



An improved Service Delivery Model through the implementation of
the FIDPM in the South African
Public Sector

2021

Neil Sirbadhoo

An improved Service Delivery Model through the implementation of
the FIDPM in the South African
Public Sector

Neil Sirbadhoo
(204509335)

A Thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy
in Construction Management in the College of Agriculture, Engineering and Science,
University of KwaZulu-Natal,
Durban,
South Africa.

Supervisor: Prof. Nishani Harinarain

December 2021

PREFACE

The research contained in this thesis was completed by the candidate while based in the Discipline of Construction Management, of the College of Agriculture, Engineering and Science, University of KwaZulu-Natal, Howard College, South Africa. The research was financially supported by the Researcher.

The contents of this work have not been submitted in any form to another university and, except where the work of others is acknowledged in the text, the results reported are due to investigations by the candidate.

Signed: Prof N. Harinarain

Date: ____

COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE

DECLARATION - PLAGIARISM

I, Neil Sirbadhoo, declare that:

1. The research reported in this thesis, except where otherwise indicated or acknowledged, is my original work;
2. This thesis has not been submitted in full or in part for any degree or examination to any other university;
3. This thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons;
4. This thesis does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then:
 - a. Their words have been re-written but the general information attributed to them has been referenced;
 - b. Where their exact words have been used, their writing has been placed inside quotation marks, and referenced;
5. This thesis does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the thesis and in the References sections.

Signed: Mr N. Sirbadhoo

Date: 27/03/2022

As the candidate's Supervisors we agree to the submission of this thesis.

Signed:

Date: _____

DECLARATION 2 - PUBLICATIONS

Details of the contribution to publications that form part and/ or include research presented in this thesis (include publications in preparation, submitted, in press and published, and provide details of the contributions of each author to the experimental work and writing of each publication).

Publication 1

Sirbadhoo, N. and Harinarain, N. (2019), Barriers Hindering the Implementation of the System for Infrastructure Procurement and Delivery Management, 13th Built Environment Conference, Association of Schools of Construction of Southern Africa, Durban, South Africa pgs. 107-116.

Publication 2

Sirbadhoo, N. and Harinarain, N. (2021), The Effective Implementation of the Framework for Infrastructure Delivery and Procurement Management, 15th Built Environment Conference, Association of Schools of Construction of Southern Africa, Durban, South Africa.

Publication 3

Sirbadhoo, N. and Harinarain, N. (2021), Implementation of Infrastructure Delivery Management Principles and Benefits in the South African Public Sector: The Project Managers Perspective, Journal of Construction, Vol 14 (01), pp 41-51.

Student: _____

Date: 27/03/2022

I dedicate this work to my,

Family & Friends

ACKNOWLEDGEMENTS

To my mother, Sherina Sirbadhoo and brother, Neshay Sirbadhoo, thank you for your guidance, support, motivation and lenience throughout my PhD study years.

To my father, Roshan Sirbadhoo, thank you for always watching over, guiding and protecting me.

To my uncle, Suren Prakash, thank you for playing a pivotal role in my professional career and academic growth. I am forever grateful for your positive influence, guidance and support.

To Sherwyn Bhana and Yuvan Naidoo, thank you for your underlying and never-ending support during my PhD study years.

Shiktar Komal and Shalen Pillay, friends who became family, lost during a difficult year, you will never be forgotten.

To my supervisor, Professor Nishani Harinarain, thank you for your guidance, support and motivation throughout the study and for sharing your knowledge and wisdom towards my research.

Sincere thanks to my colleagues for their support during my research period.

Thank you to all the built environment professionals that participated in this study.

Finally, Shane Reddy and Dr Deen Letchmiah, thank you for your never ending support and guidance.

ABSTRACT

The most important issue in South Africa remains, improving the delivery of public services, as any democratic society needs to exhibit efficient, equitable and accountable public service. Public service delivery challenges still experienced in 2021 were the same raised in previous years regarding capacity and skills shortages with public servants. The main challenge which affects infrastructure management and delivery has been the unevenness in capacity that leads to uneven performance in local, provincial and national government. Although the infrastructure delivery management system (IDMS) has made relatively good progress when implemented through provincial treasuries and provincial departments, it has not been sufficiently institutionalised in most departments. The implementation and sustainability of the IDMS stills remains a challenge. Government through National Treasury has released the Framework for Infrastructure Delivery and Procurement Management (FIDPM) as an initiative towards ensuring a systematic and structured approach for infrastructure procurement and delivery management for the successful delivery of construction projects.

The Framework for Infrastructure Delivery and Procurement Management recognises that project management plays a critical role in the delivery of public services in South Africa as all spheres of government structures implement and deliver services. While it is argued, the public sector is less innovative than the private sector, project management plays an important role towards innovative delivery approaches in public service. Arguably the main driver behind the application of project management in government is to improve state institution's ability to deliver efficient, effective and high-quality services. In the third decade of the country's post-apartheid constitutional democracy, serious concern has been raised about the government and its ability to deliver public services that its citizens are entitled to. The research aimed to develop a model to improve service delivery in the public sector. The aim was achieved through an in-depth literature review to identify factors that drive service delivery on public sector projects. Three drivers (the public sector, government policies, frameworks and the FIDPM, and project management tools and techniques), with 19 unobserved variables and 192 indicators were identified.

Through an iterative Delphi technique, a panel of experts was used to validate the factors identified in the literature review. The panel of experts reached consensus after three iterations on 160 items which were grouped under the three drivers. A conceptual model was developed based on the Delphi study. The proposed improved service delivery model was tested nationally using a self-administered survey questionnaire. Four hundred and ten responses were received. Thereafter the model was subjected to attentive multivariate analysis which included exploratory factor analysis, confirmatory factor analysis and path modelling using SPSS version 27 and Amos version 26.

The exploratory factor analysis confirmed the drivers, namely, the public sector, government policies, frameworks and the FIDPM, and PM tools and techniques for improved service delivery were valid and reliable and further showed positive and strong relationships to the respective drivers. Thereafter, the confirmatory factor analysis validated the hypothesised factors on the three drivers. Structural equation modelling analysed and assessed the hypothesised path between the drivers and dependent variables in the model for practicality and significance. Out of a total of 22 tested hypotheses, eight (36.36%) were statistically supported. These were presented in a final path diagram which depicted the relationships between the hypothesised paths were practical and significant.

The outcomes recorded in this study add to the body of knowledge on an important service delivery framework that is in its infancy of implementation in South Africa. The findings highlighted the role of the public sector and its efforts towards addressing service delivery in South Africa are alarming. However, through numerous policies and frameworks developed by government over the recent decades, service delivery challenges are still present. The implementation of the FIDPM has not yet seen any improvements to service delivery that previous policies and frameworks have failed to address. Project management has been identified as a key area of expertise that may assist government through the application of project management tools and techniques, enhance the implementation of the FIDPM towards improving service delivery on public sector projects.

Key Words: Delphi study, FIDPM, path modelling, project management, public sector, South Africa

LIST OF FIGURES

Description	Title	Page No.
Figure 1.1	Two-Stage Research Approach	8
Figure 1.2	Structure Of Thesis	12
Figure 2.1	Four Built Environment Characteristics	14
Figure 2.2	Critical Service Delivery Challenges	36
Figure 2.3	Inadequate Access To School For Learners Kwazulu-Natal, South Africa	37
Figure 2.4	Informal Settlements And Chemical Toilets Due To Lack Of Services In The Western Cape	37
Figure 2.5	Violent Service Delivery Protest In KZN	38
Figure 3.1	The Framework Governing Public Sector Procurement In South Africa	45
Figure 3.2	Timeline Of Performance Measurement Reports	48
Figure 3.3	The Infrastructure Delivery Management Process Diagram	67
Figure 3.4	FIDPM Process Flow	70
Figure 4.1	Typical Project Team Organogram	77
Figure 4.2	Overlapping Project Management Process Groups	78
Figure 5.1	The Proposed Improved Service Delivery Conceptual Model	96
Figure 5.2	Detailed Path Diagram For The Public Sector Driver	97
Figure 5.3	Detailed Path Diagram For The Government Policies, Frameworks And The FIDPM Driver	98
Figure 5.4	Detailed Path Diagram For The PM Tools And Techniques Driver	99
Figure 6.1	The Research Onion	111
Figure 6.2	The Research Process Adopted For This Study	112
Figure 6.3	Data Collection Approach For This Study	117
Figure 6.4	Sampling Techniques	119
Figure 7.1	Three Round Delphi Process	134
Figure 7.2	Delphi Panel Sampling And Response Rate.	137
Figure 7.3	Delphi Rounds	139
Figure 8.1	Drivers That Influence Service Delivery	144
Figure 9.1	The Public Sector	180
Figure 9.2	Government Policies, Frameworks And The FIDPM	188
Figure 9.3	PM Tools And Techniques	195
Figure 9.4	Scree Plot – Public Sector	217

Figure 9.5	Scree Plot – Government Policies, Frameworks And The FIDPM	224
Figure 9.6	Scree Plot – Project Management Tools And Techniques	229
Figure 9.7	Scree Plot – Project Management Tools And Techniques - Implementation Of IDM Principles And Benefits	236
Figure 9.8	The Proposed And Final Model	249
Figure 9.9	The Final Path Diagram	262

LIST OF TABLES

Description	Title	Page No.
Table 2.1	Key South African Cities	20
Table 2.2	Common Service Delivery Challenges Resulting In Delays Around The Globe	31
Table 3.1	Key Policies Governing Public Procurement	43
Table 3.2	Sipdm Review Gates	61
Table 3.3	Project Processes Work Stage Deliverables	68
Table 3.4	SIPDM Review Gates Vs. FIDPM Work Stages	71
Table 3.5	Infrastructure Procurement Gates	72
Table 4.1	Five Project Management Process Groups	78
Table 4.2	Various Project Work Stages	79
Table 4.3	Sacpcmp Project Work Stages	79
Table 4.4	SIPDM Review Gates Vs FIDPM Work Stages Vs SACPCMP Work Stages	80
Table 4.5	PM Roles And Responsibilities Under The Six Work Stages	81
Table 4.6	Skill Sets Of Effective Project Managers	84
Table 4.7	Project Management Ten Knowledgeable Areas Of Expertise	85
Table 4.8	Effective Project Management Vs. Poorly Managed Projects	87
Table 4.9	Key Project Management Value Areas In Service Delivery	90
Table 5.1	The Identified Dependent (Observed) Variable, Unobserved Variables And Indicators – The Public Sector	102
Table 5.2	The Identified Dependent (Observed) Variable, Unobserved Variables And Indicators – Government Policies, Frameworks And The FIDPM	104
Table 5.3	The Identified Dependent (Observed) Variable, Unobserved Variables And Indicators – PM Tools And Techniques	106
Table 6.1	Research Methods Assigned To Achieve Research Methods	118
Table 6.2	Emails Issued To Study Sample	121
Table 7.1	Importance And Impact Scale	139
Table 8.1	Professional Background And Experience Of Delphi Panel Of Experts	143
Table 8.2	Drivers And Factors For The Study	145
Table 8.3	Delphi Results Round 1 – The Public Sector	146
Table 8.4	Delphi Results Round 1 – Government Policies, Frameworks And The FIDPM	147

Table 8.5	Delphi Results Round 1 – PM Tools And Techniques	148
Table 8.6	Discussion Of Delphi Results Round 1	150
Table 8.7	Delphi Results Round 2 - The Public Sector	153
Table 8.8	Delphi Results Round 2 - Government Policies, Frameworks And The FIDPM	154
Table 8.9	Delphi Results Round 2 - PM Tools And Techniques	156
Table 8.10	Discussion Of Delphi Results Round 2	158
Table 8.11	Delphi Results Round 3 – The Public Sector	160
Table 8.12	Delphi Results Round 3 – Government Policies, Frameworks And The FIDPM	161
Table 8.13	Delphi Results Round 3 – PM Tools And Techniques	162
Table 8.14	Discussion Of Delphi Results Round 3	164
Table 8.15	Summary Of The Three Delphi Survey Rounds – The Public Sector	166
Table 8.16	Summary Of The Three Delphi Survey Rounds – Government Policies, Frameworks And The FIDPM	167
Table 8.17	Summary Of The Three Delphi Survey Rounds – PM Tools And Techniques	169
Table 8.18	Ranking The Importance And Impact Of All Factors	172
Table 9.1	Demographic Information Summary	178
Table 9.2	Employment Sector And Geographic Dispersion	179
Table 9.3	Racial Distribution And Experience Of Respondents	180
Table 9.4	Recurring Problems In The Public Sector	181
Table 9.5	Public Service Transformation Strategies	182
Table 9.6	Government Initiatives	183
Table 9.7	Batho Pele Principles	184
Table 9.8	Service Delivery Challenges	185
Table 9.9	Government Processes And Decision Making	186
Table 9.10	Management Strategies For Service Delivery	187
Table 9.11	Policy Development And Implementation	189
Table 9.12	Effective Policy Implementation	190
Table 9.13	SCM Public Procurement Challenges	191
Table 9.14	IDMS, SIPDM & FIDPM	192
Table 9.15	Governments Ability To Apply IDMS Principles Through The FIDPM	193
Table 9.16	Governments Ability To Apply IDMS Benefits Through The FIDPM	194
Table 9.17	Pm Attributes	196
Table 9.18	Effective Ways Of Introducing Change	197
Table 9.19	Key Skill Sets Of Effective PM's	198

Table 9.20	Ten PM Areas Of Expertise And Service Delivery Challenges	199
Table 9.21	Key Institutional Goals	200
Table 9.22	Application Of IDM Toolkits Principles By PM's	202
Table 9.23	Application Of IDM Toolkits Benefits By PM's	202
Table 9.24	Implementation Of Principles In The FIDPM Work Stages 1 - 7	206
Table 9.25	The Implementation Of Benefits In The FIDPM Work Stages 1 - 7	210
Table 9.26	KMO Measures Of Sampling Adequacy	214
Table 9.27	KMO And Bartlett's Test – Public Sector	215
Table 9.28	Communalities – Public Sector	216
Table 9.29	Total Variance Explained – Public Sector	217
Table 9.30	Pattern Matrix – The Public Sector	221
Table 9.31	KMO And Bartlett's Test – Government Policies, Frameworks And The FIDPM	222
Table 9.32	Communalities – Government Policies, Frameworks And The FIDPM	222
Table 9.33	Total Variance Explained - Government Policies, Frameworks And The FIDPM	223
Table 9.34	Pattern Matrix – Government Policies, Frameworks And The FIDPM	225
Table 9.35	KMO And Bartlett's Test – Project Management Tools And Techniques	227
Table 9.36	Communalities – Project Management Tools And Techniques	227
Table 9.37	Total Variance Explained – Project Management Tools And Techniques	228
Table 9.38	Pattern Matrix – PM Tools And Techniques	231
Table 9.39	KMO And Bartlett's Test – Project Management Tools And Techniques – Implementation Of IDM Principles And Benefits	233
Table 9.40	Communalities – Project Management Tools And Techniques - Implementation Of IDM Principles And Benefits	233
Table 9.41	Total Variance Explained – Project Management Tools And Techniques - Implementation Of IDM Principles And Benefits	235
Table 9.42	Pattern Matrix – PM Tools And Techniques - Implementation Of IDM Principles And Benefits	236
Table 9.43	Pattern Matrix For Retained Factors	242
Table 9.44	Results Of CR, AVE And Alpha Analysis	244
Table 9.45	Reliability And Validity Analysis Using AMOS	246
Table 9.46	Cut-Off Ranges For Model Fit	246
Table 9.47	Results From The Modified Model	247
Table 9.48	Model Fit For The Public Sector	250

Table 9.49	Model Parameters For The Public Sector	251
Table 9.50	Model Fit For Government Frameworks And Policies And The FIDPM	252
Table 9.51	Model Parameters For Government Frameworks And Policies And The FIDPM	252
Table 9.52	Model Fit For PMT	253
Table 9.53	Model Parameters For PM Tools And Techniques	253
Table 9.54	Model Fit For IMPP/IMPB	254
Table 9.55	Model Parameters For Implementation Of IDM Toolkits Principles And Benefits	254
Table 9.56	Leading Variable/ Driver 1 – The Public Sector	256
Table 9.57	Leading Variable/ Driver 2 – Government Policies, Frameworks And The FIDPM	257
Table 9.58	Leading Variable/ Driver 3 – PM Tools And Techniques	258
Table 9.59	Leading Variable/ Driver 3 - PM Tools And Techniques - Implementation Of IDM Toolkits Principles And Benefits	259
Table 9.60	Dependent Variable – Improved Service Delivery	259
Table 9.61	Summary Of Accepted Hypothesis	261

LIST OF TERMS

AG	Auditor General
AMOS	Analysis of Moment Structure
ANC	African National Congress
APM PMBOK	Association of Project Managers Project Management Body of Knowledge
AVE	Average Variance Extracted
B-BBEE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
CIC	Construction Industry Council
CIDB	Construction Industry Development Board
CPM	Construction Project Management
CBE	Council for the Built Environment
CESA	Consulting Engineers of South Africa
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CIOB	Chartered Institute of Building
CR	Composite Reliability
CS	Community Survey
CSSA	Computer Society SA
DPW	Department of Public Works
DBSA	Development Bank of South Africa
DG	Director General
DoRA	Division of Revenue Act
DPSA	Department of Public Service Administration
EFA	Exploratory Factor Analysis
EXCO	Executive Committee
FIDPM	Framework for Instructure Delivery and Procurement Management
FOSAD	Forum of SA Directors-General
ETQA	Education and Training Quality Assurance
GDP	Gross Domestic Product
GHS	General Household Survey
HDI	Historically Discriminated Individuals
HOD	Head of Department
IDIP	Infrastructure Delivery Improvement Programme
IDMS	Infrastructure Delivery Management System
IDM	Infrastructure Delivery Management
IDP	Infrastructure Development Plan
IMESA	Institute of Municipal engineering of Southern Africa
KMO	Kaiser-Meyer-Olkin
LISREL	Linear Structural RELationships
MAR	Missing at Random
MCAR	Missing Completely at Random
MEC	Member of the Executive Committee

MFMA	Municipal Finance Management Act
MTSF	Medium Term Strategic Framework
NDP	National Development Plan
NPC	National Planning Commission
OCPO	Office of the Chief Procurement Officer
OMF	Operations Management Framework
PAJA	Promotion of Administrative Justice Act
PFMA	Public Finance Management Act
PG	Procurement Gate
PGDS	Provincial Growth and Development Strategy
PhD	Doctor of Philosophy
PICC	Presidential Infrastructure Coordinating Commission
PMO	Project Management Office
PMDS	Performance Management and Development System
PFMA	Public Finance Management Act
PM	Project Manager
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMSA	Project Management South Africa
PPP	Public Private Partnerships
PPPPFA	Preferential Procurement Policy Framework Act
PrCPM	Professional Construction Project Manager
PRINCE2	Projects in Controlled Environments
PSC	Public Service Commission
PSP	Professional Service Providers
RDP	Reconstruction and Development Program
RIBA	Royal Institute of British Architects
RMSEA	Root Mean Square Error of Approximation
SA	South Africa
SACPCMP	South African council for the Project and Construction Management Professions
SAFCEC	South African Forum of Civil Engineering Contractors
SAICE	South African Institution of Civil Engineering
SAIEE	South African Institute of Electrical Engineers
SCM	Supply Chain Management
SD	Standard Deviation
SEM	Structural Equation Modelling
SEPATH	Structural Equation Modelling and Path Analysis
SDIP	Service Delivery Improvement Programme
SETA	Sector Education and Training Authority
SGB	Standards Generating Body
SIPDM	Standard for Infrastructure Procurement and Delivery Management
SOE	State Owned Enterprises
SMMEs	Small, Medium and Micro-Sized Enterprises
SPSS	Statistical Package for Social Sciences
SRMR	Standardised Root Mean Square Residual

Stats SA	Statistics South Africa
TVE	Total Variance Explained
UK	United Kingdom
UKZN	University of KwaZulu-Natal
USA	United States of America

TABLE OF CONTENTS

PREFACE.....	i
COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE.....	ii
DECLARATION - PLAGIARISM	ii
DECLARATION 2 - PUBLICATIONS	iii
ACKNOWLEDGEMENTS	v
ABSTRACT.....	vi
LIST OF FIGURES	viii
LIST OF TABLES	x
LIST OF TERMS.....	xiv
CHAPTER 1 – INTRODUCTION	1
1.1 Introduction.....	1
1.2 Research Background and Problem	1
1.2.1 Public Sector and Service Delivery.....	1
1.2.2 Government Policies and Frameworks for Service Delivery.....	2
1.2.3 Project Management	4
1.3 The Research Questions.....	5
1.4 Research Hypothesis	5
1.5 Aims and Objectives of the Research	7
1.6 Research Motivation and Rationale	7
1.7 Research Methodology	8
1.8 Research Significance and Originality.....	10
1.9 Research Limitations.....	11
1.10 Ethical Considerations	11
1.11 Structure of the Thesis	11
1.12 Summary	13
CHAPTER 2 – LITERATURE REVIEW: THE SOUTH AFRICAN PUBLIC SECTOR AND SERVICE DELIVERY CHALLENGES IN THE CONSTRUCTION INDUSTRY	14
2.1 Introduction.....	14
2.2 The Public Sector in the Built Environment	14
2.2.1 The Built Environment in South Africa.....	14
2.2.2 The Public Sector	16
2.2.3 The Public Sector in South Africa	17
2.2.4 The Importance of Public Service Delivery.....	19
2.2.5 The contribution of Cities to the Economy and Development through Service Delivery 19	
2.2.6 Public Sector Inefficiencies	21

2.3	Public Service Delivery and its Challenges in the Construction Industry	23
2.3.1	Public Sector Service Delivery	24
2.3.2	History of Service Delivery in South Africa.....	25
2.3.4	Public Sector Service Delivery Objectives in South Africa.....	27
2.3.4.1	The White Paper on the Transformation of the Public Service.....	28
2.3.4.2	Project Batho Pele.....	29
2.3.4.3	The Code of Conduct for Public Servants.....	29
2.3.4.4	South African Public Service alignment with International Standards.....	30
2.3.5	Service Delivery Challenges and Barriers to its Successful Implementation	31
2.3.5.1	Service Delivery Challenges around the Globe	31
2.3.5.2	Service Delivery Challenges in South Africa	32
2.3.5.3	Service Delivery Challenges in the Construction Industry	34
2.3.5.4	Impacts of the Covid-19 Outbreak on the South African Construction Industry and Public Sector Performance.....	40
2.4	Chapter Summary	41
CHAPTER 3 – LITERATURE REVIEW: GOVERNMENT POLICIES, FRAMEWORKS AND THE FIDPM		42
3.1	Introduction.....	42
3.2	Government Policies and Frameworks	42
3.2.1	Public Sector Policies in South Africa.....	42
3.2.2	Implementing Service Delivery through Public Procurement	44
3.2.3	Public Procurement Challenges in South Africa.....	46
3.2.4	Historic Overview of Challenges in Implementing Key Frameworks and Policies.....	47
3.2.4.1	Compliance with Batho Pele – 1999/ 2004.....	48
3.2.4.2	Public Service Commission - Evaluation of Service Standards in the Public Service - 2005	49
3.2.4.3	Public Service Commission - Evaluation of Service Standards in the Public Service – 2009/ 2010	50
3.2.4.4	The Crisis of the South African Public Service - 2014.....	50
3.2.4.5	Public Service Commission – Annual Report for 2014/ 2015	52
3.2.4.6	Statistics South Africa – Annual Service Delivery Improvement Plan Progress Report 2015/ 2016 – 2017/ 2018	52
3.2.4.7	Department of Public Service and Administration - Annual Report for 2017/ 2018....	53
3.2.4.8	Public Service Commission – Performance Management and Development System – 2018	54
3.2.4.9	Statistics South Africa – Annual Service Delivery Improvement Plan Progress Report 2018/19 – 2020/21	56
3.3	Eliminating Barriers to Improve Engagement in Public Sector	57
3.4	The Standard for Infrastructure Procurement and Delivery Management (SIPDM) and	59

3.4.1	The SIPDM	59
3.4.2	The SIPDM as Component of the Infrastructure Delivery Management System (IDMS)	61
3.4.3	Service and Infrastructure Delivery Challenges Still Present	63
3.5	The Framework for Infrastructure Delivery and Procurement Management (FIDPM).....	65
3.5.1	SIPDM Review: Critical Areas of Misalignment with Existing Relevant Policies	65
3.5.2	Scope of the Framework (FIDPM)	66
3.5.3	Framework for Infrastructure Delivery	66
3.5.4	The FIDPM Project Processes and Gateway Reviews.....	67
3.5.5	Framework for Infrastructure Procurement	71
3.5.6	Performance Measurement of the FIPDM in the Public Sector.....	73
3.6	Chapter Summary	73
CHAPTER 4 – LITERATURE REVIEW: PROJECT MANAGEMENT IN THE BUILT ENVIRONMENT		74
4.1	Introduction.....	74
4.2	Background and Project Environment	74
4.3	The Project Management Profession	74
4.3.1	Project Management in South Africa.....	75
4.3.2	Construction Consultants and the Project Manager in the Built Environment	76
4.3.4	The Project Managers Role in the Project Life Cycle.....	80
4.4	Project Management Tools and Techniques	82
4.4.1	PM Attributes.....	83
4.4.2	Key Skillsets of Effective PMs	83
4.4.3	Effective Ways of Introducing Change.....	84
4.4.4	Ten PM Areas of Expertise.....	84
4.5	The Benefits of Project Management.....	85
4.6	The Importance of Project Management.....	86
4.7	Project Management and its Role Towards Addressing Service Delivery Challenges.....	88
4.8	Chapter Summary	91
CHAPTER 5 – CONCEPTUAL MODEL FOR IMPROVED SERVICE DELIVERY IN THE PUBLIC SECTOR		92
5.1	Introduction.....	92
5.2	A Conceptual Model in Research	92
5.3	The Modelling Approach Adopted in this Study	93
5.4	The Selection of the Dependant Variable	100
5.5	Hypotheses to be Tested	109
5.6	Chapter Summary	110
CHAPTER 6 – RESEARCH METHODOLOGY		111

6.1	Introduction.....	111
6.2	Research Exemplified	111
6.3	Research Process.....	111
6.3.1	Research Paradigms	112
6.3.2	Research Approach/ Design.....	113
6.3.3	Methodological Choice	114
6.3.4	Research Strategies and Designs.....	115
6.3.5	Time Horizons	116
6.3.6	Data Collection Methods	116
6.4	Sampling	118
6.4.1	Probability Sampling.....	119
6.5	Survey Questionnaire.....	122
6.5.1	Pilot Study.....	123
6.5.2	Instrument Administration	123
6.6	Data Analysis	124
6.6.1	Data Screening/ Cleaning and Preparation of the National Survey Questionnaire	124
6.6.1.1	Sample Size.....	125
6.6.1.2	Missing Data	125
6.6.1.3	Univariate and Multivariate Normality	126
6.6.1.4	Outliers.....	126
6.6.1.5	Item Parcelling	127
6.6.2	Structural Equation Modelling and Path Modelling	127
6.6.2.1	Structural Equation Modelling.....	127
6.6.2.2	Path Modelling.....	128
6.7	Reliability and Validity	130
6.7.1	Reliability.....	130
6.7.2	Validity	130
6.8	Ethical Considerations	131
6.9	Summary	132
CHAPTER 7 – DELPHI STUDY.....		133
7.1	Introduction.....	133
7.2	The Delphi Technique.....	133
7.3	Steps in a Delphi Study.....	134
7.3.1	The Research Question	135
7.3.2	The Research Design	135
7.3.3	The Research Sample.....	135
7.3.3.1	The Qualifications of Experts	135

7.3.3.2	The Panel Size.....	136
7.3.3.3	The Number of Rounds.....	137
7.3.4	Delphi Round One Questionnaire Design.....	138
7.3.5	Delphi Pilot Study.....	139
7.3.6	Round One Questionnaire Survey and Analysis.....	140
7.3.7	Delphi Round Two Questionnaire Design.....	140
7.3.8	Round Two Questionnaire Survey and Analysis.....	140
7.3.9	Delphi Round Three Questionnaire Design.....	140
7.3.10	Round Three Questionnaire Survey and Analysis.....	140
7.3.11	Verification, Analysis and Reporting the Research Results.....	141
7.3.11.1	Reliability and Validity of the Delphi Method.....	141
7.3.11.2	Minimising the Effects of Bias.....	141
7.4	Summary.....	142
CHAPTER 8 – RESULTS OF THE DELPHI STUDY.....		143
8.1	Introduction.....	143
8.2	Demographic and Geographic Information of Delphi Panellists.....	143
8.3	Results of the Delphi Study.....	143
8.3.1	Round One.....	144
8.3.2	Round Two.....	153
8.3.3	Round Three.....	159
8.3.4	Ranking of Factors.....	172
8.3.4.1	Public Sector.....	173
8.3.4.2	Government Policies, Frameworks and the FIDPM.....	174
8.3.4.3	PM Tools and Techniques.....	174
8.4	Chapter Summary.....	174
CHAPTER 9 – DATA ANALYSIS.....		176
9.1	Introduction.....	176
9.2	Descriptive Data Analysis.....	177
9.2.1	Reliability Analysis – Cronbach Alpha.....	178
9.2.2	Demographic Information.....	178
9.2.3	The Public Sector.....	180
9.2.3.1	Summary of Findings – The Public Sector.....	187
9.2.3.2	Skewness and Kurtosis.....	187
9.2.4	Government Policies, Frameworks and the FIDPM.....	187
9.2.4.1	Summary of Findings – Government Policies, Frameworks and the FIDPM.....	194
9.2.4.2	Skewness and Kurtosis.....	195
9.2.5	Project Management Tools and Techniques.....	195

9.2.5.1	Summary of Findings – PM Tools and Techniques.....	211
9.2.5.2	Skewness and Kurtosis.....	212
9.3	Exploratory Factor Analysis Results.....	213
9.3.1	Dimension Reduction Process	213
9.3.2	The Public Sector	214
9.3.3	Government Policies, Frameworks and the FIDPM	222
9.3.4	Project Management Tools and Techniques	226
9.3.5	Pattern Matrix	241
9.3.6	Reliability and Validity	243
9.4	Confirmatory Factor Analysis Results (CFA).....	244
9.4.1	Initial Model and Adjustments.....	245
9.4.2	Model Fit.....	246
9.4.3	Fit Indices and Estimates for Leading Drivers.....	250
9.4.3.1	The Public Sector	250
9.4.3.2	Government Frameworks and Policies and the FIDPM.....	251
9.4.3.3	Project Management Tools and Techniques	252
9.4.3.4	Implementation of IDM toolkits principles and benefits in FIDPM work stages (IMPP/IMPB).....	253
9.4.4	Proposed Hypothesis.....	255
9.4.4.1	Hypothesis Analysed.....	256
9.4.4.2	Hypotheses Summary and Discussion	260
9.5	Chapter Summary	271
CHAPTER 10 – CONCLUSIONS AND RECOMMENDATIONS		272
10.1	Introduction.....	272
10.2	Summary of the Literature and Contribution to the Body of Knowledge.....	272
10.3	Research Question, Aims and Objectives	274
10.3.1	Theoretical objectives	274
10.3.2	Empirical Objectives.....	275
10.4	Recommendations.....	275
10.4.1	Recommendations to the Public Sector.....	275
10.4.2	Recommendation for government policies, frameworks and the FIDPM.....	276
10.4.3	Recommendations to PMs	276
10.4.4	Recommendations for Further Research.....	277
10.5	Summary	278
REFERENCES		279
APPENDIX A – UKZN ETHICAL CLEARANCE LETTER		
APPENDIX B – DELPHI INVITATION LETTER AND QUESTIONNAIRE		

APPENDIX C – SACPCMP COUNCIL DATABASE APPROVAL LETTER

APPENDIX D – NATIONAL SURVEY COVER LETTER

APPENDIX E – NATIONAL SURVEY QUESTIONNAIRE

APPENDIX F – RESEARCH PUBLICATIONS

APPENDIX G – SKEWNESS AND KURTOSIS TABLES

APPENDIX H – FIDPM WORK STAGES 1-7 TABLES

CHAPTER 1 – INTRODUCTION

1.1 Introduction

Chapter 1 introduces the research topic of the South African public sector, government policies, frameworks and the FIDPM including project management tools and its role towards assisting government improve service delivery through the implementation of the FIDPM. Thereafter, the research problem is brought to light which leads into the formulation of the research question. In addition, the chapter presents the research aims and objectives including the adopted research methodology. The chapter draws to a close by discussing the research signification and originality and limitations are outlined, and finally the structure of the study is presented.

1.2 Research Background and Problem

1.2.1 Public Sector and Service Delivery

The South African built environment measures progress physically in terms of construction and development, supplying clean water and effective sanitation, including stable electricity to households (Freund, 2010). Physical progress of construction is usually implemented through the construction industry. The construction industry forms part of the built environment and plays an integral role to the economy, by providing critical infrastructure essential to the continuous growth and development of the country (Muir and Rance, 1995). Economic stimulation is achieved through infrastructure service delivery via the private and public sectors (National Treasury, 2020).

The public sector is a fundamental part of government, involves the welfare of society and leads the facilitation of service delivery in the construction industry and built environment (Public Service Act, 1994). An efficient and effective public sector relates to the manner in which it maximises resources in relation to outputs achieved (Mihaiu, Opreana and Cristescu, 2010). Governments service delivery successes or failures depend on the economic policies, government decision making capabilities and intentions on producing ideal output (Schiller, 1993).

In South Africa, improving the delivery of public services remains a priority, as any democratic society needs to exhibit efficient, equitable and accountable public service (Toor, Ogunlana, and Ofori, 2012). The South African government has placed infrastructure spending and delivery as the centre of its economic growth strategy (Mashamaite, 2014). In the global context and with its oppressive history, South Africa has had to play catch up in dealing with unemployment, poor economic growth, underdevelopment, poverty and inequality (Chen, Dean, Frant and Kumar, 2014). The South African public service has undergone numerous phases since the country's democracy post 1994

(Nengwakhulu, 2009). The performance and delivery of services to the public has not matched the positive intent of policy makers (Kanyane, 2014; Mashamaite, 2014).

South Africa's service delivery legislature, policy and guidelines are in accordance with international best practice requirements (World Bank, 2015). However, in the third decade of the country's post-apartheid constitutional democracy, grave concern has been raised about the government's ability to deliver public services (Khumalo, Choga and Munapo, 2017). Fakir (2014) and Beukes (2014) highlight governments ability to provide reliable and consistent service delivery to citizens are hindered by incompetent public servants, a lack of accountability, poor human resources practices, inadequate procurement practices and a lack of leadership. In addition, key problem areas include service delivery difficulties, poor management of finances, high level of unemployment, nepotism, and corruption (Akinboade, Kinfaek and Mokwena, 2013). The public sector exhibits service delivery challenges which are underpinned by three key areas of influence, political issues, policy issues and implementation issues (Ngcamu, 2019; Public Service Act, 1994).

In 2002, National Treasury conducted a review of provincial service delivery systems with the intention to enhance infrastructure delivery. From this review, a key recommendation emerged which required a framework to be developed to guide and structure the management of infrastructure delivery. As a result, the concept of the Infrastructure Delivery Management System (IDMS) was developed and later adopted as the chosen government wide system for infrastructure delivery (FIDPM, 2019). Indicating governments initiative towards improving service delivery in the country.

1.2.2 Government Policies and Frameworks for Service Delivery

The importance of the public sector's capability to successfully provide infrastructure service delivery to the public underpins the platform upon which society depends and yet in many cases the causes of infrastructure failure can be traced back to a lack of good governance, poor procurement, and inadequate delivery management practices, all of which are under the control of government departments. The role of government departments is crucial in terms of setting the direction and providing effective governance (Watermeyer, 2018).

Public service policies since the new government came to power in 1994 have attempted to deal with the complex needs of the service delivery institutions including service delivery itself and had to be done against the background of the unfortunate legacies of the past (White Paper on Transforming Public Service Delivery, 1999). Public service and service delivery policies were designed and promulgated to deal with the simultaneous transformation and quest for improved, service delivery orientated public service in South Africa (Schwella, 2001). The most important public service delivery

policies and initiatives implemented in South Africa are: The Constitution and Public Administration, The White Paper on the Transformation of the Public Service, Project Batho Pele, The Code of Conduct for Public Servants.

In South Africa, procurement is of particular importance in the public sector and has been used as a policy tool due to inequitable and unfair practices which transpired during apartheid (Bolton, 2006; Cane, 2004). Public procurement refers to government activity of purchasing the goods and services needed to perform its functions through contractual means (Arrowsmith, 2010; Odhiambo and Kamau, 2003). In addition, public procurement has since been granted constitutional status and is a recognised means of addressing past discriminatory policies and practices (Bolton, 2006). South Africa has subsequently become known for its use of procurement preferences as affirmative action to advance the economic status of groups who had suffered discrimination under apartheid (National Treasury, 2016). Recent policy developments have been aimed at placing greater support on public procurement as a tool for achieving economic transformation and addressing socio-economic inequalities deriving from South Africa's pre-democratic past (Davey and Gatenby, 2017). However, South African public procurement implementation too, has its challenges.

Supply Chain Management (SCM) is a fundamental part of procurement in the public sector and is used as a tool for the management of public procurement practices (National Treasury, 2003; Office of Governance and Commerce, 2005). However, there are challenges in public procurement, namely: a lack of proper knowledge, skills and capacity including non-compliance with SCM policy and regulations (Hanks, Davies and Perera, 2008). Inadequate planning, no accountability, fraud and corruption (Ambe and Badenhorst-Weiss, 2012). Unethical behaviour, decentralisation of the procurement system, and the ineffectiveness of the black economic empowerment (BEE) policy (Handfield, Monczka, Guinipero and Patterson, 2011).

In 2004 the Infrastructure Delivery Improvement Programme (IDIP) was established in a partnership with National Treasury, the Construction Industry Development Board (CIDB), the Department of Public Works (DPW) and the Development Bank of South Africa (DBSA) to create a capacity building programme dealing with service delivery failures across provincial departments and were the concept of the Infrastructure Delivery Management System (IDMS) was developed (IDMS, 2014). The IDMS is government's policy for implementing its strategy to enhance socio-economic growth and development through infrastructure delivery (IDMS, 2019). Although the IDMS has made some good progress when implemented through provincial treasuries and provincial departments, it has not been sufficiently institutionalised in most departments. The implementation and sustainability of the IDMS remains a challenge (National Treasury, 2019).

Service delivery in the South African construction industry post 1994 has seen its challenges over the years (Ngcamu, 2019). The government has developed and implemented numerous policies and frameworks to facilitate service delivery in the construction industry (Khumalo *et al.* 2017). To date, there are still unresolved service delivery challenges (Masiya David and Mangai, 2019). As a result, government through National Treasury has released the Framework for Infrastructure Delivery and Procurement Management (FIDPM) in October 2019 as an initiative towards ensuring a systematic and structured approach for infrastructure procurement and delivery management for the successful delivery of construction projects (FIDPM, 2019). The FIDPM further recognises that project management plays a critical role in the delivery of public services in South Africa as all spheres of government structures implement and deliver services (FIDPM, 2019).

1.2.3 Project Management

The South African council for the Project and Construction Management Professions (SACPCMP) governs the construction and project management professions in the country (SACPCMP, 2000). Project management entails the application of knowledge skills, tools and techniques to project activities to meet the project requirements (PMBOK, 2021). Experience has proven that the selection of the project manager is an important appointment which can influence the success or failure of the project (Burke, 2019). As the single point of responsibility, the PM integrates and co-ordinates all the contributions and guides them to successfully complete the project (PMBOK, 2017).

The implementation of effective project management to achieve successful project outcomes involves the selection and application of important project management tools and techniques (PMBOK, 2021). While there exists an array of various PM tools and techniques available for PMs to select from, the PMBOK (2017) highlights, PMs need to be familiar with the tools and techniques required for a project and effectively adapt and apply them.

The significance of project management is regarded as a foundation for any institutions responsible for rendering services to the public or customers. A project is a vehicle for service delivery and project management is a strategic tool available at any organisations disposal to enhance productivity or service delivery (Knipe, Van der Walt, Van Niekerk, Burger and Nell, 2016). Project management plays an important role towards innovative delivery approaches in public service (Pollitt and Bouckaert, 2000). The fundamental driver behind the application of project management in government is to improve state institution's ability to deliver efficient, effective and high-quality services (Srivannaboon and Milosevic, 2006). Project management is able to support the achievement of institutional goals and provide greater assurance to stake holders that the resources are effectively managed as project managers vest responsibility, authority, and accountability (Hobs, 1993; Larson, 2004; Thiry and Matthey, 2005).

Service delivery implementation has been a problem and a serious challenge in South Africa since the country's democracy in 1994. Over 27 years of policy development and implementation through government, service delivery challenges are ever present. Government has released the FIDPM as an initiative towards addressing service delivery challenges. Since the implementation of the FIDPM on 01 October 2019, real time performance of its application is developing. As a result, it is critical for government to ensure all necessary precautions have been taken (based on decades of consistent service delivery challenges) to ensure the FIDPM's successful implementation.

This study investigated the implementation of the FIDPM and PMs ability to apply infrastructure delivery management tools and techniques the IDMS offers through the implementation of the FIDPM during the project management processes towards assisting government improve public sector service delivery. This allowed a rich and valuable contribution to the academic body of knowledge as outcomes of performance are captured and reported on as they occurred, specifically during the covid-19 global pandemic.

1.3 The Research Questions

The key research question is stated as:

How will the drivers that signify the development of a model assist the South African government effectively implement the FIDPM towards improved service delivery?

The key question is further unpacked as follows:

1. What extent is the public sector in its current state affecting service delivery through institutional policy implementation given the considerations of the FIDPM and the implications of utilising project managers to enhance service delivery goals?
2. What factors drive successful service delivery in the construction industry?
3. How can these factors be implemented in a conceptual model to improve service delivery?
4. Does the proposed structural model display a perfect fit?
5. Finally, does the hypothesised path between the identified drivers and dependent variables in the proposed structural model display practical and statistical significance?

1.4 Research Hypothesis

The 22 hypothesised relationships between the variables to consider for the conceptual model for improved service delivery are stated:

Leading Variable/ Driver 1 – The Public Sector

- H₁: A positive relationship is predicted between *Recurring Problems in the Public Sector* and the public sector.
- H₂: A positive relationship is predicted between *Public Service Transformation Strategies* and the public sector.
- H₃: A positive relationship is predicted between *Government Initiatives* and the public sector.
- H₄: A positive relationship is predicted between *Batho Pele Principles* and the public sector.
- H₅: A positive relationship is predicted between *Service Delivery Challenges* and the public sector.
- H₆: A positive relationship is predicted between *Government Processes and Decision Making* and the public sector.
- H₇: A positive relationship is predicted between *Management Strategies for Service Delivery* and the public sector.

Leading Variable/ Driver 2 – The FIDPM

- H₈: A positive relationship is predicted between *Policy Development and Implementation* and the FIDPM.
- H₉: A positive relationship is predicted between *Effective Policy Implementation* and the FIDPM.
- H₁₀: A positive relationship is predicted between *SCM Public Procurement Challenges* and the FIDPM.
- H₁₁: A positive relationship is predicted between *IDMS, SIPDM & FIDPM* and the FIDPM.
- H₁₂: A positive relationship is predicted between *Government Ability to Apply the FIDPM* and the FIDPM.

Leading Variable/ Driver 3 – PM Tools and Techniques

- H₁₃: A positive relationship is predicted between *PM Attributes* and PM tools and techniques.
- H₁₄: A positive relationship is predicted between *Effective Ways of Introducing Change* and PM tools and techniques.
- H₁₅: A positive relationship is predicted between *Skill Sets of Effective PM's* and PM tools and techniques.
- H₁₆: A positive relationship is predicted between *Ten Areas of Expertise and Service Delivery Challenges* and PM tools and techniques.
- H₁₇: A positive relationship is predicted between *Key Institutional Goals* and PM tools and techniques.
- H₁₈: A positive relationship is predicted between *Application of IDM Toolkits Principals and Benefits by PM's* and PM tools and techniques.
- H₁₉: A positive relationship is predicted between *Implementation of IDM Toolkits Principals and Benefits in FIDPM Work Stages* and PM tools and techniques.

Dependent Variable – Improved Service Delivery

H₂₀: A positive relationship is predicted between *The Public Sector* and improved service delivery.

H₂₁: A positive relationship is predicted between *The FIDPM* and improved service delivery.

H₂₂: A positive relationship is predicted between *PM Tools and Techniques* and improved service delivery.

The research aims and objectives are discussed next.

1.5 Aims and Objectives of the Research

The aim of the research was to establish empirically the factors that drive service delivery as part of a model to assist the South African government effectively implement the FIDPM towards improved service delivery.

The research objectives to be achieved involved theoretical and empirical objectives:

Theoretical objectives entail:

1. An in-depth analysis and discussion of the current body of knowledge regarding:
 - The public sector in the built environment and construction industry
 - Service delivery challenges and its related impacts.
 - Government policies, frameworks and the FIDPM,
 - The construction project management profession and its tools and techniques for driving service delivery in South Africa.
2. Develop a conceptual model to effectively improve service delivery in the South African public sector.
3. Identify and determine the factors which drive service delivery in the public sector, through an iterative Delphi approach.

Empirical objectives involve:

1. To test and validate the structural model for a perfect fit,
2. Assess practical and statistical significance of the hypothesised path between the drivers and dependent variables in the conceptual model.

1.6 Research Motivation and Rationale

The motivation and rationale behind the research stemmed from decades of poor service and infrastructure delivery experienced on public sector construction projects within the built environment and construction industry. These challenges include delays in the completion of public sector projects from inception through to close out. Government has developed and implemented numerous policies and frameworks over the years to address the challenges of service delivery in the construction industry.

With the implementation of the most recent framework in 2019, the FIDPM, service delivery challenges are still present. As a result, the research aims to identify the barriers hindering the successful implementation of the FIDPM including PMs ability to apply infrastructure delivery management tools and techniques towards improving service delivery on public sector construction projects.

1.7 Research Methodology

A research approach was implemented to achieve the objectives of the study:

1. An in-depth literature review to identify the factors that drive service delivery as part of a model to assist the South African government effectively implement the FIDPM towards improved service delivery.
2. Developing a conceptual model based on the literature review,
3. A Delphi study with a panel of experts involving three iterations to validate the factors identified in the conceptual model.
4. Validating the model through the implementation of a self-administered survey questionnaire,
5. Using path modelling to identify the best fit for the improved service delivery model.

This study was implemented through a two-stage approach highlighted in Figure 1.1.

- Stage one entailed establishing a need for the study through an in-depth literature review, developing a conceptual model and the development of the research questions.
- Stage two involved a Delphi study, conducting a national survey questionnaire and thereafter analysing and modelling the results to determine the model best fit.

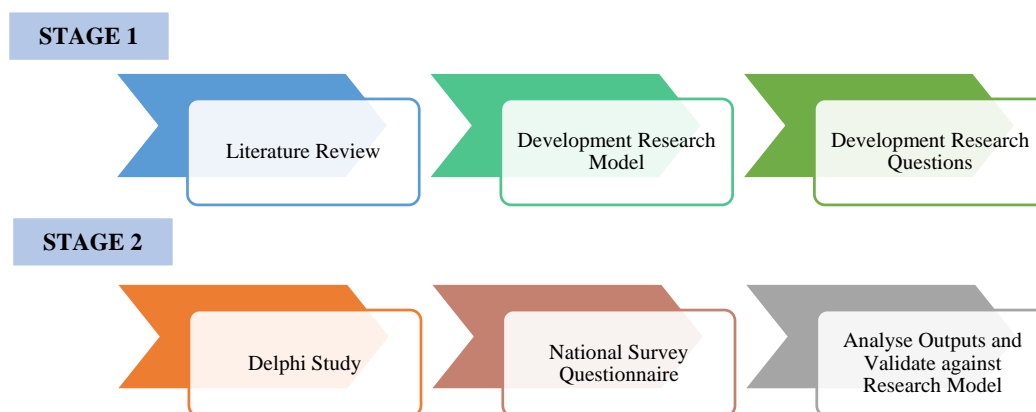


Figure 1.1: Two-stage Research Approach

In addition, the research approach applied included the following research methods:

Literature Review

A detailed literature review was used in this study to:

- Investigate the role of the public sector in the built environment including the challenges hindering service delivery.
- Understand the government frameworks and policies developed to address service delivery with specific reference to the FIDPM and its implementation on public sector projects.
- Review the PM tools and techniques that can be utilised towards addressing service delivery challenges.

Conceptual Model

The in-depth literature review was used to develop a conceptual model to improve service delivery in the public sector through the development of a path diagram adapted from path modelling. The conceptual model included key drivers (leading variables) and observed variables which was further tested through a Delphi study and through the national survey questionnaire.

Delphi Study

The Delphi method uses a process of iteration to collect and distil judgments of experts through utilising a series of questionnaires combined with feedback. Thereafter questions are designed based on the research gaps identified in literature of the study. Each questionnaire is developed from the questionnaire of the previous round and the process iterated through controlled feedback ends when consensus is achieved (Grime and Wright, 2016; Dodohoe, Stelfson and Tenant, 2012; Yang, Zeng and Zhang, 2012; Skinner, Nelson, Chin and Land, 2015). An expert panel was identified to participate in the Delphi study. The Delphi method was used in this study as it exhibits flexibility in its use through structuring anonymous group communication in order to facilitate problem solving and to structure models. The Delphi study data was analysed using Microsoft Excel.

Questionnaire

Through the results obtained from the Delphi study a robust questionnaire was developed. This research employed a quantitative study in which online questionnaires were distributed through the SACPCMP database. This allowed for a large amount of data to be collected from a sizeable population in very economical way. The survey allowed quantitative data to be collected and analysed quantitatively using descriptive and inferential statistics. The SACPCMP database was utilised to identify the sample frame. The data was analysed for the assessment of internal consistency and standard deviation using IBM SPSS Version 27.

Structural Equation Modelling

SEM is a multivariate method used by researcher to assess the reliability and validity of the model measures. Its aim is to determine the extent to which the conceptual model is supported by sample data. If the sample data is supported, then more complex theoretical models may be hypothesized. The

conceptual model is tested through SEM using a scientific method of hypothesis testing with the aim of advancing our understanding of complex relationships amongst constructs. It does this by combining factor analysis and multiple regression analysis and is used to analyse the structural relationship between measured variables and latent constructs (Pallant, 2020; Tabachnick and Fidell, 2019 and Hair et al. 2018). Path modelling was selected because it estimates the multiple and interrelated dependence in a single analysis. Furthermore, it entailed the study of the observed variables in this study and the hypothesised casual relationships were tested among the conceptual constructs using Amos version 26.

1.8 Research Significance and Originality

This research seeks to establish a link between the factors (such as the public sector, government policies, frameworks and the FIDPM and project management tools and techniques) that drive service delivery and the South African government towards effectively implementing the FIDPM towards improved service delivery on public sector construction projects.

The research further presents the integration between the drivers in a practical and significant way through the research findings from the literature review, conceptual model, Delphi study, survey questionnaires and model fit validation that portrays the relationship between the FIDPM, the challenges hindering its implementation and improving the delivery of public sector construction projects.

Furthermore:

- The research studies the implementation of a new government framework that has not been explored well in construction literature in South Africa during a global pandemic, covid-19, which adds to the uniqueness of the study, as the performance measurement of the framework was not executed under “normal” economic conditions in the country.
- It further aims to add a valuable contribution to construction literature, construction professionals and government officials through identifying the drivers for improved service delivery public sector construction projects.
- A study conducted by Rust and Koen (2011) further revealed that the South African construction industry is renowned for low levels of innovation towards stimulating technological solutions to provide and maintain future growth of the industry.
- As a result, the research will propose an innovative structural model that government officials could utilise to ensure that the FIDPM is implemented successfully through the use of project management tools and techniques during public sector construction projects in the built environment. The implementation of the proposed model is expected to have positive impacts in assisting government improve service delivery through the effective application of the FIDPM.

1.9 Research Limitations

This study was limited to:

- Professionally registered construction project managers (PrCPMs) with the SACPCMP.
- The most active service delivery and policy implementation provinces identified by the Cities Network Report, namely, KwaZulu-Natal, Gauteng and the Western Cape.
- The covid 19 pandemic could have negatively impacted the national survey questionnaire response rate.

1.10 Ethical Considerations

Ethical considerations of research concern the level of appropriateness of the researcher behaviours in relation to the rights of the subjects of the research affected by the research (Saunders et al. 2019).

This study ensured that cautious attention and consideration was given to ethical issues which was reinforced for both Delphi and national questionnaire via email, verbally and telephonically that all questionnaire respondents private and confidential information through the research will be treated with the strictest confidence. An informed consent letter was signed by participants ensuring that they understood the research being carried out including how the results will be implemented in order to allow them to make a choice on participation. In addition, ethical clearance was obtained through the University of KwaZulu-Natal research office.

1.11 Structure of the Thesis

Figure 1.1 presents the structure of the thesis.



Figure 1.2: Structure of Thesis

1.12 Summary

This chapter discussed the background and problem to the research including the research question, hypothesis and, aims and objectives. The motivation and rationale were briefly discussed and the research methodology for the study outlined. Thereafter the chapter presented the research significance and originality and drew close with the limitations and ethical considerations.

CHAPTER 2 – **LITERATURE REVIEW:** THE SOUTH AFRICAN PUBLIC SECTOR AND SERVICE DELIVERY CHALLENGES IN THE CONSTRUCTION INDUSTRY

2.1 Introduction

This chapter lays the foundation of the research by introducing the first key factor of discussion, the South African public sector. The chapter provides an in-depth review of the public sector, its role in the built environment globally and in the South African construction industry including its contribution through service delivery towards the growth and development of the country's economy. In addition, the chapter further develops by discussing legislative measures governing the drive for public service delivery and reviews the current state of the public sector, its inefficiencies and challenges hampering the delivery of services to South African citizens.

2.2 The Public Sector in the Built Environment

2.2.1 The Built Environment in South Africa

The built environment refers to the human made surroundings which provide a setting for human activity, ranging in scale from buildings and parks or green space to neighbourhoods and cities that can often include their supporting infrastructure, water supply and energy networks (Bartuska, 2007).

Bartuska and McClure (2007:5) further define the built environment as: *“a material, spatial and cultural product of human labour that combines physical elements and energy in the forms of living, working and playing”*. Figure 2.1 presents four characteristics of the built environment.

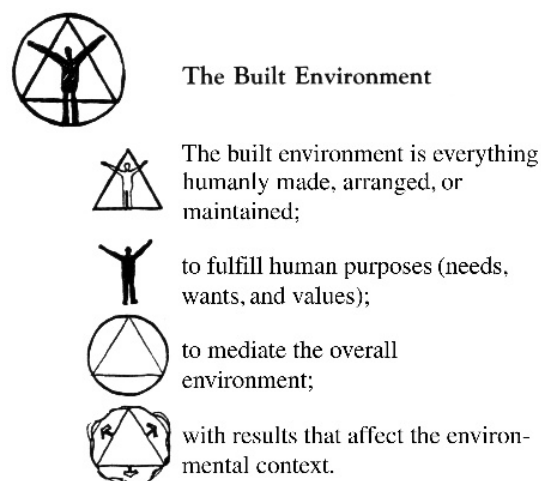


Figure 2.1: Four Built Environment Characteristics (Bartuska and McClure 2007:5)

Progress in the South African built environment is generally a physical measure in terms of new houses constructed and the supply of clean water and sanitation including electricity to households (Charles and Kibert, 1999; Freund, 2010; Wilkinson, 2008).

The construction industry which forms part of the built environment plays a key role in the economy and provides infrastructure critical to the continuous development of the country (Muir and Rance, 1995). This is supported by National Treasury (2020) who highlights the construction industry is an important stimulator for economic growth. Through the public and private sectors, economic stimulation is achieved through increasing the productive capacity of the economy via infrastructure (South African Government News Agency, 2017). Furthermore, the built environment in South Africa is regulated by the Council for the Built Environment (CBE) which identifies the built environment as the field in which registered persons' such as architects, project managers, quantity surveyors and engineers' practice (Council for the Built Environment Act, 2000).

Protection from the elements, privacy and security are fundamental for human survival, dignity and social stability which are important based on the number of people lacking shelter and access to essential services (Muir and Rance, 1995). The history of forced removals, shack clearances, sterile dormitory communities, mass hotels and inadequate services in the country helps explain both the priority given to the construction of houses after the end of apartheid (Muller, 2010).

Pressure on the built environment post 1994 (end of apartheid) in the development of cities and towns as key infrastructure nodes was more intense than elsewhere in the country, as a result stronger population and economic growth is reflected in the expansion of informal settlements (South African Cities Network Report, 2016). The public sector in cities and towns do not plan and manage this growth effectively due to a lack of capacity, resources, technical expertise and political will (Cross, 2010; Freund, 2010; Sinclair-Smith and Turoks, 2011; Wilkinson, 2008).

Samuel, Motala and Valley (1980) describe apartheid as an ideology that was supported by the National Party (NP) government which was introduced in South Africa in 1948. The Afrikaans meaning translated means "apartness" and entailed separate development of different race groups in South Africa (Group Areas Act, 1966).

The public sector is an integral part of government and is the lead facilitator and supplier in the delivery of services in the construction industry and built environment (Public Service Act, 1994). The next section discusses the public sector in South Africa.

2.2.2 The Public Sector

Generally, the public sector comprises governments, all publicly controlled and funded agencies, enterprises and other entities which delivery programs, goods and services to the public (Public Service Act, 1994). According to the Institute of Internal Auditors (2011) public sector organisations exist at any of four levels:

1. International - multistate entities and partnerships,
2. National - an independent state,
3. Regional - Province or state within a national state and
4. Local - municipal level body such as a city.

This is supplemented by the Public Service Act (1994) which identifies that the public sector provides for the organisation and administration of the public service, the regulation of the conditions of employment, terms of office and discipline and finally retirement and discharge members of the public service. The public sectors mandate involves the general welfare of society which entails the delivery of public goods and services to individuals, private and other public sector organisations, making it a critical role player in the country and global economy (Linna, Pekkola, Ukko and Melkas, 2010). In addition, Bjork, Szucs and Harenstam (2014) note that the public sector has a vast array of stakeholders, with their own interests, resulting in a variety of expectations being imposed on the public sector. In order to address the needs and expectations of all stakeholders, the public sector needs to be effective and efficient in fulfilling its responsibilities.

Mihaiu, Opreana and Cristescu (2010) emphasise that the public sectors efficiency and effectiveness relates to the way it maximises resources in relation to outputs achieved. This indicates that the public sector needs to provide public goods and services in a way that responds adequately to the needs of its stakeholders in a continuously changing environment. In order to effectively undertake this, the public sector has to reform (Gabel-Shemueli and Capell, 2013).

Since the end of World War II, public sector institutions globally have undergone different reforms with the aim of targeting positive change (Linna *et al.* 2010). The urgency of these reforms resulted from numerous concerns around cost, effectiveness, efficiency, accountability including better performance management and ultimately service delivery (Mihaiu *et al.* 2010). While most countries in Africa initiated public sector reforms and despite great effort and resources utilised, progress remained slow and minimal primarily due to political interference, unaccountable civil servants, non-compliance with reforms and decline in governance (Gabel-Shemueli and Capell, 2013; Lufunyo, 2013).

Public service operations globally need to respond to ever changing environments in order to meet the demands of globalisation including growing consumer expectations and physical demands (Du Toit,

Knipe, van Niekerk, van der Waldt, and Doyle, 2002; Gabel-Shemueli and Capell, 2013). However, despite many countries having strong economic policies, South Africa included, job creation and productivity growth are too low to support the rapid sustained gross domestic product (GDP) growth required per capita (Mihaiu *et al.* 2010; Van der Waldt, 2004). According to Muthien (2013) improved performance is urgently required in order to reduce the challenges faced by public sector. Challenges for government highlighted by Fourie (2014) include, building a platform for growth entailing suitable infrastructure and logistics, competitive input prices, skills technology, innovation including partnerships, efficient regulation and effective government offerings.

2.2.3 The Public Sector in South Africa

The most import issue in South Africa remains, improving the delivery of public services, as any democratic society needs to exhibit efficient, equitable and accountable public service which is critical for the growth of the economy and the development of the countries key strategic sectors which include, energy, transport, manufacturing and telecommunications (Fourie, 2014; Strassman, 1970). The countries poor democratic history has resulted in the public services transformation process entailing two key aims, first to improve public service delivery to all citizens and secondly to demonstrate that South Africa has truly evolved into a democratic society (Toor, Ogunlana, and Ofori, 2012).

According to Lane (2000) the public sector involves the part of the economy concerned with providing basic government services which include public roads, public transit, education, healthcare, the police and services which support society rather than individuals who use the service. In addition, citizens perceive public service as more than just national departments, provincial and regional administrations highlighted by the Public Service Act (1994). Fourie (2014), Muthien (2013) and Du Toit *et al.* (2002) suggest that citizens usually do not distinguish between local government, central government and provincial government. As a result, failure in any tier of government is seen as a failure of public service as a whole (Public Service Act, 1994).

South Africa is a constitutional democracy comprising a three-tiered system of government which entails national, provincial (nine provinces) and local (278 local municipalities) which operate interdependent and interrelated (Statistics South Africa, 2016). These tiers of government are autonomous and not hierarchical and are further exemplified by the South African Constitution (1996):

- *National* – in this sphere of government laws and policies are approved by Parliament which consists of the National Assembly and the National Council of Provinces (NCOP). Each department is responsible for preparing its budgets for work which is included in the national budget by Treasury. Government progress and goals are monitored by the Presidency who coordinate government work. In addition, the Department of Public Service and Administration

(DPSA) is responsible for setting out policies and frameworks for the public service at both national and provincial level. Provincial and local government is responsible for the coordination of provinces and municipalities (The South African Constitution, 1996);

- *Provincial* – entails nine provincial governments who employ directors and public servants to execute the work of government. Legislature approves laws and passes the annual provincial budget. In addition, each province is responsible for developing a Provincial Growth and Development Strategy (PGDS) which outlines the framework and plan for improving services and development. Furthermore, the provincial Member of the Executive Committee (MEC) and local government are accountable for the coordination of municipalities in the respective provinces (The South African Constitution, 1996);
- *Local* – consists of municipalities which are located across South Africa. These are managed by councils and officials who implement work within the municipality. The laws and annual budgets are passed by the members who make up the council including the development plans for service delivery. In addition, municipalities are further made up of metropolitans, local and district municipalities (The South African Constitution, 1996).

Municipalities are highlighted by Shah (2005) as the most basic units of government in the country which are tasked with providing basic services and promoting development in the regions under their control. Local government in South Africa is primarily understood in terms of service delivery and the South African Constitution (Act No. 108 of 1996) to assign municipalities the responsibility to organise economic resources for the improvement of all citizens lives (Shah, 2005; Statistics SA, 2016).

The Human Sciences Research Council (2016) further reinforces local government as a key implementer of delivery and development and is central to the entire transformative project of the new South Africa. This highlights local government as the sphere that engages with communities and tends to their needs towards trying to resolve service delivery challenges. Schiller (1993) emphasises that the root of governments successes or failures lie in the economic policies and decisions around government intentions on producing optimal output. As a result, governments intervention should be addressing failures in delivering public services and infrastructure (Muthien, 2013; Toor *et al.* 2012).

South Africa has however achieved noticeable progress in reducing poverty and inequality, yet still faces tremendous shortfalls in economic and social infrastructure (Financial and Fiscal Commission, 2017; Gabel-Shemueli and Capell, 2013; Linna *et al.* 2010; Lufunyo, 2013). The governments Infrastructure Development Plan (IDP) including the Presidential Infrastructure Coordinating Commission (PICC) which together coordinate infrastructure expenditure between the three spheres of government indicate positive signals for future industry growth (Price Waterhouse Cooper, 2016). Furthermore, the Construction Industry Development Board (CIDB) Building and Construction Sector

Report (2017) highlights the delivery of services through infrastructure spending is a good indicator of public sector performance in the construction industry. However, this was prior to the outbreak of the global covid-19 pandemic, discussed later in the chapter.

2.2.4 The Importance of Public Service Delivery

The South African constitution underlines the clear provisions of the importance of the public service delivery to the government and people of South Africa through the adoption of Act 108 of 1996. Furthermore, the tone for public service is set by providing the following basic values and principles governing public administration:

- A single public service for the country,
- Public administration shall be governed by the democratic values and principles set out in the constitution,
- A high standard of professional ethics including the economical, efficient and effective use of resources,
- A development orientation, with unbiased, fair and equitable service delivery,
- Responsiveness to community needs and participation in policy making,
- Public administration accountability,
- Providing timely, accessible and accurate information including transparency,
- Effective human resource management and career development practices to maximise human potential,
- A public administration that represents the population and human resource management based on ability, objectivity and fairness,
- Possible appointment of senior public officials on the basis of policy considerations,
- A single, independent, impartial and advisory public service commission (The South African Constitution, Act No. 108 of 1996).

Schwella (2001) reinforces that the supreme law of the country is serious about service delivery to the people by means of a transformed public service department. Service delivery is primarily implemented in cities first, then other sparse locations in the country. While many remote and rural areas yearn for improved service delivery and these are a priority to government, cities are central hubs from which economic development occurs (Mahajan, 2014).

2.2.5 The contribution of Cities to the Economy and Development through Service Delivery

Cities within a country have a great impact on growth and development in the economy (Stren, 2014). While governments are required to cope with increased city growth, poverty and the establishment of large informal and un-serviced areas of housing, focus has moved to managing public services,

transport, waste disposal including housing and the supply of clean water (Mahajan, 2014). However, the provision for and delivery of these services are challenging due to the increasing number of citizens living in severely underserved conditions (Cross, 2014; Charlton, 2008; Montgomery, 2013). Table 2.1 identifies some of the key cities which stimulate economic growth in South Africa, with the provinces of Gauteng, KwaZulu-Natal and the Western Cape being the most active in terms of service delivery implementation.

Table 2.1: Key South African Cities (South African Cities Network, 2016: 8)

No.	Province	City
1	Gauteng	<ul style="list-style-type: none"> • Tshwane • Ekurhuleni • Johannesburg
2	Kwazulu-Natal	<ul style="list-style-type: none"> • Msunduzi • Ethekwini
3	Free State	<ul style="list-style-type: none"> • Mangaung
4	Eastern Cape	<ul style="list-style-type: none"> • Buffalo City • Nelson Mandela Bay
5	Western Cape	<ul style="list-style-type: none"> • Cape Town

Cities generate around two-thirds of economic activity in the country including more than half of national employment (Altman, 2008). In addition, they have good strategies in place to facilitate economic growth, social development and service delivery which places them in a strong position to lead the country's economic recovery and development (Gouverneur, 2014). While cities attract many people in search for work and a better quality of life, many arrive without skills or resources, competing for scarce job opportunities resulting in increased poverty, unemployment and overcrowding (Williams, 2000). This applies pressure on the need for the delivery of reliable public services (de Visser, 2009).

According to Gouverneur (2014) and de Visser (2009) South African cities generally follow resource intensive growth paths which suffer from inefficiencies across energy, water, waste including food and transport departments. As a result, sustainable growth paths and priorities are required to be put in place in order to monitor performance.

Spatial transformation is also important for cities to become more productive, complete and sustainable (Cross, 2014). A report issued by the South African Cities Network (2018) highlights that apartheid caused many inefficiencies in South African cities which spatially displaced the oppressed population and deserted public transport, including developments post 1994 that continued to locate poorer populations in outlying areas, directly impacting productivity caused by long expensive commutes.

Government systems need to be reconfigured to support positive growth towards improving delivering public services (Mahajan, 2014; Montgomery, 2013). This entails support across government, public spheres and sectors including improved relations with private sector and greater use of industry knowledge (Cross, 2014; Gouverneur, 2014).

2.2.6 Public Sector Inefficiencies

The World Bank mission for poverty alleviation including the achievement development goals identifies a well-functioning public sector that delivers quality public services consistent with citizen preferences and that fosters private market led growth while managing fiscal resources prudently (World Bank, 2021).

Historically, public trust in the performance of the public sector delivering services in alignment with preferences of citizens has been viewed as weak in developing countries (Shah, 2005). de Visser (2009) suggests that the reason for this stems from political interface showing greater interest in activities that seek rather than delivering services to the public. Over the years, governments have restructured public sectors towards aiming to address citizens appreciation and dissatisfaction with government (Cross, 2014). Restructuring efforts in public sectors include performance or results-based management approach in the public sector (Montgomery, 2013).

At the municipal and local level, services may be delivered in a variety of ways and include public provision only, private provision only or public private partnerships (PPP) (Williams, 2000). Efficiency is attained when all service responsibilities are organised and allocated to enable society to maximise gains from all resources at its disposal (Kitchen, 2004). However, barriers to efficient public sector decision making can result in the misallocation of resources and be more costly to society (Altman, 2008; Gouverneur, 2014).

Infrastructure services in terms of quantity and quality need to be adequate for improving and maintaining the standards of living in an economy (Shah, 2005). Unlike other products infrastructure services such as water and sanitation, electricity, transportation, and telecommunications are essential for households and businesses (Kitchen, 2004). Therefore, when services are in short supply or costly to produce, production and standards of living are negatively impacted (Bhuiyan and Amagoh, 2011; Shah, 2005). Vast population groups in many countries specifically the poor, incur great economic and human costs due to severe shortages in infrastructure services (World Bank, 2015). This issue is critically important for public policy as the design of public policy towards infrastructure requires information for performance measurement, and this information is usually costly to obtain (Blum, Manning and Srivastava, 2012; Salehi and Ramirez, 2003).

According to Fourie and Poggenpoel (2016) public sector reforms have not been very successful around the world as many still face challenges. As a key component of the economy, it is imperative for the public sector to address its challenges sufficiently in order to curtail the negative impacts on economic growth and development. In response to the challenges governments face in delivering goods and services to citizens, the World Bank (2015) highlights the urgent need for a science of delivery in development. In addition, Blum *et al.* (2012) emphasises that many countries while good at policy development and understand the policy direction intent, are less successful during policy implementation. Service delivery through the public sector in line with policy is instrumental towards ensuring countries developmental goals are achieved. While the world is faced with various economic, political and technological challenges which force government institutions to identify alternate and new ways to improve public sector including many reforms (Bhuiyan and Amagoh, 2011).

The process of reform is ongoing in African countries for over a quarter of a century and most strategies implemented for public sector reform are unsuccessful primarily due to difficulties in implementation (Ayee, 2008). In addition, management reforms in the public sector have had minimal impact on performance. This depicts a clear picture of the public sector in Africa as not being successful in addressing its challenges (Ghobadian, Viney and Redwood, 2009).

The South African public sector has been identified as a key component of the country's economy and plays a critical role in economic growth and development. However, government experience numerous challenges (these challenges are discussed further in the next section) when addressing service delivery (Curristine, 2005; Moe and Paivarinta, 2013). In addition, various authors have conducted studies on public sector challenges including how to deal with them while focusing only on the symptoms, which enables recommendations to address the evidence of the challenges rather than the root cause (Jarrar and Schimua, 2007; Modell, 2005; Montiel, 2011).

Government has been accused of inadequate service delivery to citizens on numerous occasions which has been seen via service delivery protests emphasising inequality and problems in the public sector (Fakir, 2014 and Beukes, 2014). Various symptoms hindering service delivery highlighted by Janse van Rensburg (2014) include: incompetent public servants, a lack of accountability, poor human resources practices, inadequate procurement practices and a lack of leadership. In addition, key problem areas include service delivery difficulties, poor management of finances, high level of unemployment, nepotism and corruption (Akinboade, Kinck and Mokwena, 2012).

Authors such as Akinboade *et al.* (2012), Francis (2013) and Janse van Rensburg (2014) highlight, although the listed aspects and problems all contribute to the inadequate service delivery in South Africa, ineffective leadership is the ultimate key problem and that has been evident in the South African public sector for some time. This situation is created by appointing incompetent senior officials

including the absence of accountability from public sector leaders. Fourie and Poggenpoel (2016) identified recurring problems in the public sector which include:

- Constant recurrence of the same findings,
- Resource optimisation, accountability, and a culture of non-compliance,
- Root causes of problems are not adequately addressed.

Decisions related to procurement of public sector projects should be underpinned by vigorous risk assessment and management processes, specifically at project inception (Carrim, 2009; Emuze and Smallwood, 2013). Fakir, (2014) and Beukes, (2014) further emphasise public sector organisations should consider increasing their capacity in specialty areas such as project management. As a result, this study focuses on identifying the barriers hindering the successful implementation of National Treasuries Framework for Infrastructure Delivery and Procurement Management (FIDPM) towards improving public sector service delivery through the implementation of project management tools and techniques.

2.3 Public Service Delivery and its Challenges in the Construction Industry

The construction industry is described as the branch of manufacture and trade based on the building, maintaining, and repairing structures and is further divided into three sub-sectors: construction of buildings, construction of roads, highway and other infrastructure construction and speciality trades (Hillebrandt, 2000; Ofori, 1990; Standard Industrial Classification, 1996; Tatum, 1989). In addition, the construction industry includes public and private infrastructure, all businesses that build houses, office buildings, highways and bridges including those that implement specialised work of electricians, plumbers and masons who are involved in the construction of all kinds of structures (Kikwasi and Escalante, 2018; Kirchberger, 2018; Szymanski, 2006).

While the construction industry may not have a common definition including arguments of whether it is an industry or a sector that comprises numerous industries, its contribution to economic growth and long-term national development is extensively acknowledged, highlighting its importance particularly in developing countries (Hillebrandt, 2000; Kirchberger, 2018; Lopes, 2011; Ofori, 2015; Turin, 1973). With its important contribution to economic development and economic activities, the construction sector has significant affect in the development of any nation (Dlamini, 2012; Merrifield, 1999). Due the vast and responsive nature of the construction industry including its strong linkages with other industries, it is a key sector which can affect development in the economy (Durdyev and Ismail, 2012; Olarewaju and Ibrahim, 2020).

In South Africa, the construction industry is a significant contributor to employment and growth in the economy (PwC Report, 2016). It has a remarkable contribution to sustainable economic development

by satisfying some of the basic objects of development including output generation, employment creation and income generation and re-distribution. It further has a key role in satisfying basic physical and social needs including the production of shelter, infrastructure and consumer goods (Durdyev and Ismail, 2012; Merrifield, 1999; Wibowo, 2009).

The construction industry is seen as a key sector through which service delivery is implemented by the public sector (Olarewaju and Ibrahim, 2020). As a result, government declared the construction industry a national asset in order to achieve economic growth and improve the populations quality of life (Didiza, 2008).

2.3.1 Public Sector Service Delivery

Service is defined as the distribution of basic resources citizens depend on like water, electricity, sanitation infrastructure, land and housing (Chen, Dean, Frant and Kumar, 2014). Nengwakhulu, (2009:344) further defines public service as “*an administrative vehicle by means of which governments deliver all kinds of tangible services to their citizens*”. These include tangible services such as water, sanitation, housing, electricity, employment, healthcare, education and infrastructure amenities including intangible services such as the social aspects of restoring human dignity and respect in delivering public services (Crous, 2004; Wilson, 2012).

Service delivery can be measured as demand and supply side. In most instances, service delivery in the public sector is measured from the demand side which include surveys such as Population Census, Community Survey (CS) and General Household Survey (GHS) which collect data from households on the extent, type and quality of services they receive. On the supply side, municipalities (suppliers) furnish the delivery related data to Statistics South Africa during the annual Non-Financial Census of Municipalities survey (Kanyane, 2014; Statistics South Africa, 2015). Municipalities provide a wide range of basic services such as water, electricity, sewerage and sanitation including solid waste management. Basic services are those services that, if not provided, would endanger public health or safety (Chen *et al.* 2014; Nengwakhulu, 2009; Statistics South Africa, 2015).

Public service delivery can therefore be seen as the provision of services provided by the government to all citizens as per their expectations and mandate highlighted in the Constitution and failure to provide these services would result in a violation of the right to have access to basic services and a better life (Crous, 2004; Mashamaite, 2014; Nengwakhulu, 2009; Wilson, 2012).

2.3.2 History of Service Delivery in South Africa

South Africa is often described as a world in one country which is characterised by diversity, pluralism and inequality (Chen *et al.* 2014). The government policies and frameworks of the countries past, apartheid and separate development contributed to the fragmentation of South African society through their emphasis on forced separation (Kanyane, 2014; Nengwakhulu, 2009). Diversity and multiplicity have contributed to the deeply divided and unequal state of South African society. These types of societies are generally regarded as difficult to govern and administer and South Africa is no exception to this generalisation (Crous, 2004; Mashamaite, 2014; Wilson, 2012). As a result, service delivery in South Africa is affected by the societal context and the diverse needs of client base. The trends in these areas indicate that providing services to South African society poses challenges (Democracy, Governance and Service Delivery Programme, 2016; Schwella, 2001).

Change in the South African public service has gone through a number of phases since the start of democracy in 1994 which include the consolidation and integration of various unequal geo-political entities from apartheid into a unified government and public service (Batho Pele Policy Review, 2003). There has been a major drive-in respect of service delivery (Nengwakhulu, 2009).

Considering the extent of policy formulation and promulgation with respect to public sector service delivery since the change in government in South Africa in 1994, it is clear that performance and delivery of the public service has not matched the real and good intentions of the policy makers (Kanyane, 2014; Mashamaite, 2014; Schwella, 2001). The Public Performance and Management Review, (2001) exemplifies the experience of public service delivery as being between the ecstasy of policy intention and the agony of current reality. This is further supported by authors Petunia and Selepe (2020) who highlight that departments are strong on policy, but weak on delivery.

Whilst the need to meet basic needs through service delivery can be justified on social and moral grounds with specific reference to the country's past, there are additional imperatives (Madzivhandila and Asha, 2012). These relate in particular to the ways in which service delivery can help provide the necessary infrastructural support to open up previously suppressed economic and human potential in both rural and urban areas. The intent is to improve community empowerment and increase output in all sectors of the economy (Batho Pele Policy Review, 2003; Madzivhandila and Asha, 2012; Managa, 2012)

2.3.3 Service Delivery Objectives Around the Globe

All spheres of government are charged with the constitutional mandate of providing public services (Constitution of the Republic of South Africa, 1996). The World Bank (2015) highlights that many countries have embarked on a range of public sector reforms aimed at improving, modernising and

developing the system in which services are provided to their citizens. These reforms place emphasis on the citizen as an active consumer or client of public services. More specifically, these reforms focus on people management, making the government more efficient, improving quality of services, improving policy making, improving partnerships outside central government, making management more effective and improving financial management (The World Bank, 2015). Some of the key public service delivery objectives targeted around the globe are discussed:

In the United State of America (USA) – important public service delivery principles focused on by government in the USA include competition between service providers, empowering citizens, focusing on outcomes, being driven by missions, having the client as customers, preventing problems, earning money, decentralising authority, utilising marketing mechanisms, and catalysing all sectors into action (Osborne and Gaebler, 1992).

In Malaysia – the government recognised that attitudinal and behavioural changes were crucial to any reform effort and embarked on programmes towards driving service delivery through positive work ethics (Jeong, 2003). Critical programmes identified through the Administrative Modernisation and Management Planning Unit of Malaysia included: excellent work culture movement which focused on meeting customer requirements based on their awareness and importance of providing quality products and services as a way of life. Total quality management towards ensuring all available organisational resources meet customer requirements including improvement programmes into training to enable government to train public servants and follow through on the training received (National Conference on Public Service Delivery, 1997; Jeong, 2003).

In the United Kingdom – the Citizen's Charter (1991) pushed service delivery a step further by identifying the citizen as a customer of public service. Due to most costs in public service being funded by citizens through taxes, citizens are entitled to high quality services. In addition, public sector employees are keen to improve the services they provide as they have the skills and enthusiasm to do so (Public Service Commission of Canada, 2000). The charter closely approximates to the Batho Pele policy (Batho Pele is a policy in South Africa which outlines eight key principles for transforming public service delivery). Finally, the UK charter focuses on four themes, namely, quality, choice, standards and value (The Citizen's Charter, 1991).

In Canada – while similar to the UK, the main public service driver reform focused on reducing costs and improving efficiency. Furthermore, important focuses of change towards public service improvement were identified by the Canadian Treasury Board: government is successful in controlling expenditure. Continuous investment in training and development, including the recruitment and retainment of high-quality public servants and at all levels. Building positive labour relations including

simplifying and modernising management and administrative systems (Public Service Commission of Canada, 2000).

In Australia – public service reform was also guided by concerns of financial constraints and the governments need to improve services. As a result, government aggressively pursued privatisation and decentralisation of service. Key reforms included: the introduction of an explicit merit regime. Promoting values within organisations including widespread structural government reforms. Annual reporting by government agencies on performance standards and client feedback (Australian Department of Finance and Administration, 2000).

Summary of Global Service Delivery Objectives – collectively it is evident that there are similarities and common approach globally towards improving service delivery to ensure that citizens and public sector employees are: given quality service delivery (Jeong, 2003; Osborne and Gaebler, 1992). Best value for money (The Citizen’s Charter, 1991). A standard for the delivery of services, and annual reporting on public sector performance is shared (Australian Department of Finance and Administration, 2000; Public Service Commission of Canada, 2000). While public sector employees have work culture, ethic, and values support (National Conference on Public Service Delivery, 1997). Training, development and follow through (Jeong, 2003). A System of recognition and merit (The World Bank, 2015). High quality and skilled resources are recruited and are held accountable for public service performance (Public Service Commission of Canada, 2000).

2.3.4 Public Sector Service Delivery Objectives in South Africa

Post 1994, the South African government committed its attention and limited resources to the local sphere of government to perform its constitutional obligations. In addition, to capacitate municipalities to meet developmental requirements and speed up service delivery, extensive human and financial resources acquisition were necessary. Furthermore, the adoption of key legislative measures was critical to realise developmental local government objectives (Mogale, 2003; Mfene, 2013). These included:

- Local Government: Municipal Systems Act, 2000 (Act 32 of 2000) – the act intends, “*to provide for the core principles, mechanisms and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of local communities and ensure universal access to essential services that are affordable to all*”.
- Local Government: Municipal Finance Management Act, 2003 (Act 56 of 2003) – the act intends, “*to secure sound and sustainable management of the financial affairs of municipalities and other institutions and to establish treasury norms and standards for the local government sphere*”.
- Local Government: Municipal Property Rates Act, 2004 (Act 6 of 2004) – the act intends, “*to amend the Local Government: Municipal Systems Act, 2000 to make further provision for the*

...serving of documents by municipalities, to amend or repeal certain legislation and to provide for matters connected therewith”.

The ideals of the constitution for the public service are supported by the White Paper on the Transformation of the Public Service (White Paper on Transforming Public Service Delivery, 1997). The paper is clear and specific on the rationale for administrative transformation in South Africa and describes a major role for the public service institutions in the process of reconciliation, reconstruction and development.

2.3.4.1 The White Paper on the Transformation of the Public Service

The intent of service delivery to South African citizens cannot be clearer and is confirmed in the vision and mission statements for the public service provided for by the government in the White Paper on the Transformation of the Public Service, which are:

- Vision Statement – *“the government of national unity is committed to continually improving lives of the people of South Africa by a transformed public service, which is representative, coherent, transparent, efficient, effective, accountable and responsive to the needs of all”,*
- Mission Statement – *“the creation of a people centred, and people driven public service, which is characterised by equity, quality, timeousness and a strong code of ethics”* (White Paper on Transforming Public Service Delivery, 1997).

Based on the vision and mission statements, the importance of improved service delivery is explicit. In addition, it highlights the definite need to develop strategies to promote continuous improvement in the quantity, quality, and equity of service delivery. As a result, these strategies aim to generate mission statements for service delivery linked to service guarantees. Identify services and target populations for services with emphases on affordability and redress. Set clear service standards, define outputs and targets, and determine performance indicators benchmarked against international standards. Manage service delivery by means of sound human and financial resource management in partnerships with the private sector, nongovernmental organisations and the community, and develop a culture of customer care and context and client sensitive service delivery (White Paper on Transforming Public Service Delivery, 1997).

The White Paper on the Transformation of the Public Service is the most important policy statement on public service delivery, and it is very clear and professional about the importance of service delivery by the public service. The emphasis of the policy is in accordance with international best practices and shows a serious commitment to the importance of service delivery and customer care for the citizens from their public service. Beyond the legislative measures and policy guidelines, two initiatives have been taken by government that are specifically aimed at improving service delivery: Project Batho Pele

and the Code of Conduct for Public Servants (White Paper on Transforming Public Service Delivery, 1997).

2.3.4.2 Project Batho Pele

In October 1997, the White Paper on Transforming Public Service Delivery, the Batho Pele White Paper was introduced to into effect the commitment of the government to extend services to all citizens (Batho Pele Policy Review, 2003). Batho Pele, is a Sesotho word meaning “*People First*”, is an initiative launched in 1997 by the government to transform the public service. The White Paper was launched as democratic South Africa inherited a public service that was not people friendly and lacked the skills and attitudes to meet the developmental challenges facing the country (Public Service Commission Report, 2008).

Public servants are at the for front of implementation management. Therefore, the success of governments programmes and policies depend on the public service. Batho Pele is a belief set that is used to improve service delivery in the public service (Batho Pele Policy Review, 2003). It further emphasises that transforming service delivery for improved efficiency and effectiveness requires quality leadership in the public sector. Participation by all stakeholders and customers, in the process of improved service delivery. Encouraging common ownership of the service delivery process and products, and training all stake holders to ensure quality, competence, service ethics and gains from comparative international and private sector experience (Schwella, 2001).

As a result, Batho Pele is based on the following eight principles:

1. *Consultation* – citizens should be consulted about their needs,
2. *Standards* – all citizens should know what service to expect,
3. *Redress* – all citizens should be offered an apology and solution when standards are not met,
4. *Access* – all citizens should have equal access to services,
5. *Courtesy* – all citizens should be treated courteously,
6. *Information* – all citizens are entitled to full, accurate information,
7. *Openness and Transparency* – all citizens should know how decisions are made and departments are run and
8. *Value for Money* – all services provided should offer value for money (White Paper on Transforming Public Service Delivery, 1997).

2.3.4.3 The Code of Conduct for Public Servants

The code of practice for public servants links up with the constitution by noting that in order to give practical effect to the relevant constitutional provisions relating to public service, all employees are expected to comply with the code of conduct (Public Service Act, 1994). The code further states that

compliance can be expected to enhance professionalism and help ensure confidence in the public service. It provides specific guidelines for behaviour with respect to employee relationships with the legislative and executive branches, the public and employee performance of duties and personal conduct and private interests. Furthermore, service delivery aspects are given special consideration under the headings, “*Relationships with the Public*” and “*Performance of Duties*”. The code is serious in its commitment for public servants to act in a professional and service-oriented way. Finally, the code emphasises that if known and adhered to by public servants, there should be no doubt that it should enhance service delivery by the public service (Public Service Act, 1994; Republic of South Africa, 1996).

2.3.4.4 South African Public Service alignment with International Standards

When considering the legislative, policy and other guidelines for action with respect to service delivery by the public service, there is no doubt that they are in accordance with modern and international best practice requirements. The Constitution (Republic of South Africa, 1996), the White Paper of the Transformation of the Public Service (1997), Project Batho Pele and the Code of Conduct for Public Servants (Public Service Act, 1994) provides values, vision and mission statements including institutional and personal guidelines aimed at quality and professional service delivery.

New management strategies globally for service delivery involves the importance of reorientating management strategies and systems in order to effect improvements in the way services are delivered (The World Bank, 2015). These include:

- *Development of more flexible regulatory frameworks* – central control is exercised through frameworks which set the overall management parameters. This leaves decisions about the management process to be determined at an operational level, allowing maximum flexibility for managers to respond appropriately (Jeong, 2003; National Conference on Public Service Delivery, 1997).
- *Improvement of human resource management systems* – central to the importance of improving service delivery. If staff are treated with consideration and respect by senior managers, they would in turn treat their customers with consideration and respect (Public Service Commission of Canada, 2000).
- *Development of more results-oriented management systems* – development of financial, operational and human resource management systems which measured performance primarily regarding whether targets have been met (Australian Department of Finance and Administration, 2000).
- *Decentralisation and delegation of management responsibility* – increased delegation of management responsibility at national, provincial and local government level enabling those

who deliver services to come up with workable and innovative ideas for improving services (The Citizen’s Charter, 1991).

- *Systematic sharing of good practice* – goal to bring service deliverers across public service together in order to pass learning experience rather than work in watertight compartments with little contact between departments (Jeong, 2003; Osborne and Gaebler, 1992; The World Bank, 2015).

In South Africa, detailed regulation and central prescription has resulted in excessive bureaucracy and lengthy procedures which were against the interests of customers, internal and external (Public Service Commission Report, 2008). In addition, service deliverers are currently forced to spend too much of their time trying to get decisions made and complying with central requirements, many of which hamper the delivery of services to the customer (Republic of South Africa, 1996; Schwella, 2001).

2.3.5 Service Delivery Challenges and Barriers to its Successful Implementation

2.3.5.1 Service Delivery Challenges around the Globe

The World Bank (2015) identifies countries around the world that are striving to improve public service delivery. There is no blueprint of solutions. Modernised and sophisticated technical solutions have proven insufficient to improve services for the poor (Mangai, 2017). In addition, experience suggests that without political, administrative and social institutions, service delivery improvements do not come simply through policy reforms, administrative engineering, facility modernisation or staff training. Improving public services requires making policy makers, public servants and service providers accountable to citizens and promoting citizen engagement and trust in public institutions (Masiya, Davids and Mangai, 2019). Table 2.1 highlights common service delivery challenges experienced around the globe:

Table 2.2: Common Service Delivery Challenges resulting in Delays Around the Globe

Country	Delays resulting in Service Delivery Challenges	Source
United Kingdom	<ul style="list-style-type: none"> • Pending information. • Change orders. • Procurement of plant, machinery and equipment. • Procurement of materials. 	Sullivan and Hans (1986), World Bank (2015)
Nigeria	<ul style="list-style-type: none"> • Delayed payments to contractors from public sector. • In adequate planning and scheduling. • Common variation/ change orders. • Shortages in public agencies organisations. • Unachievable contract period. 	Okpala and Aniekwu (1988), World Bank (2019)
Thailand	<ul style="list-style-type: none"> • Procurement of materials. • Delay in information. • Design delays. • Poor planning and programming. • Cost implicated changes. 	Ogunlan, Prokuntong and Jearkjirm (1996)

Indonesia	<ul style="list-style-type: none"> • Changes in design. • poor planning. • Shortage of equipment. • Shortage of materials. • Poor prediction of equipment production rate. 	Kaming, Olomolaiye, Holt and Harris (1997), World Bank (2019)
Hong Kong	<ul style="list-style-type: none"> • Poor site management. • Delays in design information. • Lack of communication between consultant and contractor. • Lengthy decision-making involving project and client teams. • Inadequate site resource allocation. 	Chan and Kumaraswamy (1997), World Bank (2019)
Saudi Arabia	<ul style="list-style-type: none"> • Delays in client progress payments. • Delay in mobilisation. • Changes in scope of the project. • Ineffective planning and scheduling of the project. 	Assaf and Al-Hejji (2006)
Malaysia	<ul style="list-style-type: none"> • Inadequate planning. 	Lim and Mohamed (2000)
Ghana	<ul style="list-style-type: none"> • Poor contract management. • Planning and scheduling deficiencies. 	Frimpong, Oluwoye and Crawford (2003)
Vietnam	<ul style="list-style-type: none"> • Inaccurate time allocation to key activities. • Improper planning and scheduling. 	Long, Ogunlana, Quang and Lam (2004)
UAE	<ul style="list-style-type: none"> • Inadequate early planning of the project. • Slowness of the owner's decision-making process. 	Faridi and El-Sayegh (2006)
Saudi Arabia	<ul style="list-style-type: none"> • Ineffective planning and scheduling of the project. 	Assaf and Al-Hejji (2006)
Malaysia	<ul style="list-style-type: none"> • Improper planning. • Lack of communication between parties. • Mistakes during the construction stage. 	Sambasivan and Soon (2007), World Bank (2015)
Canada	<ul style="list-style-type: none"> • Poor control in government expenditure. • No dedication and commitment from public servants. • Complex and difficult to adopt management and administrative systems. 	Public Service Commission of Canada (2000), World Bank (2015)
Australia	<ul style="list-style-type: none"> • Poor organisational values in government. • No culture of performance management in government. • Minimal annual reporting on performance against standards. 	Australian Department of Finance and Administration (2000), World Bank (2015)
India	<ul style="list-style-type: none"> • Poor implementation of the Citizen Charter from top level government. • Inadequately trained public servants. • Unrealistic targets service delivery targets proposed by government. 	National Conference on Public Service Delivery (1997), World Bank (2015)

2.3.5.2 Service Delivery Challenges in South Africa

Economic policies and decisions around an appropriate economic mix on the best approach for government to yield optimal output are the root causes for governments success or failures (Khumalo, Choga and Munapo, 2017; Nengwakhulu, 2009). It is argued that government intervention is to address market failures (Schiller, 1993). The South African government like many economies has placed infrastructure spending as the centre of its economic growth strategy (Chen *et al.* 2014; Managa, 2012). In the global context and with its many past disparities of oppressive history, South Africa has had to play catch up in dealing with unemployment, poor economic growth, underdevelopment, poverty and inequality (Mashamaite, 2014). In the third decade of the countries post-apartheid constitutional democracy, serious concern has been raised about the government and its ability to deliver public services that its citizens painfully yearn for and are entitled to (Khumalo *et al.* 2017; Olaregaju and Ibrahim, 2020).

Major challenges hampering key performance that face local government include acute problems of:

- *Institutional capacity* – numerous municipalities around the country lack expertise resulting in inadequate staffing, deteriorating service delivery over the years leaving communities with insufficient access to basic services. In addition, the shortage of skills has resulted in

overwhelming service delivery backlogs which have prevented government from addressing these problems (Manyathi, Burger and Moritmer, 2021; Mashamaite, 2014; Visser, 2012),

- *High levels of corruption* – the extent and nature of corruption stems from the country’s bureaucratic traditions, social history and political development. Both local government elites and high-profile politicians in government have been accused of corruption in accepting bribes, illegal tendering procedures, and unauthorised expenditure (Burger, 2009; Khumalo, Nthokonkulu and Rapoo, 2003),
- *Mismanagement of funds* – due to the provision of poor-quality services, many municipalities cannot supplement their budget allocations in providing services required. As a result, communities seldom pay for any services received which depicts low efficiency levels by government due to lack of affordability by communities (Alexander, 2010; Managa, 2012; Mosombuka, 2001),
- *Lack of public participation* – the exclusion of the public from local decision making and accountability by municipal officials have resulted in public protesting and violent rioting throughout the country which is in direct contravention with the Municipal Systems Act 32 of 2000. The act states communities have the mandate to participate in public consultation and decision-making processes in local sphere of government (Ambe, 2016; Khumalo *et al.* 2017; Masiya *et al.* 2019).

In addition, service delivery challenges in South Africa are underpinned by three primary areas of influence. These are:

- *Political issues* – based on the country’s poor democratic history, public service transformation has two aims, firstly to improve the delivery of services to all people. Secondly, to demonstrate that South Africa has become a truly democratic society. Public service is perceived as more than just national and provincial departments (Public Service Act, 1994). Citizens do not see distinction between local, provincial and national government as failure by one is seen as public service failure as a whole.
- *Policy issues* – the Green Paper on Transforming Public Service Delivery drives the process for transforming the delivery of public services. The green paper puts pressure on systems, procedures, attitudes and behaviours within public service and realigns them in the citizens favour. The challenge is ensuring that all public servants are geared up to ensure implementation.
- *Implementation issues* – the implementation of transformed and improved service delivery cannot wait for fundamental management changes and the development of new management tools. Due to public service reform being seen as extremely urgent, there is no choice but to tackle both reforms simultaneously. The implementation of service delivery reform is not a once of task, but a continuous and dynamic process which will go on for years to come

(Alexander, 2010; Khumalo *et al.* 2017; Mangai, 2017; Masiya *et al.* 2019; National Conference on Public Service Delivery, 1997; Ngcamu, 2019; Public Service Act, 1994)

Since the introduction of the Batho Pele framework for transforming public service delivery in 1997, this policy was seen as a commendable intervention by the democratic state. However, the commendable elements of the policy were reduced by implementation shortcomings which included:

- A lack of policy design and implementation framework,
- Absence of people centred culture in the public service,
- Not ingrained in the daily activities of public servants at work,
- Training and development programmes not being underpinned by people first values,
- Lack of effective monitoring and evaluation mechanisms internally and externally,
- Virtual absence of induction for new employees, as a result, many know little about the policy imperatives,
- Efforts to improve policies focus mainly on public service and little attention is paid to citizens and the role they play in making the policy work,
- Batho Pele is seen as a narrow mechanism to enhance service delivery rather than being understood within a broader strategic and governance framework,
- Senior management makes little effort to motivate staff as part of internal people management,
- Strategic planning activities on service delivery are limited to senior management and seldom are frontline employees who are key in driving service delivery are included (Batho Pele Policy Review, 2003).

2.3.5.3 Service Delivery Challenges in the Construction Industry

Service delivery in the South African construction industry post 1994 has seen its challenges over the years (Ngcamu, 2019). The government has through the years developed and implemented numerous policies and frameworks to facilitate service delivery in the construction industry (Khumalo *et al.* 2017). To date, there are still unresolved challenges (Masiya *et al.* 2019). As a result, government through National Treasury has released the Framework for Infrastructure Delivery and Procurement Management (FIDPM) in October 2019 as an initiative towards ensuring a systematic and structured approach for infrastructure procurement and delivery management for the successful delivery of construction projects (FIDPM, 2019).

The construction industry suffers from public service skills shortages that affect the capacity of the industry and the public sector in terms of project delivery. The differing levels of skills in the industry directly result in poor performance concerning project costs, time and quality (Construction Industry Development Board, 2017). One of the fundamental challenges of the South African government is service delivery in the construction industry. Some of these challenges include:

- delays and disruptions during construction,
- poor site management,
- time and cost variations,
- skills and competence issues,
- lack of quality improvement processes,
- a lack of worker participation, and
- delays in the completion of public sector projects from project inception to close out (SA Government New Agency, 2017; CIDB, 2017)

Other causes of project delays were attributed to issues related to procurement, civil works, land acquisition, consultant recruitment, natural calamities and a host of government procedures within the country (Ashan and Gunwan, 2010). Procurement is one of the biggest challenges encountered on public sector projects (Ambe, 2016). Delays in procurement often caused due to long bid evaluation times, operational delays by implementing organisations and inexperience of local authorities supervising the projects. In addition, governmental bureaucratic problems now include slow decision-making processes and policy changes (Emuze and Smallwood, 2011).

A host of recent publications have continually beamed the search light on project performance, with specific reference to South Africa and its construction industry (Manyathi, Burger and Moritmer, 2021). While the Construction Industry Development Board (CIDB) has had some impact on the countries construction industry performance, there is still room for further development as performance is not improving as expected (Emuze and Smallwood, 2013).

Figure 2.2 presents a summary of critical service delivery challenges still present in South Africa.

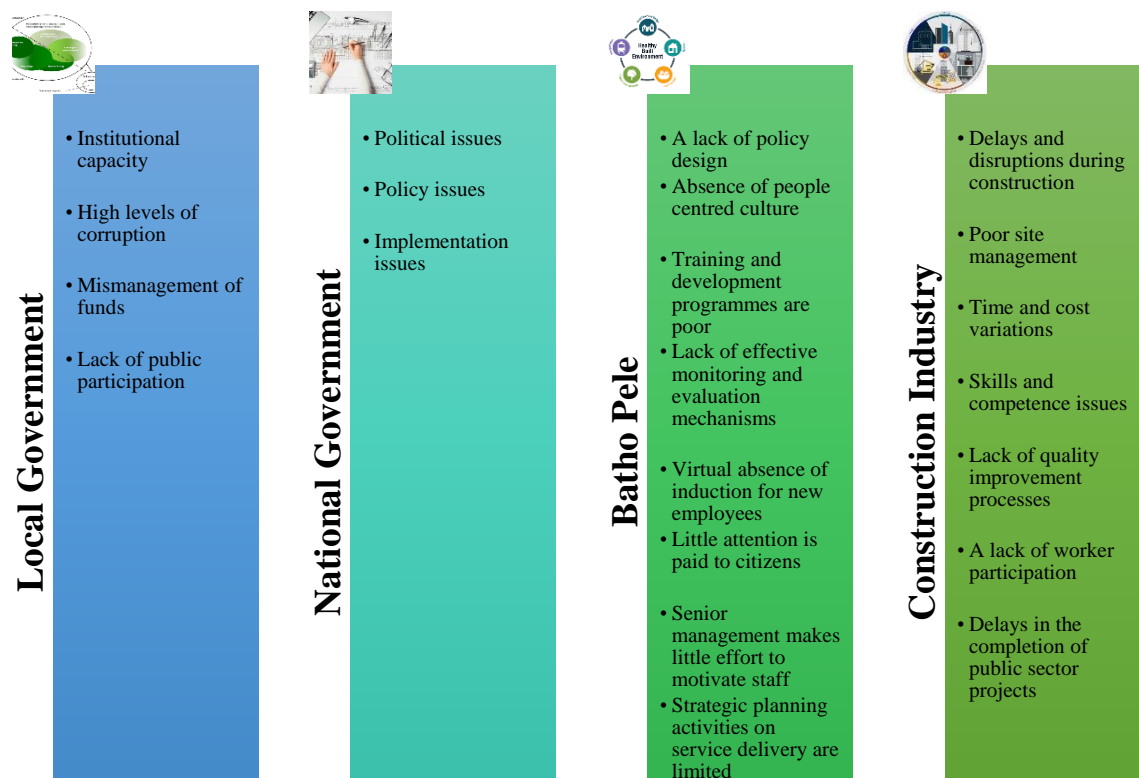


Figure 2.2: Critical Service Delivery Challenges

The constitution outlines a developmental mandate of local government. Within this mandate the executive authority of a local municipality needs to determine the best way, using partnerships, programmes and services to render services to the maximum benefit of the community, quality service delivery and monitoring standards are therefore critical components of an effective and responsive local government (Africa’s Public Service Delivery and Performance Review, 2012).

However, government’s inability to provide basic services promised post 1994 to all citizens with specific reference to those previously disadvantaged by the apartheid regime has resulted in communities displaying their frustrations and impatience over slow and poor service delivery in the form of protests, strikes, boycotting and petitions characterized by violence, vandalism, bloodshed and looting (Clark ,2011; Matebesi and Botes, 2017; Morudu, 2017; Ngcamu, 2019; Zubana, 2011).

The provision of basic service delivery in most municipalities has been very slow and has failed to meet the expectations of the majority of people. As a result, public service delivery protests have been rife in municipalities across South Africa (Clark, 2011). Figure 2.2 depicts school learners crossing a river to

get to school in KwaZulu-Natal in 2020, while Figure 2.3 highlights governments poor attempt to sanitation near an informal settlement in the Western Cape in 2019.



Figure 2.3: Inadequate Access to School for Learners KwaZulu-Natal, South Africa (Source: Google Images, 2020)



Figure 2.4: Informal Settlements and Chemical Toilets due to lack of Services in the Western Cape, South Africa (Source: Google Images, 2020)

Service Delivery Protests: A Result of Prolonged Poor Service Delivery

The slow pace and lack of quality service has fuelled protests all over the country and have brought local government under the spotlight (Managa 2012). The protests are characterised by high levels of violence, looting, xenophobic attacks and police brutality (Alexander, Runciman, Ngwane, Moloto, Mokgele and van Staden, 2018). The dissatisfaction of service delivery primarily emanates from informal settlements and metropolitan areas around the country (Breakfast, Bradshaw and Nomarwayi,

2019). There is a large service delivery gap between rural and urban areas specifically in the former homeland areas of Limpopo, Eastern Cape, Northwest and KwaZulu-Natal (Matebesi and Botes, 2017). As a result, service delivery dissatisfaction is more widespread and not restricted to municipalities or wards with the worst service delivery backlogs (Kotze and Taylor, 2010; Ngcamu, 2019).

The South African government has experienced an outcry in the past from various communities across the country concerning the lack of provision of services (Alexander *et al.* 2018; Ngcamu, 2019). Service delivery protests in South Africa are to an extent the result of current poor living conditions that service delivery was intended to address (Matebesi and Botes, 2017; Twala, 2017). This is supported by Morudu (2017) and Breakfast *et al.* (2019) who identifies declining provisions of basic services such as housing, electricity, sewerage and sanitation, refuse removal, schools and hospitals are a direct cause of service delivery protests around the country, further highlighting that municipalities need to increase the provision of basic services in order to minimise the occurrence of protests. Figure 2.4 depicts a service delivery protest in KwaZulu-Natal, South Africa.



Figure 2.5: Violent Service Delivery Protest in KwaZulu-Natal, South Africa (Source: Google Images, 2020)

Although government should be acknowledged for major infrastructure development initiatives, service delivery performance indicates that progress has been uneven across the country with different issues facing different areas, reflecting variable socio-economic conditions and municipal incompetence (SA Government New Agency, 2017). However, the infrastructure drive in the country is propelled by economic growth imperatives and broader social concerns such as the elimination of poverty and reduction of inequality by 2030. In other words, the country faces a triple infrastructure challenge:

1. To provide infrastructure that stimulates economic growth and job creation,

2. To maintain existing infrastructure,
3. To provide infrastructure and services to the poor in order to eradicate poverty (Financial and Fiscal Commission, 2017).

While it is evident that there are challenges, the government's contribution to the industry plays a vital role in meeting the demands of infrastructure requirements, housing, clinics, hospitals and schools to underdeveloped areas of the country. Kaul (1998) supports this role by indicating since the transformation of the government in 1994, numerous key turn-around strategies (these are discussed in Chapter 3, sections 3.2.4 and 3.2.7) have been implemented towards improving service delivery within the country such as:

- Public Finance Management Act (1999),
- Municipal Finance Management Act (2003),
- Preferential Procurement Policy Framework Act (2000),
- Preferential Procurement Policy Framework Regulations (2017),
- Construction Industry Development Board Act (2000),
- Regulatory Framework for Supply Chain Management (2003),
- National Treasury Regulations (2005),
- Prevention and Combating of Corrupt Activities Act (2004),
- Public Service Commission,
- Department of Public Service and Administration,
- The Infrastructure Delivery Management System (IDMS), and
- The Standard for Infrastructure Procurement and Delivery Management (SIPDM).

Since the SIPDM in 2016, government through National Treasury has implemented the Framework for Infrastructure Delivery and Procurement Management (FIDPM) which forms an integral part of the Model Supply Chain Management (SCM) Policy issued in terms of the Municipal Finance Management Act (MFMA). The issuing of the Model SCM Policy accordingly enables implementation of the FIDPM through the MFMA (FIDPM, 2019).

A study conducted by Emuze and Smallwood (2013) noted that the lack of delivery management skills within public sector establishments could result in the poor execution of projects. In addition, inappropriate organisational culture amongst project team members may lead to resistance to the changes that are necessary for instilling performance improvement.

However, Khumalo *et al.* (2017) identified that the infrastructure delivery model requires a new trajectory in tackling the under-development and triple challenges of poverty, unemployment and slow economic growth. In addition, government as a public entity has a lack of systems for monitoring and

checking resulting in no strict ownership of whatever processes that take place. This emphasises governments initiatives regarding the implementation of the FIDPM as an attempt towards addressing the challenges and performances struggles of service delivery to its citizens.

2.3.5.4 Impacts of the Covid-19 Outbreak on the South African Construction Industry and Public Sector Performance

Covid-19 is a severe acute respiratory disease syndrome which was first identified in Wuhan, China in 2019 and was declared as a public health emergency of international concern by the World Health Organisation (WHO) in January 2020. Thereafter, it evolved into a global pandemic in March 2020 (WHO, 2020).

The South African construction industry drives socio-economic development and key employment opportunities. However, despite fundamental strategic importance, the sector has been negatively impacted by declining infrastructure expenditure and delayed public sector projects (Olaregaju and Ibrahim, 2020).

The construction industry experienced unstable performance in the recent decade and was in trouble well before the occurrence of the corona virus pandemic crisis (World Bank, 2021). A decline in government and private investment has intensified the industries poor performance (Aigbavboa, Aghimien, Thwala and Ngozwana, 2021). Prior to the corona virus pandemic and the country moving into a national lockdown implemented by the president, the construction industry was not classified as an essential service. However, apart from construction works related to public services such as health, water and sanitation and other critical building works, construction works were suspended and gradually resumed through a phased reopening of the economy (WHO, 2020).

The outlook for the future remains positive as the industry is expected to grow by 6.1% in 2021 as Industry output was seriously impacted by the pandemic outbreak and the hardest hit in terms of job losses (Statistics SA, 2021). Despite the current state of the industry during the pandemic, the need for infrastructure service delivery remains (World Bank, 2021). Government has responded by announcing a ten-year infrastructure investment plan in areas including housing, energy, transport, agriculture, transport, water and sanitation including digital infrastructure projects (Aigbavboa *et al.* 2021).

While the covid-19 pandemic outbreak has had negative impacts on the construction industry and further hampered the delivery of critical public services, governments public sector challenges and inefficiencies remain (Aigbavboa *et al.* 2021). Although government has responded to the impact of the pandemic with an optimistic approach for future growth, service delivery implementation through the

FIDPM needs to be closely monitored, performance tracked and reported against stringent timelines (FIDPM, 2019).

2.4 Chapter Summary

This chapter highlighted the public sector as a key driver for the implementation of service delivery in South Africa. The success and failures of the public sector lie in the economic policies and how best government ensures the public sector produces optimal output based on its current resources. Service delivery has been identified as a serious problem as numerous critical challenges are ever present in the public sector. The FIDPM has been identified as governments initiative towards addressing these challenges in an attempt to ultimately improve service delivery in South Africa.

CHAPTER 3 – LITERATURE REVIEW: GOVERNMENT POLICIES, FRAMEWORKS AND THE FIDPM

3.1 Introduction

The South African government has developed key policies and frameworks for addressing service delivery and its challenges since its democracy in 1994. This chapter reviews these key policies and frameworks including the reports on their performance over the last 27 years and further highlights service delivery challenges still present.

3.2 Government Policies and Frameworks

A government is a body of people that work to effectively and successfully guide a unit or community. In addition, government sets and administers policy, using customs, laws, and institutions to exercise political, executive and sovereign power with the intent of managing a state of wellbeing that benefits all aspects of the community unit (Gildenhuys, 1997; Gomme, 1987; Marshall's, 1965; Robson, 1937).

3.2.1 Public Sector Policies in South Africa

A policy is a principle or course of action proposed or implemented by a governing body. Governing bodies are groups of people that act in unison to guide and support a community, unit, business or institution. In addition, policies can take many forms but do share some common features. They are authoritative declarations promoted by a person or body given the power to do so, shape principles and laws, policies also state and influence ways to perform actions and sometimes by whom. Under the best circumstances, the intent of policies is to make the lives of everyone in the community better (Considine, 1994).

Weis (1996) emphasises, a government policy is a rule or principle that intends to better guide decisions, resulting in positive outcomes that enhance the community or unit. Government policies contain the reasons things are done in a certain manner and why. This leads to the development of procedures and protocols to see that policies are conducted in an appropriate manner. Procedures and protocols dictate the how and where and when of how policies will be executed (Weis, 1996).

Public service policies since the new government came to power in 1994 have attempted to deal with the complex needs of the service delivery institutions and service delivery itself. In addition, this had to be done against the background of the unfortunate legacies of the past (White Paper on Transforming Public Service Delivery, 1999). As a result, public service and service delivery policies were designed and promulgated to deal with the simultaneous transformation and quest for improved, service delivery

orientated public service in South Africa (Schwella, 2001). The following is a summary of some of the most important public service delivery policies and initiatives implemented in South Africa:

- The Constitution and Public Administration (The South African Constitution, 1996),
- The White Paper on the Transformation of the Public Service, 1999),
- Project Batho Pele (White Paper on Transforming Public Service Delivery, 1999),
- The Code of Conduct for Public Servants (Public Service Act, 1994).

In addition, other key policies governing public service delivery procurement are highlighted in Table 3.1:

Table 3.1: Key Policies Governing Public Procurement

No.	Key Policy	Policy Description	Source
1	Public Finance Management Act (1999)	Governs financial management practices in South Africa and establishes a regulatory framework for supply chain management within the provincial departments as well as state owned enterprises (SOEs).	PFMA (1999)
2	Municipal Finance Management Act (2003)	Establishes a regulatory framework for supply chain management (SCM) including procurement within municipalities and municipal entities. The MFMA requires each municipality to have and implement its own SCM policy.	MFMA (2003)
3	Preferential Procurement Policy Framework Act (2000)	The PPPFA gives effect to the governments priority of empowering historically discriminated individuals (HDIs) through preferential treatment in procurement activities. The PPPFA entrenches the South African governments commitment to economic growth by implementing measures to support industry generally and specifically to advance the development of both small, medium and micro-sized enterprises (SMMEs) and HDIs.	PPPFA (2000)
4	Preferential Procurement Policy Framework Regulations (2017)	Controls the implementation of the PPPFA and outlines the point system for evaluating tenders. Specifically, a preference point system of 80/20 or 90/10 applies in awarding all public procurement tenders. For contracts valued from R30,000 to R50Million, 80 evaluation points are allocated to price and 20 points for the suppliers' preferential procurement compliance with black economic empowerment (BEE). For values over R50Million, the allocations become 90 points for price and 10 points for BEE. The total scores for price and BEE preference are added to the overall score in the bid evaluation process.	PPPPFR (2017)
5	Construction Industry Development Board Act (2000)	Companies who tender for public sector construction contracts must comply with the CIDB (Act 38 of 2000). The Act defines the construction industry as the broad conglomeration of industries and sectors which add value in the creation and maintenance of fixed assets within the built environment.	CIDB (2000)
6	Regulatory Framework for Supply Chain Management (2003)	Recognizing the need to reform the procurement system further and align it with international best practice and also to improve financial management, the Cabinet approved the Supply Chain Management Policy. The policy is applicable to national and provincial departments while the MFMA (2003) covers the supply chain management functions of local government authorities.	RFSCM (2003)
7	National Treasury Regulations (2005)	Reinforces the provisions of the PFMA and MFMA and finalizes the devolution of the supply chain management function to the accounting officers and formalise the integration of various functions into a single supply chain management function. The National Treasury ultimately retain the constitutional mandate and responsibility to develop norms and standards for public sector procurement. While provinces are then able to develop their own policies and procedures, they must fall within the Treasury's legislative and regulatory framework.	National Treasury (2005)
8	Prevention and Combating of Corrupt Activities Act (2004)	Makes corruption and related activities an offence and establishes a register to place restrictions on persons and enterprises convicted of corrupt activities relating to tenders and contracts. The Act places duty on certain persons holding a position of authority to report corrupt transactions related to the procurement function.	PCCAA (2004)

3.2.2 Implementing Service Delivery through Public Procurement

Procurement is the process which creates, manages and terminates contracts and is concerned with activities that both precede and follow the signing of a contract. It is common practice in countries for public sector procurement to be regulated through a legal framework (Bolton, 2007).

A public sector framework is a conceptual structure and set of rules that outlines how an organisation is managed and controlled. It is a guidance system composed of standard management practices within the government framework designed to suit the organisation (Talbot and Jakeman, 2008). Good governance frameworks should be developed for all new government bodies and programmes including departments, state owned corporations and other non-departmental government agencies both at general level for each major project being managed by the agency. Public sector good governance frameworks are built upon six underlying principles: accountability, transparency and openness, integrity, stewardship, efficiency and leadership (Mcbride and Reinecke, 2012).

Public procurement is widely defined as the purchasing, hiring or obtaining any contractual means, goods, construction works and services by the public sector (Odhiambo and Kamau, 2003). More specifically, public procurement refers to the government activity of purchasing the goods and services needed to perform its functions (Arrowsmith, 2010).

Public procurement operates in an increasingly intense environment which is scrutiny driven by technology, programme reviews including public and political expectations for service improvements (Eyaa and Oluka, 2011). In South Africa, procurement is of particular importance in the public sector and has been used as a policy tool due to the inequitable and unfair practices during apartheid (Bolton, 2006). As a result, procurement is central to the government service delivery system and promotes aims which are secondary to the primary aim of procurement which include using procurement to promote social, industrial or environmental policies (Cane, 2004). Prior to 1994, public procurement in South Africa was aimed towards large and established contractors, making it difficult for new contractors to participate in government procurement procedures. However, public procurement has since been granted constitutional status and is a recognised means of addressing past discriminatory policies and practices (Bolton, 2006).

The South African Constitution of the Republic of South Africa (Act 108 of 1996) allows public procurement policy to provide for categories of preference in the allocation of contracts and the protection or advancement of persons or categories of persons, disadvantaged by unfair discrimination. South Africa has subsequently become known for its use of procurement preferences as affirmative action to advance the economic status of groups who had suffered discrimination under apartheid (National Treasury, 2016).

Figure 3.1 highlights the legal parameters which define the operational framework for public procurement in South Africa. In addition, the Public Finance Management Act (1999) marks the transition to a decentralised procurement system, managed by accounting offices in the national and provincial departments. Furthermore, it also governs the timing and content of public budgets. While the subsequent Municipal Finance Management Act (2003) establishes the regulatory framework for municipalities including Supply Chain Management (SCM) functions. These and other legislation enforce the implementation of procurement systems that are fair, equitable, transparent, competitive and cost effective (International Institute for Sustainable Development, 2014; National Treasury, 2016).

The Constitution of the Republic of South Africa (1996)		Procurement systems must be: 1. Fair 2. Equitable 3. Transparent 4. Competitive 5. Cost-Effective
The Public Finance Management Act (1999)	Preferential Procurement Policy Framework Act (2000)	
The Municipal Financial Management Act (2003)		

Figure 3.1: The Framework Governing Public Sector Procurement in South Africa (International Institute for Sustainable Development, 2014: 6)

The Preferential Procurement Policy Framework Act (PPPFA) prescribes the framework within which preferential procurement policies may be implemented. In terms of the PPPFA, an organ of state must determine its preferential procurement policy and implement it within the framework established by the Act. In addition, this framework prescribes that preference points may be allocated for specific goals, such as contracting with persons or categories of persons, historically disadvantaged by unfair discrimination on the basis of race, gender or disability. In South Africa, all government procurement takes place within this framework (PPPFA, 2000).

A further key piece of legislation is the Broad-Based Black Economic Empowerment Act (B-BBEE Act) which empowers the Minister of Trade and Industry to issue codes of good practice on black economic empowerment that may include, qualification criteria for preferential purposes for procurement and other economic activities. The B-BBEE Act requires every organ of state and public entity to apply any relevant code of good practice issued in terms of the B-BBEE Act in developing and implementing a preferential procurement policy (B-BBEE, 2003).

Lastly, the Promotion of Administrative Justice Act (PAJA) provides for the judicial review of administrative action, which includes almost all government procurement decisions, and sets out both the codified grounds for review and established remedies. Those procurement decisions falling outside

the sphere of the PAJA may be reviewed in terms of the constitutional principle of legality, which constitutes a component of the rule of law (PAJA, 2000).

Recent policy developments have been aimed at placing greater support on public procurement as a tool for achieving economic transformation and addressing socio-economic inequalities deriving from South Africa's pre-democratic past. In addition, the policies aim to use public procurement as a lever to promote socio-economic transformation, empower small enterprises, rural and township enterprises including designated groups and to promote local industrial development (Davey and Gatenby, 2017)

3.2.3 Public Procurement Challenges in South Africa

An important tool for managing public sector procurement in South Africa is Supply Chain Management also known as SCM. SCM is an important part of careful financial management in the South African public sector management (Office of Governance and Commerce, 2005). In addition, SCM operates within a regulatory framework which is set by the national government and extended by provinces and local government bodies to specific policies, legislations and regulations (Hanks, Davies and Perera, 2008). Furthermore, SCM aims to add value at each stage of the procurement process, and finally after use, to their disposal (National Treasury, 2003).

SCM has been identified a fundamental part of procurement in the South African public sector and is used as a tool for the management of public procurement practices. However, despite the utilising SCM as a strategic tool, there are still challenges in public procurement in South Africa, which include:

- *Lack of proper knowledge, skills and capacity* – despite government efforts to implement training and development workshops, public servants still lack appropriate knowledge for adequate implementation of procurement processes, resulting in bad governance (National Treasury, 2005; Mahlaba, 2004).
- *Non-compliance with SCM policy and regulations* – the lack of appropriate bid committees and non-adherence to the preference points system including the use of unqualified suppliers and incorrect procurement processes and procedures are the result of appointing bid committee members not aligned to policy requirements (Luyt, 2008; Sheoraj, 2007).
- *Inadequate planning and linking of demand to the budget* – the absence of specialist skills in government entities for reliable cost-effective buying requirements, inappropriate contract strategy implementation and not being able to secure the best deals at the right time and place has resulted in the improper tracking, control and reporting on expenditure by government entities (Migro and Ambe, 2008; Soudry, 2007).

- *Accountability, fraud and corruption* – this has cost tax paying citizens hundreds of millions of rands every year. As a result, special legislation has been promulgated within departments to address and deal with increased corruption and misuse of funds (McCarthy, 2006).
- *Inadequate monitoring and evaluation of SCM* – has resulted in government entities providing poor governance and unaccountable public policies which is linked to a poor control environment, allowing deviations and non-compliance to go undetected and is mostly identified after the fact (Jeppesen, 2010; Mathee, 2006).
- *Unethical behaviour* – the lack of compliance and application of the prescribed policy guidelines including a conflict of interest and ethics significantly impact SCM implementation negatively (Van Zyl, 2006)
- *Too much decentralisation of the procurement system* – this has led to poor contract management and supplier relationship management including numerous cases of tender fraud and lack of all levels of services of government, resulting in not providing the best value for taxpayers' money (Ambe and Badenhorst-Weiss, 2012; Handfield, Monczka, Guinipero and Patterson, 2011).
- *Ineffectiveness of the black economic empowerment (BEE) policy* – this has resulted in imposing significant costs to the economy without providing employment creating and growth, as initially intended (Acevedo, Rivera, Lima and Hwang, 2010; Stemele, 2009;).

Against this background, it is evident that public procurement practitioners in South Africa require specific knowledge about the procurement objective, SCM policy and preference procurement policies in order to manage the procurement process effectively. Specialised training programmes are required to equip public sector officials with the skills to achieve procurement objectives. Key issues such as employment of qualified procurement practitioners, training and employment of learnership programmes, development of an effective monitoring and evaluation tool, and the creation of incentive programmes to motivate good performance should be employed (Ambe and Badenhorst-weiss, 2012; Bolton, 2006).

3.2.4 Historic Overview of Challenges in Implementing Key Frameworks and Policies

Figure 3.2 presents a timeline of the performance measurement reports on key policies and frameworks implemented to address public service delivery by government since 1994, and each will be discussed individually.

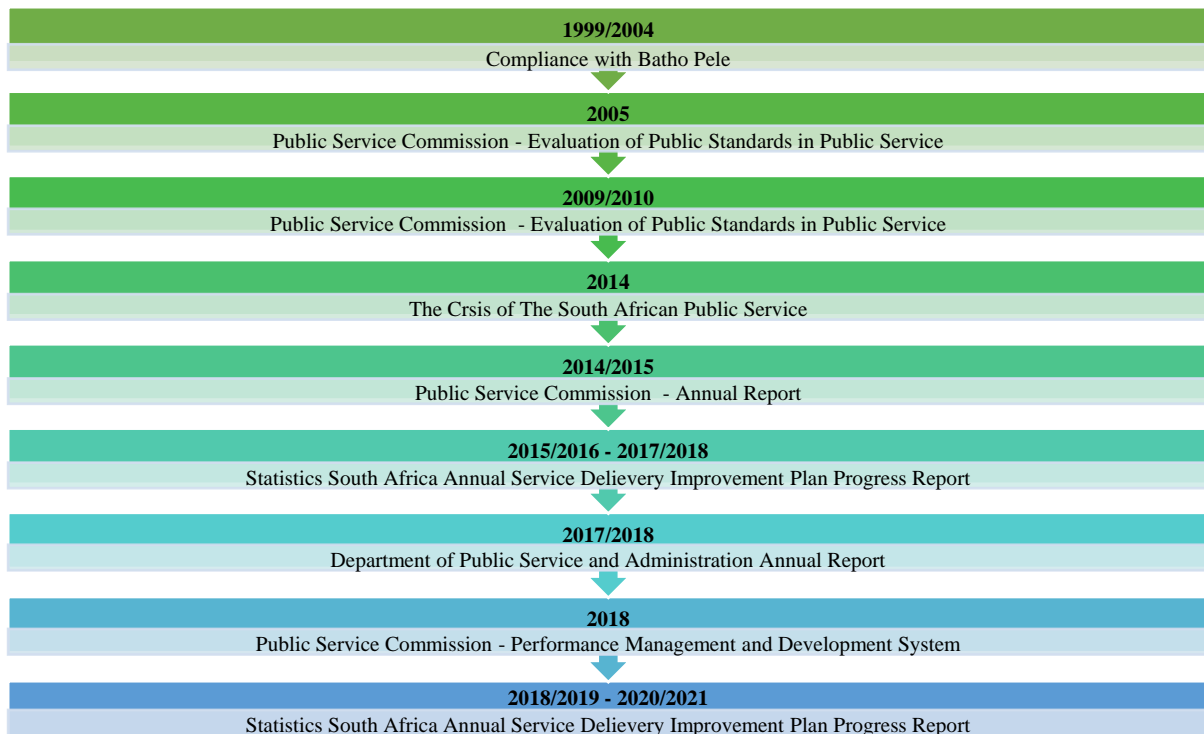


Figure 3.2: Timeline of Performance Measurement Reports

3.2.4.1 Compliance with Batho Pele – 1999/ 2004

During the period October 1999 to February 2000 the Public Service Commission (PSC) conducted a survey with the aim of establishing the extent to which government departments were compliant with implementing Batho Pele (PSC, 2000). The survey identified the following challenges:

- The public service was lacking in skills necessary for the application of Batho Pele principles,
- The service delivery transformation programme was seen as separate from the day-to-day business department,
- Demands for improved as well as new services were imposed on service delivery units without the consideration of cost implications,
- Batho Pele was a mere listing of principles, without any indication of implementation,
- The Batho Pele policy had not impacted on the daily tasks of front-line personnel,
- Batho Pele had not been integrated with performance management and strategic plans (PSC, 2000).

Furthermore, the survey suggested that the fundamentals were not in place for Batho Pele to succeed with public service delivery. These fundamentals included attitudes, beliefs, skills, structure, systems and processes which needed to be integrated with any major transformation initiative, such as Batho Pele (Batho Pele Policy Review, 2003).

In October 2004, President Mbeki queried with Cabinet Ministers whether the South African public service was capacitated, organised and resourced in order to deliver on government's socio-economic objectives in the context of a developmental state (PSC, 2008). In response, the Forum of SA Directors-General (FOSAD) Report (2005) identified that:

- Organisational structures were designed to create posts rather than job purpose or function,
- The span of control was extremely uneven across departments,
- There was a poor understanding of responsibilities in policy making,
- Insufficient considerations were given to service delivery models,
- There was a duplication of roles and functions such as supply chain management, and
- Monitoring and evaluation was neglected (PSC, 2008)

3.2.4.2 Public Service Commission - Evaluation of Service Standards in the Public Service - 2005

Improving service delivery is a continuous process for public sector departments and not a once off task. It calls for a shift from inward-looking bureaucratic systems, processes and attitudes to searching for new ways of working that will give priority to the needs of the client. The PSC monitors the level and quality of government services and promotes a culture of access, openness and transparency towards building confidence and trust between the public service and the public it serves. The PSC further evaluates the performance of departments with regard to implementing service standards in accordance with the Batho Pele White Paper on Transforming Public Service Delivery (PSC, 2005). The main findings of the PSC (2005) report with regards to challenges were:

- No service standards in departments,
- Poorly defined service standards making them difficult to measure.
- Significant confusion existed between service standards and service delivery indicators.
- Service standards were not readily available to clients and therefore clients were unaware of the level of service that could be delivered.
- Too much emphasis was placed on the responsibilities of government departments and very little emphasis was placed on the responsibilities of the clients who access services.
- Service standards were sometimes unachievable leading to clients having overstated expectations regarding service delivery.
- Members of staff were often unacquainted regarding their departments service standards and as a result, were unaware of whether services were delivered to the standards set by their department.
- Departments had rigid and uniform service standards across the whole department which took no account of local or service variations.
- Poor understanding within some departments that considerable effort was required, beyond simply defining service standards, to implement the concept.

- Not linking the concept of service standards with current initiatives to reform the public service such as the Batho Pele principles (PSC, 2005).

Several critical challenges remain through the development and use of service standards to assess service delivery. Two of the greatest challenges are the measurement of performance regularly and using information gathered. In order to develop robust service standards, departments and the programmes implemented must first have a sound strategic plan where goals and objectives are clearly defined including effective measures of programme success (PSC, 2005).

3.2.4.3 Public Service Commission - Evaluation of Service Standards in the Public Service – 2009/2010

The PSC tailored its service delivery assessments to be in line with the 2010 State of the Public Service Report theme (integration, coordination and effective public service delivery). In addition, it noted that effective service delivery can take place where there is integration and coordination, and government alone can never have adequate resources to successfully meet all the needs of its citizens. It was therefore highlighted that resource mobilisation be conducted through integrated and coordinated manner to ensure sustainable service delivery (PSC, 2010).

During the period under review, the PSC report covers the period 2000 to 2009 which encompassed 101 public sector departments. The report covered a significant sample of the public service and applied a consistent measure of the quality of public administration over time. Furthermore, the report showed that through the levels of compliance with a range of prescribed administrative practices including service levels, there was a slow and steady improvement in the quality of administration indicating good institutional systems were being built. The report indicated from 2005/2006 onwards, real improvement in the performance of public sector departments were achieved, from 48% in 2006/07 to 56% in 2008/09. Although a small improvement, it was viewed as significant because of the steady upwards trend. This finding was contrary to the general perceptions of poor service delivery and performance of the Public Service (PSC, 2010).

3.2.4.4 The Crisis of the South African Public Service - 2014

In 2014, the public service consisted of more than 1.6 million employees, spread across all spheres of government creating a heavy state wage bill of at least 11.5% of GDP and was expected to increase. This was nearly three times that of either South Africa's BRICS (Brazil, Russia, India, China and South Africa) partners and larger than the UK or USA. Due to high unemployment rate and a relatively small tax base, this was unsustainable. The need for training 10,000 senior managers and 250,000 junior

managers in all spheres of public service, despite contributions from many sources in the public, private, civil society and academic sectors has not been met (Schussler, 2012).

The Reconstruction and Development Program (RDP) committed to an extensive program of Affirmative Action, including training and support, stating that within two years of implementation, recruitment and training should reflect South Africa in terms of race, class and gender (RDP, 1994). Despite warnings of the need to support those appointed, the training and support assured was rarely forthcoming, nor was the situation sufficiently managed or monitored. Furthermore, the concept of potential became a favoured loophole through which family, friends and comrades were advantaged over more competent applicants (Franks, 2014).

Policy was biased, firstly at the level of formulation by an over reliance on foreign models, romantic ideas and a failure to develop truly contextual policies. Secondly, in implementation, where particular interpretations and interests have distorted the original intentions and spirit of these policies. The entire process of change in the public service has been bedevilled by a conflict between the need for an efficient, professionally and technically competent and politically neutral public service, on the one hand and the desire for political alignment, cultural change and patronage on the other. Both themes were present in an incoherent and confused process (Franks, 2014; Hoffman, 2010).

During the African National Congress Conference of 2012, which was later reaffirmed by the National Development Plan, it was emphasised that proper training, orientation and leadership of the public service and the state's ability to translate broad objectives into programmes and projects to ensure their implementation (ANC, 2012). The National Planning Commission further identified that deeply rooted systemic issues which require long term and strategic approach to enhancing institutional capacity. The commission noted that a set of interrelated issues including instability resulting from repeated changes in policy under staffing and skills shortages, obstacles to building a sense of professional common purpose in the public service, political interference, a lack of accountability and insufficient clarity in the division of roles and responsibilities (National Planning Commission, 2011).

In 2013 the DPSA issued a strategy for the management of poor performance of the senior management system in response to reports of incompetence and inconsistency in managing performance. The Presidency, PSC, DPSA and Premiers' offices identified poor performance and were required to provide half yearly reports on disciplinary steps taken against Director Generals (DGs) and Heads of Departments (HoDs) to the DPSA. This created an over lapping display of both oversight and accountability (Muthien, 2013). Furthermore, the Auditor-General (AG 2011/2012) identified four key factors underlying the deterioration in clean audits:

- Lack of leadership commitment,
- Vacancies in key positions,

- Instability in leadership positions, and
- Ineffective performance management.

As a result, government found itself immersed in unintended consequences of unaccountability, corruption and particularism rooted in public service and the State. Two decades of force deployment and redeployment, inadequate training, management and discipline and the increasing evidence of corruption of public funds and processes, were met by increasing service delivery protests and a breakdown of the labour relations system. It was a critical moment in South Africa that if the public service issues faced were not confronted, they will continue to undermine the technical and legal efforts to deal with symptoms of poor management (Clapper, 2007; Franks, 2014).

3.2.4.5 Public Service Commission – Annual Report for 2014/ 2015

During the period 2014/ 2015, government adopted the developmental state model as the primary development agenda for the country. This was based on the recognition that to overcome the triple development challenges of unemployment, poverty and inequality, and to transform the structural basis of the economy requires a developmental state. The PSC has a central role in shaping the kind of public administration and public service that will help South Africa achieve its developmental goals (PSC, 2015; PSC Conference Report, 2014).

To inform decisions regarding service delivery and ensure effective and efficient public service, the PSC conducted service delivery inspections to assess the quality of services rendered by departments. It was identified that corruption continued to undermine development efforts and hindered sustainable development. Public perception and concern around the abuse of public resources increased. The complexity and scope of complaints regarding public service received grew. In most cases where complaints were lodged, departments did not submit the required information within the stipulated time frame, resulting in delays in the timely finalisation of investigations (PSC, 2015).

3.2.4.6 Statistics South Africa – Annual Service Delivery Improvement Plan Progress Report 2015/ 2016 – 2017/ 2018

Statistics South Africa (Stats SA) is a national government department reporting to the Minister in the Presidency. The activities of the department are regulated by the Statistics Act, 1999 (Act No. 6 of 1999). It is the official statistics agency in South Africa, and the producer of key national economic, social and population indicators. Statistics are vital for planning, good governance, policy formulation, monitoring and evaluation, and for decision making. Better statistics and better information lead to better decisions and better policy outcomes. Stats SA's Service Delivery Improvement Programme (SDIP) aims to provide a focused approach to continuous improvement of key services and products in

line with Batho Pele principles, which serve to ensure effective and efficient service delivery by putting people first (Stats SA, 2018).

Vision 2030, outlined in the NDP stated that if the public sector is to address the triple challenges of poverty, inequality and unemployment, a state is needed that is capable of playing a transformative and developmental role. This required a well-run and effectively coordinated state institutions, staffed by skilled public servants who are committed to the public good and capable of delivering consistently, high quality services for all South Africans, while prioritising the nation's developmental objectives. In addition, the Medium Term Strategic Framework (MTSF) further states that improvements in service delivery needed to be complemented by effective accountability to citizens. The responsiveness of the public service to citizens and stakeholders will be improved through the revitalisation of the Batho Pele programme and implementation of the Public Service Charter (Stats SA, 2018).

It is clear, more than two decades since democracy, government are still implementing pilot studies to improve service delivery in the public sector from a principle (Batho Pele) developed in 1997.

3.2.4.7 Department of Public Service and Administration - Annual Report for 2017/ 2018

The Department of Public Service and Administration (DPSA) is responsible for providing support to departments to improve the quality and implementation of their Service Delivery Improvement Plans (SDIPs). Concerns were raised by the DPSA as 15 out of the 161 departments did not submit their SDIPs in the 2015/18 cycle despite the support provided over the past 5 years. In addition, there was poor submission of the annual SPIP progress implementation reports between 2013 to 2017. In preparation for the 2018/21 SDIP cycle the DPSA provided support to 144 out of 161 departments including further support to departments that did not submit their SDIPs and did not meet the minimum standards. Moving forward, an integrated approach in the provision of support efforts to departments was followed in terms of the Service Delivery Model, business process mapping and re-engineering, Standard Operating Procedures (SOPs), service standards and the SDIPs (DPSA, 2018).

As an initiative to revitalise and monitor adherence to the Batho Pele programme (improving attitudes, being courteous, and responsiveness) the departments of Basic Education, Health, Human Settlements, Labour, Social Development and Transport were supported to develop standards for Batho Pele principles. The aim of developing Batho Pele standards was to improve service delivery measurement and performance, increasing government officials' responsiveness to citizen's needs. Improvement in the public servant's behaviour and attitudes should lead to improved responsiveness to citizen's needs. The DPSA conducted a survey on other departments which identified that the rest of the public service did not implement Batho Pele principles (DPSA, 2018).

Government has consistently prompted programmes and platforms that create space for engagement and reflection aimed at finding collective solutions to the continued global challenges of poverty, unemployment and inequality. To respond to this call, the Ministry participated in a community outreach programme such as Batho Pele – Putting People First programme. The programme aimed at responding to service delivery challenges experienced by the community. Some of the outreach programmes conducted included visits to state facilities where observations were made to determine if government was achieving the required service standards intended to meet the needs of South Africans (DPSA, 2018).

As part of the service delivery improvement effort, the 2014 – 2019 MTFS identified the development of Batho Pele standards as one of the key priorities. The aim of these standards was to improve service delivery through increasing government officials' responsiveness to citizens' needs. The generic Batho Pele standards have been developed and are being piloted in the national Department of Basic Education, the Department of Health, the national Department of Human Settlements, the Department of Labour, the Department of Social Development and the Department of Transport (DPSA, 2018).

Batho Pele, an initiative launched in 1997 by the government to transform the public service and only being piloted in 2018 (21 years later) through the identified departments highlights the inconsistencies and lack of adherence to policy by public servants.

3.2.4.8 Public Service Commission – Performance Management and Development System – 2018

The performance of the public service remains one of the key concerns for the PSC. The Performance Management and Development System (PMDS) is an important part of the public service regulatory framework which guides the work and conduct of public servants in delivering services to the public. The main aim of the PMDS is to improve service delivery through effective and efficient application of resources (Zvavahera, 2014). In the South African public service, the PMDS was introduced in July 1999 following the signing of the Resolution 13 of 1998 and became effective from April 2001.

A coherent and effectively implemented PDMS aims at building a culture of high performance, trust and mutual understanding by communicating clear expectations, defining roles, responsibilities and accountabilities, standards within required competencies and the expected behaviours and establishing achievable key result areas and performance indicators (Janudin and Maelah, 2016, MSG 2017). In addition, the PMDS process is used to identify the strengths and weaknesses of employees for developments as contemplated in the Skills Development Act, 97 of 1998 (Ngubane, 2013). The PMDS process is further used for identifying and separating poor performers from good ones for the purposes

of instituting corrective measures to change behaviour. The following principles are central to the PMDS:

- Enable employees to work towards the achievement of exceptional standards of work performance,
- Help employees identify the knowledge and skills required for performing the job efficiently to drive their focus towards performing the right task in the right way,
- Boost performance of employees by enhancing employee empowerment, motivation and implementation of an effective reward mechanism,
- Promoting a two-way system of communication between supervisors and employees enabling clarification of roles, expectations and accountabilities, communication functional and organisational goals including provision of regular and transparent feedback to improve employee performance through continuous training, and
- Identify barriers to effective performance and resolve those barriers through constant monitoring, coaching and development interventions (PSC, 2018).

The PSC is mandated in terms of the constitution to monitor and investigate adherence to applicable procedures, propose measures to ensure effective and efficient performance and advise national and provincial organs of state regarding personnel practices in the public service. The PSC has conducted various studies on the implementation and compliance of the PMDS which highlighted that it is a complex system which its effectiveness is dependent on the collective efforts of multiple stakeholders (PSC, 2018). Key findings were:

- Various challenges have resulted in poor performance and had a negative impact on productivity and workplace effectiveness,
- The challenges include failure by some departments to address poor resulting in resentment and impacted negatively on those employees who are performing satisfactorily,
- Departments are guided by government's commitment as set out in the NDP,
- The effectiveness of the PMDS was negatively impacted by a range of challenges, including non-compliance with basic administrative requirements, contracting deadlines, inconsistent practices with assessments, allegations of subjectivity and misuse of the system by supervisors as a disciplinary or reward measure, and
- PDMS units in the selected departments did not have capacity and some managers did not take the system seriously or avail themselves for training (PSC, 2018).

The PMDS may be rendered useless without the existence of proper people management, monitoring and evaluation, supervision and operational management systems as in the case with most public service

departments. South Africa's vision of becoming a developmental state needs to be supported by robust performance management. The PMDS should, in terms of its design and implementation, contribute towards the realisation of short, medium and long term strategic goals and objectives of government (PSC, 2018).

3.2.4.9 Statistics South Africa – Annual Service Delivery Improvement Plan Progress Report 2018/19 – 2020/21

The Department of Public Service Administration (DPSA) to drive transformation and service delivery improvement in the public sector has developed the White Paper on Transforming Public Service Delivery as early as 1997. The white paper is about service delivery improvement through Batho Pele Principles. It follows a systematic consultative approach with the public service, to gather information on whether set service standards are met in practice. The DPSA reviewed and amended the Public Service Regulations (PSR) in 2016. An Operations Management Framework (OMF) was introduced which offers a service delivery improvement platform for public sectors to effectively deliver goods and services to all citizens as planned in the NDP, the MTSF including sector plans, using available resources (Stats, SA SDIP Report, 2019).

The President of South Africa, Cyril Ramaphosa noted in the State of the Nation Address (2018) that: *“Our state employs one million public servants. The majority of them serve our people with diligence and commitment. We applaud them for the excellent work they do. However, we know the challenges that our people face when they interact with the state. In too many cases, they often get poor service or no service at all. We want our public servants to adhere to the principles of Batho Pele, of putting our people first.”* (President Cyril Ramaphosa, 2018).

Since the President took office, capacity has been built in the Presidency and elsewhere in the State to fast-track progress on a clear list of urgent reforms. A Project Management Office (PMO) has been established including the Infrastructure and Investment Unit and Research Services to address obstacles to reform and improve government delivery. It was further noted that these units are working closely with the Presidency Infrastructure Coordinating Commission, Invest SA and the Ease of Doing Business Task Team to remove barriers to investment and growth and ensure that government demonstrates visible progress quickly (President Cyril Ramaphosa, State of the Nation Address, 2020).

Public service delivery improvement and public sector reform has been identified as a process of continuous improvement. However, literature highlights this is not evident in South Africa. Despite government efforts to transform public service, service delivery challenges are still present. Government needs to eliminate the barriers preventing improved service delivery.

3.3 Eliminating Barriers to Improve Engagement in Public Sector

The Supply Chain Management (SCM) Review Update 2016 prepared by National Treasury (2016) notes that SCM intended improving efficiency and the effectiveness of government spending through the support of electronic systems.

However, these electronic systems were fragmented and underutilised as many supply chain activities are still conducted manually. Numerous SCM technological innovations were implemented through a phased approach since 2015 and have become compulsory since April 2016, which aimed to:

- Reduce the challenging administrative load for government and business,
- Improve reliable reporting of procurement data,
- Provide an intelligent analysis of procurement data including enhancing SCM sourcing strategies, and
- Ensure efficient monitoring of procurement patterns, contracts and prices (National Treasury, 2016).

The technological innovations highlighted by National Treasuries SCM review update included:

- *Central Supplier Database* – to engage in business with government, suppliers register once. The system automates the verification of statutory documentation which has reduced the cost of doing business as suppliers no longer incur costs of acquiring administrative documents and register on various databases individually (National Treasury, 2016).
- *eTender Portal* – the portal enhances transparency with the intent of reducing corruption and tender disputes. In addition, the system enables bid documents, list of tenderers and prices including bid winners and the scores of all bidders, to be made available to bidders free of charge on a single platform that is searchable and accessible throughout the year (National Treasury, 2016).
- *gCommerce* – the government Commerce platform was launched in 2015 and was designed for government buyers to easily purchase centrally negotiated contracts (National Treasury, 2016).
- *eProcurement* – a uniform platform for quotations (purchases under R500 000 at national and provincial, and R200 000 at local government through a three-quote system) was introduced in 2016/ 2017 which is still used in 2021. The platform created transparency on the quotation system process and aimed to stabilise prices for categories of goods including services and to generate a reliable pricing referencing system. In addition, the rotation ability of the system enhances supplier brackets in a fair and transparent manner. Furthermore, the previous paper-based system was inefficient and the single largest source of corruption (National Treasury, 2016).
- *30 Day Payment Problem* – the non-payment of suppliers on time has adverse effects on business and the economy, and simultaneously results in inflated prices as suppliers transfer the

cost of non-payment to the government. Suppliers who have not been paid may report the matter to the Office of the Chief Procurement Officer (OCPO), who has measures in place to ensure the payments of outstanding creditors. In addition, non-transfer of funds to government departments are implemented should their contractual obligations not be met (National Treasury, 2016).

- *Support for Small Medium and Micro Enterprises (SMMEs)* – SMMEs play a vital role in growing the economy and creating jobs. OCPO has reviewed the PPPFA Regulations to accommodate requirements for supporting SMMEs, township and rural businesses, youth and women owned businesses and localisation. This aims to empower opportunities for SMMEs to access government business opportunities (National Treasury, 2016).

National Treasury (2016) SCM review further indicated that:

- Government implemented strategies would result in increased financial savings,
- Public procurement was used to stimulate the economy and continue to create opportunities for growth,
- Eliminate careless spending, eradicate waste and implement measures to contain costs to improve efficiency in spending programmes,
- Government will reduce red tape barriers for conducting business with the state and establish mechanisms to engage with stakeholders in public procurement (National Treasury, 2016).

Furthermore, government noted that to address inefficiencies in infrastructure delivery, infrastructure reforms would aid towards reducing costs:

- National Treasury Standard for Infrastructure Procurement and Delivery Management System (SIPDM) issued during November 2015 in line with the National Development Plan aimed to set out the minimum requirements for infrastructure related procurement supported by a control framework that institutions could be audited against,
- Due to overdesigns and abnormal project costs, consultants' percentage-based fees would be reduced,
- Implementing minimum norms and standards for health facilities including cost ceilings for construction,
- Improving quality and cost effectiveness through closely monitoring projects via transparency in infrastructure procurement. This would be achieved by monthly procurement reports issued to National Treasury,
- Expanding framework contractors for infrastructure delivery including greater transparency as part of the monitoring system (National Treasury, 2016).

However, the literature has highlighted through the review of the DPSA annual report between 2017 to 2018, Statistics South Africa annual Service Delivery Improvement Plan progress report between 2015 to 2016 and 2017 to 2018, the PSC performance management and development system conducted in 2018 and Statistics South Africa annual Service Delivery Improvement Plan progress report between 2018 to 2019 and 2020 to 2021 government has not achieved its efficiency and effectiveness targets proposed in 2016.

3.4 The Standard for Infrastructure Procurement and Delivery Management (SIPDM) and Service Delivery Challenges Still Present

3.4.1 The SIPDM

In 2011 the National Planning Commission published a detailed report setting out the key challenges confronting South Africans in fighting poverty and inequality and in achieving constitutional objectives. The conclusion of the report highlighted that a business-as-usual approach results in South Africa failing to meet many of its public service objectives. With the publication in 2012 of the National Development Plan 2030: Our future – make it work, it was clear that an infrastructure delivery system was needed focusing on prioritising, planning, allocating and measuring. As a result, National Treasury developed the Infrastructure Delivery Management System (IDMS) as a model for best practice delivery of infrastructure management within the public sector (SIPDM, 2016).

There is a relationship between socio-economic growth, development and infrastructure delivery. The delivery of basic public services depends as much on the people and the institutions delivering the services as on the physical works they use. It is not enough just to have money. It is one thing to build a school, but quite another to build the right school within budget, on time, to the prescribed quality standard and be able to maintain it (SIPDM, 2016). As a result, the issuing of the Treasury Instruction in terms of the Public Finance Management Act (PFMA) and the circular for the Model SCM Policy for Infrastructure Procurement and Delivery Management establishes a common approach to infrastructure delivery across all organs of state in all spheres of government (SIPDM, 2016).

In support of the supply chain for infrastructure procurement and delivery management for general goods and services, in November 2015 National Treasury issued two documents:

- An instruction in terms of Section 76(4)(c) of the PFMA (Act 1 of 1999) which required the implementation of the Standard for Infrastructure Procurement and Delivery Management (SIPDM) by all organs of state subject to the PFMA, with effect from 01st July 2016.
- A Model Supply Chain Management Policy for Infrastructure Procurement and Delivery Management in terms of Section 168 of the MFMA (Act 56 of 2003) in support of the MFMA

SCM regulation 3(2) as a National Treasury guideline determining standards for municipal SCM policies (SIPDM, 2016).

The Council for the Built Environment (CBE), the Construction Industry Development Board (CIDB), the South African Institution of Civil Engineering (SAICE), the Consulting Engineers of South Africa (CESA), the South African Forum of Civil Engineering Contractors (SAFCEC's), the Institute of Municipal engineering of Southern Africa (IMESA's) and the South African Institute of Electrical Engineers (SAIEE's) have adopted the SIPDM in 2016 as a positive initiative towards addressing governments service delivery challenges amongst many others. These bodies and councils collectively noted the following regarding its implementation:

- Stakeholders would benefit from clear processes, procedures and frameworks for the effective delivery of infrastructure projects,
- Strengthen SCM of government infrastructure,
- Aims to establish a professional approach to the service delivery continuum, and ensure the process is properly managed and controlled, and
- The SIPDM was a well structures professional project management approach to infrastructure procurement (SIPDM, 2016).

The SIPDM intended to establish control frameworks for the planning, design and execution of infrastructure projects and infrastructure procurement requirements for the supply chain management system for infrastructure procurement and delivery management including minimum requirements for infrastructure procurement (SIPDM, 2016).

This standard enabled the separation of the supply chain management requirements for general goods and services from those for infrastructure. The separation of the supply chains aimed for the effective and efficient functioning of the supply chain management system for infrastructure procurement and delivery management to realise value for money and good-quality service delivery. Value for money was regarded as the optimal use of resources to achieve the intended outcomes and an explicit commitment towards ensuring the maximum benefit is achieved from the resources available (SIPDM, 2016).

The SIPDM mapped out the flow for infrastructure procurement and delivery management processes and established several gates linked to documented deliverables where decisions are required to progress to the next activity or process as identified in Table 3.2. These gates enable risks to be proactively managed and facilitate auditing. A control which authorised the proceeding activity with an activity within a process or commencing with the next process is referred to as a gate. Gates provided

a means for directing an organ of state towards what was targeted and confirm conformity requirements (SIPDM, 2016).

Table 3.2: SIPDM Review Gates (adapted from the SIPDM, 2016:11)

Infrastructure Delivery Management System		
Gate	Gate Name	Key End of Gate Deliverable
0	Project Initiation	Accept initiation report
1	Infrastructure Planning	Approve infrastructure plan
2	Strategic Resourcing	Approve delivery and procurement strategy
3	Prefeasibility	Accept strategic brief/ prefeasibility report
	Preparation and Briefing	
4	Feasibility	Accept concept/ feasibility report
	Concept and Viability	
5	Design Development	Accept concept/ feasibility report
6	Design Documentation	6A Production Information
		6B Manufacture, Fabrication and Construction Information
		Accept design development report
7	Works	Accept production and manufacture, fabrication and construction information
8	Handover	Certify delivery or completion of the works
9	Package Completion	Accept close-out report and make final payment

3.4.2 The SIPDM as Component of the Infrastructure Delivery Management System (IDMS)

In 2004 the Infrastructure Delivery Improvement Programme (IDIP) was established as a partnership between National Treasury, the CIDB, the Department of Public Works (DPW) and the Development Bank of South Africa (DBSA) to create a capacity building programme dealing with service delivery failures across provincial departments. Within this programme the concept of the Infrastructure Delivery Management System (IDMS) was created and informed (IDMS, 2014).

The IDMS is government's policy for implementing its strategy to enhance socio-economic growth and development through infrastructure delivery. The IDMS has evolved over the years, in 2002 National Treasury commissioned an independent assessment to understand the reason for infrastructure underspending and constant needs for rollovers by provincial departments. The assessment report identified several gaps and hold points in the infrastructure delivery management chain which identified the following root causes, amongst others:

- Poor planning,
- Lack of skills and inappropriate skills in technical positions,
- Lack of uniformity in procurement procedures, and
- Poor reporting and monitoring (IDMS, 2019).

The report further recommended that a standard, uniform set of processes be developed to guide and structure the delivery and management of infrastructure within the public sector. The legality of the IDMS for application in all spheres of government was endorsed by:

- The nine provincial IDMS framework documents, which have been approved by the provincial EXCO's (endorsing IDMS in each province),
- Sections within the issue of the Division of Revenue Act (DoRA),
- Endorsement of the IDMS by the Presidential Infrastructure Coordination Committees (PICC), and
- The SIPDM issued by National Treasury in 2014 (IDMS, 2019).

The IDMS includes three core systems, namely a planning and budgeting system, a supply chain management system and an asset management system, which all have forward and backward linkages. These core systems are located within portfolio, programme and project management, and operation and maintenance processes. Collectively these processes and systems, together with a performance management system, establish the institutional system for infrastructure delivery. It is noted that the SIPDM does not establish planning and budgeting or asset management requirements, rather it establishes the forward and backward linkages and is a component of the IDMS (SIPDM, 2016).

IDMS Principals and Benefits

The IDMS (2019) identifies the application of seven key principals to ensure the effective development and implementation of infrastructure strategy. These are:

1. Broad ownership,
2. Policy consistency,
3. Planning alignment,
4. Clarity of responsibility and accountability,
5. Evidence-based decision making,
6. Continuous Improvement and scalability, and
7. Continuous capacity and capability building (IDMS, 2019: 19).

Through the effective implementation of the listed principles, the following key benefits are achievable:

- Understanding of delivery and procurement management processes including governance obligations.
- Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.
- Consistent, reliable reporting, based on the full life cycle costs of infrastructure.
- Identification of appropriate delivery options.

- Development of programme plans, using simple templates and guides.
- Alignment of the allocated budgets to infrastructure programmes.
- Identification and prioritisation of projects.
- Improved operations and maintenance management.
- Improved management of the procurement of supplies, services and engineering and construction works.
- Improved management of the planning and design of projects.
- Improved management of procurement and project delivery processes.
- Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.
- Good practice guidelines, within a simple structured system, based upon well-defined processes that are necessary to achieve effective infrastructure delivery.
- Greater level of uniformity of infrastructure project implementation, across different organs of state.
- Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.
- A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.
- Senior management will have a tool to hold delivery managers accountable for performance.
- Reporting of progress, performance and impact will be uniformly documented.
- The quality and value for money of service delivery will improve (IDMS, 2019: 19)

3.4.3 Service and Infrastructure Delivery Challenges Still Present

Government has highlighted the infrastructure plan for expenditure over the next 3 years (2019 – 2022) is positive for South Africa. Key areas for infrastructure spending will focus on building and construction, energy, transport interventions including strengthening capacity to deliver infrastructure projects and creating new infrastructure funding streams. As a result, government needs to ensure that they are geared and ready to implement public sector expenditure in order to roll out the plan for infrastructure development (SA Budget Review, 2019).

However, the SIPDM in its infancy of implementation from July 2017 has not seen its implementation efficiently and effectively as set out in its policy regulation guidelines. Infrastructure delivery in the South African construction industry faces the same challenges regarding poor service delivery of public sector projects (SA Budget Review, 2019).

Public service delivery still exhibits challenges which were raised in previous years regarding capacity and skills shortages with public servants. According to the NDP the main challenge which affects

infrastructure management and delivery has been the unevenness in capacity that leads to uneven performance in local, provincial and national government. This was caused by a multifaceted set of factors, including pressures in political administrative interface, instability of leadership, a skills deficit, poor organisational design, no accountability and authority, and low staff morale. The weakness in capacity and performance are most serious in historically disadvantaged areas, where state intervention is most needed to improve people's quality of life (Provincial Treasury, 2019).

Although the IDMS has made some good progress when implemented through Provincial Treasuries and provincial departments of Health and Education, it has not been sufficiently institutionalised in most departments. The implementation and sustainability of the IDMS stills remains a challenge.

Government through SCM put out a tender in November 2019 by National Treasury requesting for service providers *“to assist and support the Provincial Treasury (PT) in the implementation of the Infrastructure Delivery Management System (IDMS), for a three (3) year contract”*. The purpose of the tender was for suitably qualified and experienced technical service providers to provide support to provincial departments with the sustainable implementation of infrastructure through the IDMS (Provincial Treasury, 2019). Thus, reinforcing governments request for support to address the challenges that have hindered successful service delivery in South Africa going on close to three decades.

The National Treasury Instruction No.3 of 2019/2020 issued and effective from the 01st October 2019 gave legal effect to the Framework for Infrastructure Delivery and Procurement Management (FIDPM) which is applicable to:

- All departments, constitutional institutions and public entities listed in Schedules 2 and 3 of the PFMA and
- Any organ of state, as identified in Section 239 of the Constitution, which implements infrastructure projects on behalf of institutions referred to in (a) (National Treasury Instruction No.3 of 2019/ 2020, 2019).

The Treasury Instruction repealed the National Treasury instruction note 4 of 2015/ 2016:

- Standard for Infrastructure Procurement and Delivery Management that was issued by National Treasury SCM Instruction Note of 2015/ 2016, and
- Model Policy for Procurement and Delivery Management that was issued with National Treasury SCM Instruction Note 4 of 2015/ 2016 (National Treasury Instruction No.3 of 2019/ 2020, 2019).

As a result, this research aims to investigate the barriers to efficient and effective implementation of the FIDPM in the South African public sector towards improving service delivery through the delivery of successful construction projects in the built environment. The next section discusses the FIDPM.

3.5 The Framework for Infrastructure Delivery and Procurement Management (FIDPM)

The South African government has a vision to create opportunities for social and economic growth through infrastructure investment. In 2002, the National Treasury conducted a review of provincial service delivery systems with the intention to enhance infrastructure delivery. A key recommendation from the review highlighted that a framework was to be developed to guide and structure the management of infrastructure delivery. To address the issues and gaps identified in the review, the Infrastructure Delivery Improvement Programme (IDIP) was established. Within this programme, the concept of the Infrastructure Delivery Management System (IDMS) was developed and later adopted as the chosen government wide system for infrastructure delivery (FIDPM, 2019).

In order to establish a common approach to infrastructure delivery across all organs of state, the National Treasury adopted the Standard for Infrastructure Procurement and Delivery Management (SIPDM) (FIDPM, 2019). The National Treasury Supply Chain Management (SCM) Instruction No.4 of 2015/16 issued on the 06th November 2015 gave effect to the implementation of the SIPDM. This instruction required departments, constitutional institutions and public entities listed in schedule 2 and 3 to adapt their institutional instructions, policies and standard operating procedures to the SIPDM and implement by 01st July 2016 (National Treasury, 2019).

However, some organs of state initiated the process to begin implementation and institutionalising the SIPDM. During the implementation process, National Treasury received numerous queries regarding certain fundamental aspects in the SIPDM and also noted the misalignment with other existing relevant government policy prescripts (National Treasury Instruction No.3 of 2019/2020, 2019). This was further compounded when the Preferential Procurement Regulations, 2017 were promulgated and effected, resulting in conflict between the SIPDM and Regulations (FIDPM, 2019).

3.5.1 SIPDM Review: Critical Areas of Misalignment with Existing Relevant Policies

National Treasury together with various stakeholders conducted the SIPDM review which identified critical areas in which the system was mis-aligned to existing policies relevant to infrastructure procurement and delivery. This review resulted in the FIDPM (FIDPM, 2019). Some of the key findings of the review where:

- Recognition of the standard for uniformity in construction works contracts issued by the CIBD and supported by the National Treasury Regulations,

- Recognition of one institutional SCM system with differentiated procurement processes as opposed to two SCM systems,
- Role of independent reviewers in relation to the ultimate accountability of bid committees as prescribed by the National Treasury regulations,
- Alignment of the preferential point system (method 4) to the PPPFA and its related regulations.
- Alignment to the revised IDMS,
- Impact of responsibilities imposed to the national and provincial treasury cabinet,
- Impact of the prescribed professional registration to the readiness and capacity of institutions,
- Impact of the approval process of high value national and provincial major capital projects and its alignment to National Treasury prescripts, and
- Role of Treasuries in the gateway review process (National Treasury, 2019: 1).

3.5.2 Scope of the Framework (FIDPM)

The National Treasury FIDPM establishes governance for infrastructure delivery and infrastructure procurement within the ambit of Clause 217 of the Constitution of the Republic of SA, 1996, which:

- Focuses on governance decision making points including alignment and functions to support management of infrastructure delivery and procurement processes,
- Prescribes the minimum requirements for the implementation of the IDMS through the infrastructure delivery management processes which include portfolio, programme, projects, operations and maintenance of infrastructure, and the infrastructure procurement gates.
- Promotes value for money by organs of state throughout all phases of infrastructure delivery and management as well as encourage best use of resources to achieve intended outcomes.
- Clearly facilitates the allocation responsibilities for performing activities and decision making at control points, stages and procurement gates (FIDPM, 2019; National Treasury, 2019).

3.5.3 Framework for Infrastructure Delivery

The infrastructure delivery management (IDM) processes comprise of portfolio, programmes, operations, maintenance and projects depicted in Figure 3.3.

- *Portfolio, programme, operation and maintenance processes* – are typically cyclical and performed in phases and are reviewed and updated annually. These phases contain key control points (CP) at which the associated phase deliverable that needs to be approved. The phase may only continue beyond the CP once the phase deliverable has been approved by the person or body designated in the institutional policy arrangement to do so,
- *Project processes* – are typically linear, meaning a project process is performed in stages from start to completion. The project stages contain gates at the end of each stage at which the

associated stage deliverable needs to be approved. The project may only continue beyond the stage gate, in accordance with the approved contracting arrangements, once the stage delivery has been approved by the person or body designated in the institutional policy arrangements to do so (FIDPM, 2019)

This study focuses on the project processes section of the FIDPM referred to as the project management process in the IMDS training module (2019). In addition, the research seeks to investigate the FIDPM during the project management processes and identify the obstacles that hinders its implementation and the tools and techniques project managers may utilise towards successful public sector service delivery.

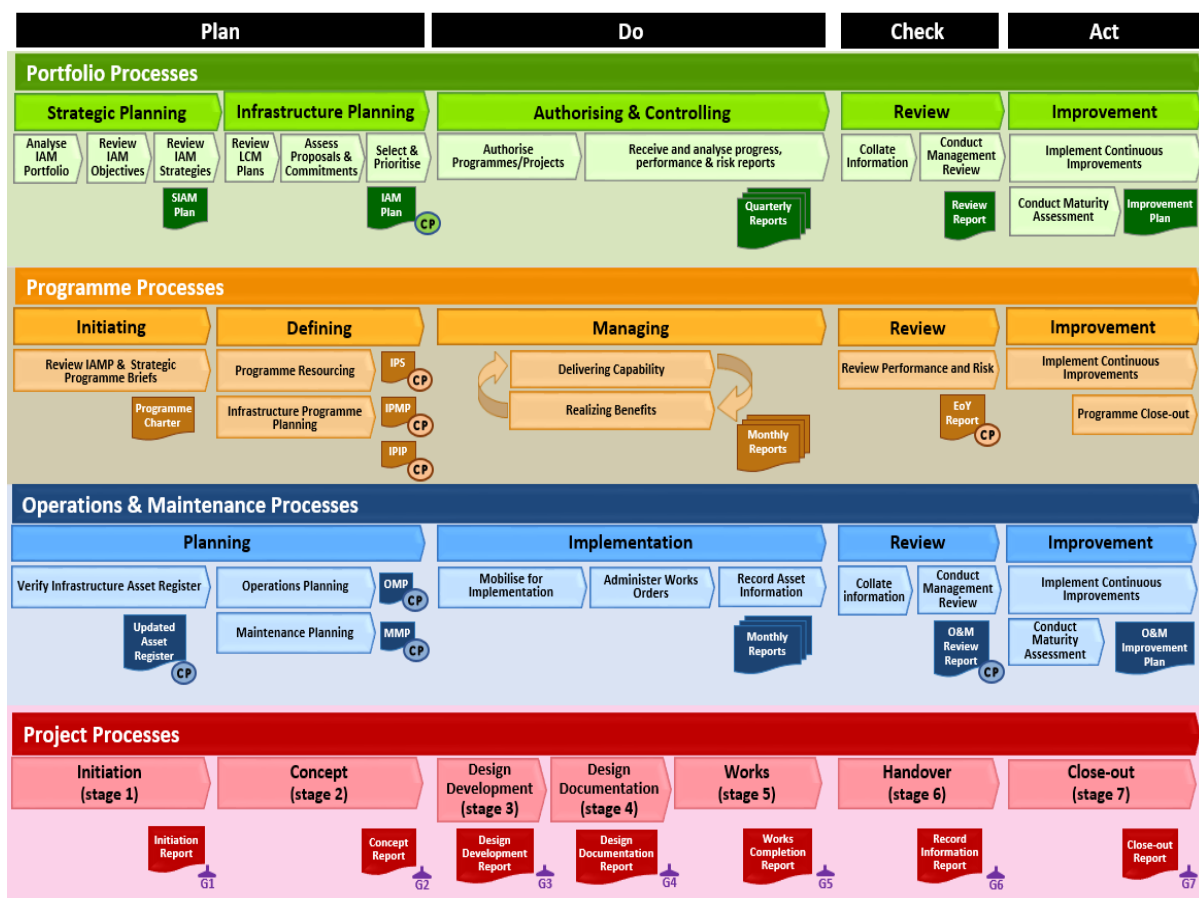


Figure 3.3: The Infrastructure Delivery Management Process Diagram (IDMS, 2019: 17)

3.5.4 The FIDPM Project Processes and Gateway Reviews

The infrastructure delivery project processes identified in Figure 3.2 are outlined in Table 3.3 which details the stage gate deliverables as minimum requirements to be developed, updated annually and approved by a delegated person or body in an institution.

Table 3.3: Project Processes Work Stage Deliverables (FIDPM, 2019: 12)

Stage No.	Stage Name	Stage Description	End of Stage Output
1	Initiation	<ul style="list-style-type: none"> The Initiation Report, which defines project objectives, needs, acceptance criteria, organisation's priorities and aspirations, procurement strategies, and which sets out the basis for the development of the Concept Report. A Prefeasibility Report is required on mega capital projects to determine whether or not to proceed to the Feasibility Stage, where sufficient information is presented to enable a final decision to be made regarding the implementation of the project. 	Initiation Report or Prefeasibility Report is approved, move to Stage 2.
2	Concept	<ul style="list-style-type: none"> The Concept Stage represents an opportunity for the development of different design concepts to satisfy the project requirements, as developed during Stage 1. It also presents, through the testing of alternative approaches, an opportunity to select a particular conceptual approach. The ultimate objective of this stage is to determine whether the project is viable to proceed, with respect to available budget, technical solutions, timeframe and other information that may be required. <p><i>(Gateway review to be expedited at end of this Stage if it is a major capital project)</i></p>	Concept Report or the Feasibility Report is approved, move to Stage 3.
3	Design Development	<ul style="list-style-type: none"> The Design Development Report shall as necessary: <ul style="list-style-type: none"> Develop in detail the approved concept to finalise the design and definition criteria. Establish the detailed form, character, function and costings. Define all components in terms of overall size, typical detail, performance and outline specification. Describe how infrastructure or elements or components thereof are to function, how they are to be safely constructed, how they are to be maintained and how they are to be commissioned. Confirm that the project scope can be completed within the budget or propose a revision to the budget. 	Design Development Report is approved, move to Stage 4.
4	Design Documentation	<ul style="list-style-type: none"> Design documentation provides the: <ul style="list-style-type: none"> Production information that details, performance definition, specification, sizing and positioning of all systems and components that would enable construction. Manufacture, fabrication, and construction information for specific components of the work informed by the production information. <p><i>(Infrastructure Procurement Requirements to be facilitated by SCM in terms of Procurement Gates 5 and 6 usually occur at this work stage, prior to commencement of Works, refer to Table 7)</i></p>	Design Documentation Report is approved, move to Stage 5.
5	Works	<ul style="list-style-type: none"> Completed Works capable of being used or occupied. The following is required for completion of the Works Stage: <ul style="list-style-type: none"> Completion of the works is certified in accordance with the provisions of the contract; or The goods and associated services are certified as being delivered in accordance with the provisions of the contract. 	Works Completion Report is approved, move to Stage 6.
6	Handover	<ul style="list-style-type: none"> Works which have been taken over by user or owner; completed training; Record Information. The following activities shall be undertaken during the handover stage: <ul style="list-style-type: none"> Finalise and assemble record information which accurately reflects the infrastructure that is acquired, rehabilitated, refurbished or maintained. Hand over the works and record information to the user organisation and if necessary, train end user staff in the operation of the works. 	Handover/Record Information Report is approved, move to Stage 7.
7	Close-out	<ul style="list-style-type: none"> The Close-Out Stage commences when the end user accepts liability for the works. It is complete when: <ul style="list-style-type: none"> Record information is archived. Defects certificates and certificates of final completion are issued in terms of the contract. Final amount due to the contractor is certified, in terms of the contract. d) Close-Out Report is prepared by the Implementer and approved by the Client Department. 	Defects Certificate or Certificate of Final Completion, Final Account and Close-Out Report is approved, the Project is Closed out.

It is noted that for major capital projects, gateway reviews are applicable. A major capital project is defined by the FIDPM (2019: v) as, “*an infrastructure project or a series of interrelated infrastructure projects on a single site with an estimated cost, including those required for new facilities or systems to become operational*”.

More specifically, the gate review occurs at the end of stage two and focuses on the quality of the documentation, the deliverability of the project, expected benefits including affordability and value for money. The review is conducted by a team appointed by the Accounting Officer who are experienced in infrastructure planning and registered with a professional statutory council listed in the built environment. The gate review team is responsible for issuing a report at the end of the gateway review indicating their assessment, findings and recommendations. Stage two will not be complete until all findings have been addressed (FIDPM, 2019).

Figure 3.4 presents the project processes in a systematic process flow which depicts four hold points. These hold points are identified at stages one to four as they are the key decision-making stages where projects could be delayed if not implemented efficiently and effectively by the delegated person or authority in the respective government department. Furthermore, this highlights the importance of ensuring delegated persons are authorised, capable and accountable for making the decision to move to the next project stage (provided the end of stage outputs are achieved) as most public sector projects will not proceed into construction until these four stages are complete.

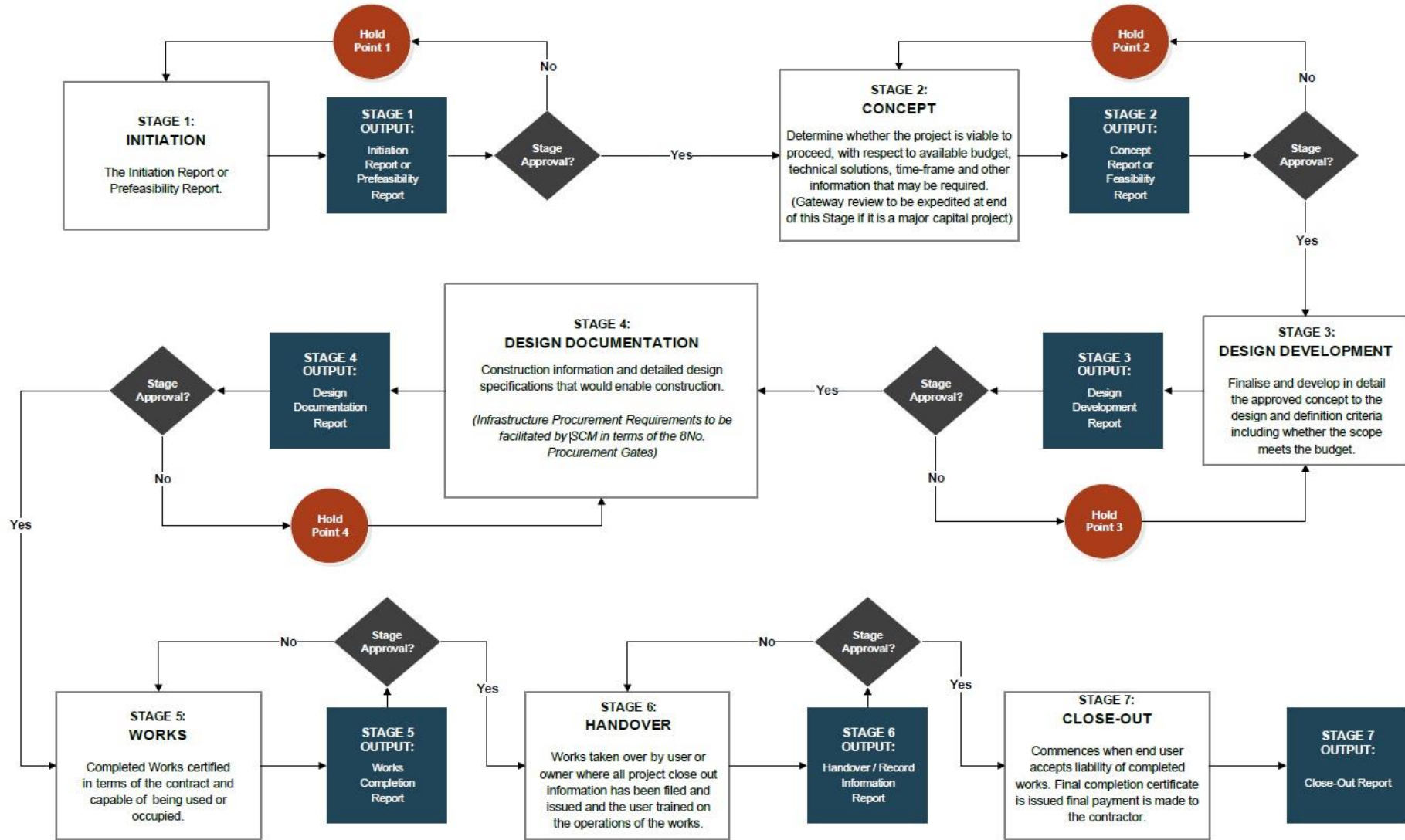


Figure 3.4: FIDPM Process Flow (adapted from the FIDPM, 2019:12)

Table 3.4 highlights the FIDPM Work Stages in relation to the previous SIPDM Review Gates and assists with providing a summary of where significant changes were made from the previous infrastructure delivery system.

Table 3.4: SIPDM Review Gates vs. FIDPM Work Stages

SIPDM Review Gates		FIDPM Work Stages	
Gate 0	Project Initiation.	Stage 1	Initiation
Gate 1	Infrastructure Planning.		
Gate 2	Strategic Resourcing.	Stage 2	Concept
Gate 3	Prefeasibility.	Stage 3	Design Development
	Preparation and Briefing.		
Gate 4	Feasibility.	Stage 4	Design Documentation
	Concept and Viability.		
Gate 5	Design Development.		
Gate 6	Design Documentation.	6A Production Information.	
		6B Manufacture, Fabrication and Construction Information.	
Gate 7	Works.	Stage 5	Works
Gate 8	Handover.	Stage 6	Handover
Gate 9	Package Completion.	Stage 7	Close-out

3.5.5 Framework for Infrastructure Procurement

It is critical to review the infrastructure procurement gates (PG) in relation to the new framework (FIDPM) as procurement through SCM in the public sector is a source for service delivery challenges (Ambe and Badenhorst-weiss, 2012). The FIDPM notes that infrastructure procurement is implemented in accordance with all applicable and related legislation including the FIDPM itself. In addition:

- Infrastructure procurement is implemented in accordance with the procurement gates presented in Table 3.5,
- Additional procurement gates can be introduced by the Accounting Officer to the prescribed gates,
- Furthermore, Professional Service Providers (PSPs) and Contractors can be procured at any point in the IDM processes,
- The Accounting Officer is responsible for ensuring budgets are available for contractual payments to contractors timeously in terms of their contracts,
- The procurement gates authorise commencement to the next control gate, provided all procurement gate requirements are met,

- The delegated person who is experienced, knowledgeable and skilled to achieve the intended results of the relevant procurement gate provides authorisation to proceed to the next procurement gate, and
- Effective and efficient emergency procurement procedures, approval delegation and safeguarding the institution including disposal policy and keeping electronic and manual format of records is the responsibility of the Accounting Officer (FIDPM, 2019).

Table 3.5: Infrastructure Procurement Gates (FIDPM, 2019: 22)

Procurement Gate No.	Minimum Requirement for Procurement Gate	End of Gate Output
PG 1	<ul style="list-style-type: none"> • Establish and clarify what needs to be procured. • Prepare broad scope of work for procurement. • Ascertain a title for the procurement for the purposes of project identification. • Estimate financial value of proposed procurement and contract for budgetary purposes, based on the broad scope of work. • Confirm the budget. 	PG 1 is complete when a designated person or body makes a decision to proceed/not to proceed with the procurement based on the broad scope of work and the financial estimates.
PG 2	<ul style="list-style-type: none"> • Decide on procurement strategies. • Establish opportunities for promoting preferential procurement in line with legislative provisions and the Construction Sector Code. • Establish contracting and pricing strategy comprising of an appropriate allocation of responsibilities and risks and the methodology by which contractors are to be paid. • Establish procurement procedures. 	PG 2 is complete when a delegated person or body approves procurement strategies that are to be adopted.
PG 3	<ul style="list-style-type: none"> • Obtain approval for procurement documents. Minimum requirements for PG 3: • Prepare procurement documents that are compatible with the approved procurement strategies. 	PG 3 is complete when a delegated person or body reviews the procurement document, identifies sections, if any, which require amendments or improvement, and grants the necessary approval.
PG 4	<ul style="list-style-type: none"> • Confirm that cash flow is sufficient to meet projected contractual obligations. Minimum requirement for PG 4: • Confirm sufficient cash flow to meet contractual obligations. • Establish control measures for payment of contractors within the time period provided for in the contract. 	PG 4 is complete when a delegated person or body ensures that cash flow is sufficient for the procurement to take place.
PG 5	<ul style="list-style-type: none"> • Solicit tender offers. Minimum requirements for PG 5: • Invite tender offers. • Receive tender offers. • Record tender offers. • Safeguard tender offers. • Prepare a report on tender offers received. 	PG 5 is complete when a delegated person or body ensures that all received tender offers are duly accounted for.
PG 6	<ul style="list-style-type: none"> • Evaluate tender offers in terms of undertakings and parameters established in procurement documents, 24 May 2019. Minimum Requirement for PG 6: • Open and record tender offers received. • Determine whether or not tender offers are complete. • Determine whether or not tender offers are responsive. • Evaluate tender submissions. • Perform a risk analysis. • Prepare a tender-evaluation report. 	PG 6 is complete when a person or body reviews evaluation report and ratifies recommendations.
PG 7	<ul style="list-style-type: none"> • Award the contract. Minimum Requirement for PG 7: • Notify successful tenderer and unsuccessful tenderers of outcome. • Compile contract document. • Formally accept tender offer. 	PG 7 is complete when a delegated person or body confirms that the tenderer has provided evidence of complying with all requirement stated in the tender data and formally accepts the tender offer in writing and issues the contractor with a signed copy of the contract
PG 8	<ul style="list-style-type: none"> • Administer the contract and confirm compliance with all contractual requirements. • Minimum Requirements for PG 8: • Capture contract award data. • Administer contract in accordance with the terms and provisions of the contract. • Ensure compliance with contractual requirements. 	PG 8 is complete when a delegated person captures contract completion/termination data.

3.5.6 Performance Measurement of the FIDPM in the Public Sector

Public sector analysts have highlighted that South Africa lacks a coherent model for public sector reform including public management (Chipkin and Lipietz, 2012; Muthien, 2013). The importance of the public sector's capability to successfully provide infrastructure service delivery to the public underpins the platform upon which society depends and yet in many cases the causes of infrastructure failure can be traced back to a lack of good governance, poor procurement and inadequate delivery management practices, all of which are under the control of the client (in this case, government departments). Successful infrastructure delivery does not rely solely on effective project management and the built environment professional. The role of government departments (client) is crucial in terms of setting the direction and providing effective governance (Watermeyer, 2018).

Since the implementation of the FIDPM on 01 October 2019, real time performance of its application is still developing. As a result, it is critical for government to ensure all necessary precautions have been taken (based on decades of consistent service delivery challenges) to ensure the FIDPM's successful implementation. This study seeks to investigate the barriers of the FIDPM's implementation over the duration of the research period (2019 to 2021) and identify the role that project managers can play through the utilisation and application of their tools and techniques towards improving government's initiatives towards successful public service delivery. This will allow a rich and valuable contribution to the academic body of knowledge as outcomes of performance are captured and reported on as they occurred during the early implementation of a new framework, during a global pandemic, covid-19.

3.6 Chapter Summary

This chapter reviewed and highlighted numerous key policies and frameworks implemented by the South African government to drive the delivery of services in the country post 1994. Service delivery legislature, policy and guidelines for service delivery were found to be in accordance with international best practice requirements. However, the chapter brought to light, the positive intent of policy makers has not matched the delivery of services to the public. In the country's third decade of democracy, service delivery challenges still plague the public sector and haunts its citizens. Through the years of unresolved service delivery challenges, government has sought to implement a new framework aimed at approaching infrastructure procurement and delivery management in a systematic and structured manner, the FIDPM. The framework highlighted project management as a key role player in the delivery of public services in all spheres of government in South Africa.

CHAPTER 4 – LITERATURE REVIEW: PROJECT MANAGEMENT IN THE BUILT ENVIRONMENT

4.1 Introduction

This chapter investigates the project management profession and its importance in the built environment and public sector. More specifically, it identifies the unique set of skills, tools and techniques project managers may use to assist the government with current policy initiatives towards improving public service delivery.

4.2 Background and Project Environment

Historically considered an art than science, through the increasing number of project management associations, institutions including academic establishments, project management is acknowledged as a science and discipline which has been formalised in certified programmes and the global body of knowledge (Burke, 2013). As an established discipline, project management executively involves the management of the complete development process from initiation to completion (CIOB, 2014). Rapid technological changes, competitive markets including changing business environments have resulted in companies changing management systems to project management to offer real solutions (Burke, 2019).

The successful completion of a project requires an appreciation of the context in which it is based. Projects and their management are greatly affected by their environment. Projects are executed in both internal and external project environments such as political, economic, technological, regulatory and organisational which impact the contexts and issues project management deals with in attaining the project objectives (PMBOK, 2021).

4.3 The Project Management Profession

The Project Management Institute (PMI) defines project management as, *“the application of knowledge, skills and techniques to execute projects effectively and efficiently. It is a strategic competency for organisations, enabling them to tie project results to business goals and thus, better compete in their markets”* (PMBOK, 2021: 4).

Project management is further defined by the Chartered Institute of Buildings (CIOB) Code of Practice for Project Management for Construction and Development as, *“the overall planning, coordination and control of a project from inception to completion aimed at meeting a client’s requirements in order to produce a functionally viable and sustainable project that be completed safely, on time, within authorised cost and to the required quality standards”* (CIOB, 2014:1).

PRINCE2 (2017:9) defined project management as, “*the planning, delegating, monitoring and control of all aspects of the project, and the motivation of those involved, to achieve the project objectives within the expected performance targets for time, cost, quality, scope, benefits and risk*”.

In South Africa, the Council for Project and Construction Management Profession (SACPCMP) defines Construction Project Management as, “*the management of projects within the built environment from conception to completion, including management of related professional services. The Construction Project Manager is one point of responsibility in this regard*” (SACPCMP, 2019:3).

In this study, project manager refers to construction project manager and project management refers to construction project management in terms of the definition outlined by the SACPCMP regarding the profession in the built environment with specific reference to its implementation and application in construction projects.

4.3.1 Project Management in South Africa

Project Management South Africa (PMSA) was established in 1997 as an independent, self-sufficient national association to represent project management professionals across all sectors in South Africa. The drive to create PMSA emanated from the need for a multi-sector forum for project professionals to meet and work together and for a national body to work with local organisations and the South African government in developing effective project management within South Africa. The association works closely with the PMI SA Chapter and has strong affiliations with many other associations. Locally, PMSA has co-operative agreements (legal instrument where funds are transferred from a partner/s to a recipient, where substantial involvement is expected between the recipient and partner/s when carrying out activities within the agreement) with Southern African Project Controls Institute (SAPCI), the SACPCMP, the Computer Society of SA (CSSA) and the CIOB (PMSA, 2020).

Post 1994 in South Africa led to important change in the country and the start of numerous internationally funded projects towards assisting in achieving democratic goals. The Minister of Public Works challenged PMSA in 1997 to assist government develop effective project personnel, practices and results. PMSA accepted the challenge and some of the results of the key government projects since 1997 include:

- A project management Standards Generating Body (SGB),
- Input and communication of the local project management standards and national qualifications,
- Contribution to the Construction Professions Act,
- Liaison and observer status on the Project Management Chamber in the Services SETA, and

- Establishment of an Education and Training Quality Assurance (ETQA) for project management under the Services SETA (PMSA, 2020).

The South African Council for the Project and Construction Management Professions (SACPCMP) governs the construction and project management professions in the country. The SACPCMP is a statutory body established by section 2 of the Project and Construction Management Act, 2000. The council is a newly enacted built environment council. In addition, the Council for the Built Environment (CBE) was established in terms of the Built Environment Act, 2000 (Act 43 of 2000) as the principal body of the six built environment councils, namely: Architecture, Landscape Architects, Engineering, Property Valuation, Project and Construction Management, and Quantity Surveying. The SACPCMP facilitates in statutory professional certification, registration and regulation of project and construction management professions to protect public interest and advance construction and project management education (SACPCMP, 2000).

4.3.2 Construction Consultants and the Project Manager in the Built Environment

The built environment hosts an array of role players that contribute to the construction of projects, these include:

- The owner/ client,
- Construction consultants – project manager/ principal agent, architect, quantity surveyor, engineers (civil, structural, geotechnical, land surveyor, electrical, mechanical, fire, wet services, environmental, health and safety and social facilitators,
- Main contractor, subcontractors including the construction labour force,
- Insurance companies and banks,
- Suppliers and
- The public (Civil Engineering Terms, 2020).

A consultant is hired in construction to advise and assess on building projects. Consultants are experienced specialists in construction including knowledge to some degree in engineering and related field and work for consulting firms, legal firms, government agencies including contractors. Construction consultant's assist clients prepare for their projects while ensuring contractors complete the project on cost. In addition, they provide cost estimates, develop budgets and select contractors and project end users (Weiss, 2009). A client or owner generally appoints a project manager, and consultants who report to the project manager. The project manager is the link and line of communication between the consultants and client (Gaskell, 2015).

Figure 4.1 illustrates a typical project organogram depicting the hierarchical structure of the team including the lines of reporting on a public sector construction project.

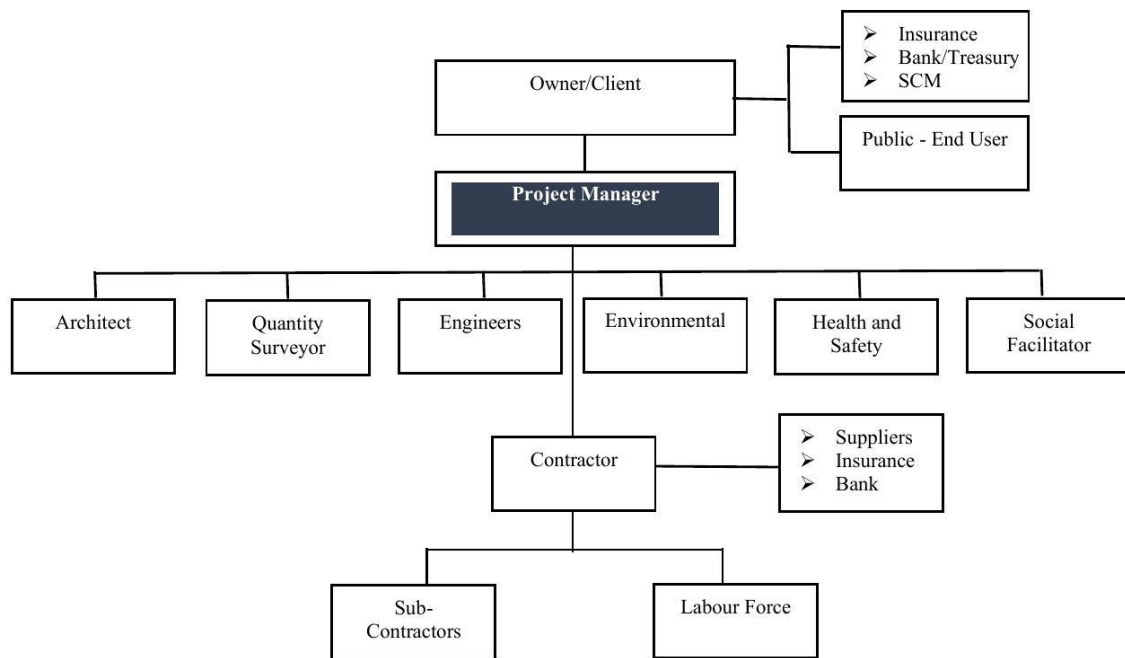


Figure 4.1: Typical Project Team Organogram (adapted from Holt, 1989: **PMBOK 2017**)

The role of the consultant team during construction entails administering the contract also referred to as the contract document. The contract document is an agreement between the client and consultant and further outlines professional services to be provided on the project. The impact of the services provided by the consultant team can be significant and are highlighted by Ip and Hanson (2012).

- Exceptional planners and experienced cost estimation skills supporting the client in establishing a feasible and viable budget,
- Explaining technical information in an understandable manner including teamwork skills to effectively work together with project stakeholders from inception to completion,
- Assist in the preparation of contractors including contractor selection,
- Administer construction contracts,
- Inspection completed works to ensure that quality standards have been met. The completion inspection is inclusive of the consultant team and project stakeholders. Once the consultant confirms the works complete, a final completion certificate and payment for the project is issued (Ip and Hanson, 2012).

Consultants play fundamental part in a construction project and are involved from the project's inception to its completion which is guided by a lead (Ip and Hanson, 2012). This position is usually suited for project managers, architects and engineers with extensive construction and management experience (Gaskell, 2015).

The next section presents the different project management process groups and work stages in which projects are executed.

4.3.3 Project Management Process Groups and Project Work Stages

A project management process group is a logical grouping of project management processes to achieve specific project objectives. Process groups are independent of project phases. Project management process are grouped into the following five process groups in Table 4.1:

Table 4.1: Five Project Management Process Groups (PMBOK, 2017:23)

No.	Project Process	Description
1	Initiating	Defines and authorises the project.
2	Planning	Defines and refines objectives. Plans actions required to attain the objectives and scope of the project.
3	Executing	Integrates resources to carry out the project management plan.
4	Monitoring and controlling	Ensuring the project objectives are met through regular monitoring to identify variances from planning and to enable corrective action were required.
5	Closing and evaluation	Formalising acceptance of the project and bringing it to an end.

The five process groups entail clear dependencies which are performed in the same sequence on each project. Furthermore, they are interdependent of application areas or industry focus. The process groups are linked by the objectives and the output of one process becomes an input to another process. The process groups are seldom either isolated or one-time events as they are overlapping activities which occur at varying levels throughout the project (PMBOK, 2017). Figure 4.2 illustrates how the process groups overlap during the project lifecycle:

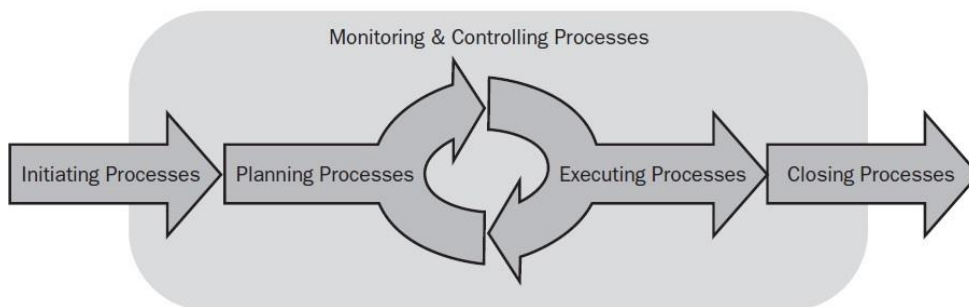


Figure 4.2: Overlapping Project Management Process Groups (PMBOK, 2008:19)

Projects go through different stages depending on scope and size which entail starting with a concept and ending in construction. The duration of each stage depends on the complexity of the project. Table 4.2 highlights project work stages recognised by the Construction Industry Council (CIC), Royal

Institute of British Architects (RIBA), Project Management Institute (PMI) and the South African Council for Project and Construction Management Profession (SACPCMP):

Table 4.2: Various Project Work Stages

Work Stage	Various Project Work Stages			
	RIBA	CIC	PMI	SACPCMP
0	Strategic Definition	-	-	-
1	Preparation and Brief	Preparation	Initiating	Inception
2	Concept Design	Concept	Planning	Concept and Viability
3	Developed Design	Design Development	Executing	Design Development
4	Technical Design	Product Information	Monitoring and controlling	Documentation and Procurement
5	Construction	Manufacture	Closing and Evaluation	Construction
6	Handover and Close Out	Post Completion	-	Close-Out
7	In Use	-	-	-
Source	RIBA, (2020)	CIC, (2020)	PMI, (2017)	SACPCMP (2000)

In the South African construction industry, project managers perform or execute their standard services over the life cycle of the project under six project work stages prescribed by the SACPCMP (SACPCMP, 2000). These are described in Table 4.3:

Table 4.3: SACPCMP Project Work Stages (SACPCMP, 2000)

Work Stage No.	Work Stage	Work Stage Description
1	Inception	Agreeing client requirements, assessing user needs, appointment of necessary consultants to establish the project brief, objectives, priorities, constraints, assumptions and strategies in consultation with the client.
2	Concept and Viability	Finalisation of the project concept including the project feasibility.
3	Design Development	Coordinate, manage and integrate the detail design development process within the project scope, time, cost and quality parameters.
4	Documentation and Procurement	Establishing and implementing procurement strategies and procedures, including the preparation of procurement documentation, for effective and timeous execution of the project.
5	Construction	The management and administration of the construction contracts and processes, the preparation and co-ordination of the documentation to facilitate execution of the works.
6	Close Out	Managing and administrating the project close out, including preparation and co-ordination of the documentation to facilitate operation of the project.

In contrast to the PMBOK project management process groups, the SACPCMP highlights the listed project work stages may or may not overlap. In addition, the standard project management services may be undertaken during any one of the project work stages and does not necessarily reflect the actual sequence of execution (SACPCMP, 2000).

Lastly, Table 4.4 illustrates the SACPCMP project work stages in relation to the previous SIPDM review gates and the current FIDPM work stages and assists with providing an understanding of how the PM profession as guided by the SACPCMP fits into the new infrastructure delivery system.

Table 4.4: SIPDM Review Gates vs FIDPM Work Stages vs SACPCMP Work Stages

SIPDM Review Gates		FIDPM Work Stages		SACPMP Project Work Stages		
Gate 0	Project Initiation.	Stage 1	Initiation	Stage 1	Inception	
Gate 1	Infrastructure Planning.					
Gate 2	Strategic Resourcing.	Stage 2	Concept	Stage 2	Concept and Viability	
Gate 3	Prefeasibility.	Stage 3	Design Development	Stage 3	Design Development	
	Preparation and Briefing.					
Gate 4	Feasibility.	Stage 4	Design Documentation	Stage 4	Documentation and Procurement	
	Concept and Viability.					
Gate 5	Design Development.					
Gate 6	Design Documentation.					6A Production Information.
						6B Manufacture, Fabrication and Construction Information.
Gate 7	Works.	Stage 5	Works	Stage 5	Construction	
Gate 8	Handover.	Stage 6	Handover			
Gate 9	Package Completion.	Stage 7	Close-out	Stage 6	Close Out	

4.3.4 The Project Managers Role in the Project Life Cycle

The PMBOK (2017) describes the project life cycle as the series of phases that a project passes through from start to completion. PMI (2017) further notes that the project life cycle entails the progression of a project from beginning to its completion. In addition, the Royal Institute of British Architects (RIBA, 2020), the project life cycle is divided into several stages including assigned project management practices and project managers with defined responsibilities. The following project life stages are defined: inception, feasibility studies, schematic design, detail design, production information, bills of quantities, tendering, project planning, construction and project completion (RIBA, 2020).

The project life cycle provides the basic framework for managing a project and applies regardless of the specific project work involved. The phases may be sequential, iterative, or overlapping and the project management team determines the best life cycle for each project. Furthermore, the project life cycle needs to be flexible to deal with multiple factors that the project entails (PMBOK, 2017). Figure 4.1 illustrated the project management process groups, together with Table 4.6 which highlights the FIDPM work stages, provides a suggestive awareness of the project life cycle on construction projects.

The CIOB (2014) describes project management as the overall planning, coordination and control of a project from inception to completion aimed at meeting a client’s requirements. This is supported by the SACPCMP (2000) which depicts the PM’s role and responsibilities over the six project work stages in Table 4.5 confirming the PM’s involvement is required throughout the project life cycle.

Table 4.5: PM Roles and Responsibilities under the Six Work Stages (SACPCMP, 2000:5)

Stage 1 - Brief	Stage 2 – Concept and Viability	Stage 3 – Design Development
Activities:		
<ul style="list-style-type: none"> • Development of a Clear Project Brief • Establish the client's Procurement Policy for the Project • Assist the client in the procurement of consultants including the definition of their roles, responsibilities and liabilities. • Establish with all relevant authorities the site characteristics necessary for the design and approval of the project • Manage the integration of the preliminary design to form the basis for the initial viability assessment of the project • Prepare, co-ordinate and monitor a Project Initiation Programme • Facilitate the preparation of the Preliminary Viability Assessment of the project • Facilitate client approval of all Stage 1 documentation 	<ul style="list-style-type: none"> • Procurement of the consultants including the definition of their roles, responsibilities and liabilities. • Advise the client on the requirement to appoint a Health and Safety Consultant • Communicate the project brief to and monitor the development of the Concept and Feasibility • Co-ordinate and integrate the income stream requirements of the client into the concept design and feasibility • Agree the procedures for cost control and reporting by the cost consultants on the project. • Manage and monitor the preparation of the project costing by other consultants • Prepare and co-ordinate an Indicative Project Documentation and Construction Programme • Manage and integrate the concept and feasibility documentation for presentation to the client for approval • Facilitate client approval of all Stage 2 documentation 	<ul style="list-style-type: none"> • Procurement of the remaining consultants including defining their roles, responsibilities and liabilities. • Establish and co-ordinate the formal and informal communication structure. • Prepare, co-ordinate and agree a detailed Design and Documentation Programme with all consultants. • Manage, co-ordinate and integrate the design by the consultants. • Conduct and record the appropriate planning, co-ordination and management meetings • Facilitate any input from the design consultants required by Construction Manager on constructability. • Facilitate any input from the design consultants. • Manage and monitor submission by the design team of all plans and documentation. • Establish responsibilities and monitor the information flow between the design team, including the cost consultants. • Monitor the preparation by the cost consultants of cost estimates, budgets, and cost reports • Monitor the cost to achieve budget compliance • Facilitate and monitor the design by the design team. • Facilitate client approval of all Stage 3 documentation
Deliverables		
<ul style="list-style-type: none"> • Project Brief • Project Procurement Policy • Signed Consultant/Client Agreements • Project Initiation Programme • Record of all meetings • Approval by Client to proceed to Stage 2 	<ul style="list-style-type: none"> • Signed Consultant/Client Agreements • Indicative Project Documentation and Construction Programme. • Approval by Client to proceed to Stage 3 	<ul style="list-style-type: none"> • Signed Consultant/Client Agreements • Detailed Design & Documentation Programme • Updated Indicative Construction Programme • Record of all meetings • Approval by Client to proceed to Stage 4

Stage 4 – Documentation and Procurement	Stage 5 – Construction	Stage 6 – Close - Out
Activities:		
<ul style="list-style-type: none"> • Select, recommend and agree the Procurement Strategy • Prepare and agree the Project Procurement Programme. • Co-ordinate and monitor the preparation of the tender • Facilitate and monitor the preparation by the Health and Safety Consultant of the Health and Safety Specification for the project • Manage the tender process in accordance with agreed procedures, including calling for tenders, adjudication of tenders, and recommendation of appropriate contractors for approval by the client. • Advise the client, on the appropriate insurances required for the implementation of the project. • Monitor the reconciliation by the cost consultants of the tender prices with the project budget • Agree procedures for monitoring and control by the cost consultants of the cost of the works. • Facilitate client approval of the tender recommendation(s). 	<ul style="list-style-type: none"> • Assist the client appoint contractors and finalise agreements. • Receive, co-ordinate, review and obtain approval of all contract documentation. • Monitor the ongoing projects insurance requirements. • Facilitate the handover of the site to the contractor. • Establish and co-ordinate the formal and informal communication structure and procedures. • Conduct and record site meetings • Monitor and approve the preparation of the Contract Programme by the contractor. • Monitor the preparation of the contractor's Health and Safety Plan. • Establish the construction information distribution procedures. • Agree and monitor the Construction Documentation Schedule. • Establish procedures for monitoring, controlling and agreeing all scope and cost variations. • Monitor, review, approve and certify monthly progress payments. • Monitor long lead items. • Prepare monthly project reports including submission to the client • Manage, co-ordinate and monitor all testing and commissioning. • Issue the practical completion lists and the certificate of practical completion. • Monitor the execution to achieve Works Completion. 	<ul style="list-style-type: none"> • Issue the Works Completion Certificate • Manage, co-ordinate and expedite the preparation of all as-built drawings and design documentation. • Manage and expedite the procurement of operating and maintenance manuals, warranties and guarantees. • Manage and expedite the procurement of all statutory compliance certificates and documentation. • Manage the finalization of the Health and Safety File for submission to the Client. • Co-ordinate, monitor and manage the rectification of defects. • Manage, co-ordinate and expedite the preparation and agreement of the final account by the cost consultants with the relevant contractors. • Co-ordinate, monitor and issue the Final Completion Defects list and Certificate of Final Completion. • Prepare and present Project Closeout Report.
Deliverables		
<ul style="list-style-type: none"> • Contractors, subcontractors and suppliers procurement strategy • Project procurement programme • Project Tender/ Contract Conditions • Record of all meetings • Approval by Client of tender recommendations 	<ul style="list-style-type: none"> • Signed Contractor(s) Agreements • Agreed Contract Programme • Adjudication and award of contractual claims • Construction Documentation Schedule • Monthly progress payment certificates • Monthly project progress reports • Record of all meetings • Certificates of Practical Completion 	<ul style="list-style-type: none"> • Works Completion Certificate • Certificate of Final Completion • Record of all meetings • Project closeout report

4.4 Project Management Tools and Techniques

There is no individual PM tool or technique that is full proof for the successful implementation of project management (PMBOK, 2017). Rather, various PM tools are combined with different techniques towards achieving desired strategic objectives and outcomes. As projects vary in size, nature and characteristics, the combinations of tools and techniques adopted by the PM are adaptable, usually based on the specific requirements and environment of the project. In addition, the PMBOK (2017) emphasises, for PM's to be successful in adaptive approaches, they need to familiar with the tools and

techniques to understanding how to effectively apply them. This study discusses the important PM tools and techniques that may be applied to construction projects in the built environment.

4.4.1 PM Attributes

Experience has proven that the identification and selection of the project manager is an important and influential appointment for the success or failure of the project. As the single point of responsibility, the PM integrates and co-ordinates all the contributions and guides them to successfully complete the project (Burke, 2019).

Various authors such as Bennis (1997), Burke (2019) and Kerzner (2019) including the CIOB (2014) and the PMBOK (2017) highlight attributes that experienced PMs should exhibit, these include:

- Select and develop an operational team from the project start,
- Leadership and management ability,
- Anticipate problems, solve problems and make decisions,
- Integrate project stakeholders,
- Operational flexibility,
- Plan, expedite and get things done,
- Negotiate and persuade,
- Implement traditional project management methodologies (such as, waterfall method, critical path or critical chain method).
- Ability to implement agile project management methodologies (such as, agile PM, Kanban, PERT (program evaluation and review technique), PRINCE2 (projects in controlled environments) and extreme PM)
- Understand the environment within which the project is being managed,
- Review, monitor and apply control,
- Administer the contract, the scope of work and scope changes,
- Manage in an environment of constant change, and
- The ability to keep the client happy (Bennis, 1997; Burke, 2019; CIOB, 2014; Kerzner, 2019; PMBOK, 2017).

4.4.2 Key Skillsets of Effective PMs

While technical project management skills are core to project management, Project Management Institute (PMI) research highlights that they are not enough in the increasingly complex and competitive global marketplace. As a result, organisations are pursuing added skills in leadership and business intelligence competencies which can support strategic objectives that contribute to the bottom line

(PMBOK, 2017). Project managers need to have a balance of three skill sets depicted in Table 4.6 to be most effective.

Table 4.6: Skill Sets of Effective Project Managers (adapted from the PMBOK, 2017:56)

No.	Project Management Skill Sets	Skill Set Description
1	Technical Project Management	<ul style="list-style-type: none"> ➤ The knowledge, skills and behaviours related to specific domains of project, program and portfolio management. The technical aspects of performing one's role. ➤ Focus on the critical technical project management elements for project managed, such as, critical success factors for the project, the schedule, selected financial reports and the issue log. ➤ Tailor both traditional and agile tools, techniques and methods for each project, ➤ Make time to plan thoroughly and prioritize diligently, ➤ Manage project elements, including but not limited to, schedule, cost, resources and risks (PMBOK, 2017).
2	Leadership	<ul style="list-style-type: none"> ➤ The knowledge, skills and behaviours needed to guide, motivate and direct a team, to help an organisation achieve its business goals, ➤ Demonstrating essential capabilities such as negotiation, resilience, communication, problem solving, critical thinking and interpersonal skills (PMBOK, 2017).
3	Strategic and Business Management	<ul style="list-style-type: none"> ➤ The knowledge of and expertise in the industry and organisation that enhanced performance and better delivers business outcomes, ➤ Explain to others the essential business aspects of a project, ➤ Work with the project sponsor, team and subject matter experts to develop an appropriate project delivery strategy, and ➤ Implement that strategy in a way that maximizes the business value of the project (PMBOK, 2021).

4.4.3 Effective Ways of Introducing Change

Project management is extensively regarded as the most effective way of introducing unique change (APM PMBOK, 2019; PMBOK, 2021). This is achieved by:

- Defining what needs to be accomplished, regarding time, cost and various technical and quality performance parameters,
- Develop and implement a plan to achieve these, ensuring consistent and sustained progress in line with these objectives,
- Using appropriate project management techniques and tools to plan, monitor and maintain progress, and
- Employing skilled project managers, namely who are responsible for introducing the required change and are accountable for its successful accomplishment (APM PMBOK, 2019; PMBOK, 2021).

4.4.4 Ten PM Areas of Expertise

The PMBOK (2017) identifies a knowledge area of project management by its knowledgeable requirements which is described according to its component processes, inputs, outputs, practices including tools and techniques.

A knowledge area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools and techniques. Although interrelated, the knowledge areas are defined separately from the project management perspective (PMBOK, 2017). The ten knowledge areas are commonly used on most projects and are highlighted in Table 4.7.

Table 4.7: Project Management Ten Knowledgeable Areas of Expertise (PMBOK, 2017:23)

No.	PM Knowledge Area of Expertise	Description
1	Project Integration Management	The processes and activities to identify, define, combine, unify and coordinate the various processes and project management activities with the project management process groups.
2	Project Scope Management	The processes to ensure that the project includes all the work required.
3	Project Schedule Management	The processes to manage the timely completion of the project.
4	Project Cost Management	The processes involved in planning, estimating, budgeting, financing, funding, managing and controlling costs.
5	Project Quality Management	The processes for incorporating the organisations quality policy regarding planning, managing and controlling project and product quality related requirements.
6	Project Resource Management	The processes to identify, acquire and manage the resources needed for the successful completion of the project.
7	Project Communications Management	The processes required to ensure timely and appropriate disposition of project information.
8	Project Risk Management	The processes of conducting risk management planning, identification, analysis\ on a project.
9	Project Procurement Management	The processes necessary to purchase or acquire products, services needed.
10	Project Stakeholder Management	The processes required to identify the people, groups, or organisations that could influence be impacted by the project and develop appropriate management strategies for effectively engaging stakeholders.

Project management is implemented throughout the project lifecycle and comprises the management of all involved towards achieving the project objectives safely and within agreed time, cost, quality and other performance criteria. In addition, project management provides a single point of integrative responsibility required to ensure that all variables on a project is managed effectively to ensure a successful project deliverable. Furthermore, projects are likely to be successful where an accountable person has been clearly identified for its satisfactory accomplishment (APM PMBOK, 2019). The PMBOK (2021) reinforces that adapting to the project environments unique objectives, stakeholders and complexity contributes to the project success.

4.5 The Benefits of Project Management

The PM plays a critical role in the leadership of a project team in order achieve the projects objectives which is visible throughout the project. In addition, a project manager may be involved in evaluation and analysis activities prior to project initiation and may include consulting with business leaders for improving organisational performance or advancing strategic objectives to meet customer needs.

Alternatively, a PM may be requested to assist in business analysis including business case development and aspects of portfolio management for the project. The PM's role may vary from organisation to organisation and can be tailored to fit the organisation in the same way the project management processes are tailored to fit the project (PMBOK, 2017).

The implementation of project management tools and techniques, enable key benefits highlighted by authors Burke (2019) and Kerzner (2019) including the PMBOK (2017) to be achievable, namely:

- Client - the PM is the single point of responsibility as clients prefer to deal with one accountable person.
- Single point of responsibility - with the PM responsible for the complete project, scope overlap and under lap is limited.
- Project integration – the PM coordinates and integrates all project participants.
- Response time - expedite response on project performance is important for effective project control.
- Procedures - planning and control system enables procedures and work instructions tailored to the specific needs of the project ()
- Considerable variety, no two days are alike,
- Significant freedom of choice,
- Opportunity to effect change across the organisation,
- Strong sense of accomplishment, and
- A steppingstone to promotion (Burke, 2019; Kerzner, 2019; PMBOK, 2017).

In addition, the PM is responsible for developing a plan through which the project is tracked and controlled to meet the predefined objectives. This is achieved through accurate and timely information supplied by the planning and control system outlining the scope of works and measures the performance against the original plan. A lack of information could be more expensive leading to poor management decisions, errors, rework and overruns. As a result, the benefits of using a PM approach stems from addressing the needs of the project (Burke, 2019).

4.6 The Importance of Project Management

Project management was once considered nice to have, and is now recognised as a necessity (Larson and Gray, 2011). As progress is made into the future, the perception of project management has changed. Organisations that were opponents of project management are now advocates. Management educators in the past, who preached that project management could not work, are now staunch supporters. Project management is here to stay (Kerzner, 2009). It is no longer a special need management, it is rapidly becoming a standard way of doing projects including construction projects (Larson and Gray, 2011).

It was noted that project management is the application of knowledge skills, tools and techniques to project activities to meet the project requirements. As a result, project management is accomplished through the appropriate application and integration of the project management processes identified for the project. In addition, project management enables organisations to execute projects effectively and efficiently (PMBOK, 2017). Table 4.8 exemplifies the implementation of effective project management in relation to poorly managed projects:

Table 4.8: Effective Project Management vs. Poorly Managed Projects (adapted from the PMBOK, 2017: 10)

Effective project management helps individuals, groups and public and private organisations to:	Poorly managed projects or the absence of project management may result in:
<ul style="list-style-type: none"> ➤ Meet business objectives, ➤ Satisfy stakeholder expectations, ➤ Be more predictable, ➤ Increase chances of success, ➤ Deliver the right product at the right time, ➤ Resolve problems and issues, ➤ Respond to risks in a timely manner, ➤ Optimise the use of organisational resources, ➤ Identify, recover or terminate failing projects, ➤ Manage constraints such as scope, quality, schedule, costs and resources, ➤ Balance the influence of constraints on the project, and ➤ Manage change in a better manner (PMBOK, 2017). 	<ul style="list-style-type: none"> ➤ Missed deadlines, ➤ Cost overruns, ➤ Poor quality, ➤ Rework, ➤ Uncontrolled expansion of the project, ➤ Loss of reputation for the organisation, ➤ Unsatisfied stakeholders, and ➤ Failure in achieving the objectives for which the project was undertaken (PMBOK, 2017).

Projects are an important way to create value and benefits in organisations. In the current business environment, organisation leaders need to be able to manage with tighter budgets, shorter timelines, scarcity of resources and rapidly changing technology. It is key to note that the business environment is dynamic with an accelerating rate of change. To remain competitive in the world economy, companies are embracing project management to consistently deliver business value (PMBOK, 2017). Effective and efficient project management should be considered a strategic competency within organisations that enable them to tie project results to business goals. Compete more effectively in their markets. Sustain the organisation and respond to the impact of business environment changes on projects by appropriately adjusting project management plans (PMBOK, 2017).

This highlights the importance of the PM and the imperative role they play in the successful delivery of the project, reinforcing that the application of project management tools and techniques by the PM is key for assisting in the implementation of governments FIDPM towards the successful delivery of public sector projects.

4.7 Project Management and its Role Towards Addressing Service Delivery Challenges

The significance of project management is regarded as a cornerstone for any institutions responsible for rendering services to the public or customers. A project is a vehicle for service delivery and project management is a strategic tool available at any organisations disposal to enhance productivity or service delivery (Knipe, Van der Walt, Van Niekerk, Burger and Nell, 2016). In addition, the FIDPM recognises that project management plays a critical role in the delivery of public services in South Africa as all spheres of government structures implement and deliver services through policy, portfolio, programmes and projects (FIDPM, 2019).

Using project management processes, tools and techniques puts a sound foundation in place for organisations to achieve their goals and objectives (PMBOK, 2017). A project may be managed in three separate scenarios, a stand-alone project (outside of a portfolio or programme), within a programme, or within a portfolio. When a project is within a programme or portfolio, project managers interact with portfolio and programme managers. A programme is as a group of related projects, secondary programmes and programme activities managed and coordinated to obtain benefits not available from managing them individually. A portfolio entails projects, programmes and secondary portfolios and operations managed as a group to achieve strategic objectives (FIDPM, 2019).

On public sector projects, a programme consisting of multiple projects may be implemented through a particular portfolio. The programme will entail a project manager who manages the programme, and reports to the programme manager and portfolio manager. As a result, programme management and portfolio management differ from project management in their life cycles, activities, objectives, focus and benefits. However, all three roles may be fulfilled by an experienced project manager (FIDPM, 2019, IDMS, 2019).

Value Creation for Public Service Delivery through Project Management

There is a significantly strong relationship between project success and the leadership competencies of the project managers. Leadership being amongst the most studies in human behavioral aspect identified competency of the project manager. The competency of the project manager needs to be complimented by contingency skills, trait, behavior, vision in leadership and emotional intelligence as five major schools of thought (Geoghegan and Dulewicz, 2008).

The evolution of project management over the years has been influenced by the level of project failures, which have also prompted various institutes to develop certain sets of standards for managing projects. These standards have also reflected the level of awareness and attention paid to project management, signified by heightened level of growth in acceptance of formalised project management tools and techniques (Papke-Shields and Boyer-Wright, 2017).

Papke-Shields *et al.* (2017) stated that there is empirical evidence supporting a positive relationship in project management practices and project success, implying that project management practices or standards inherently increase prospects of project success. Ika (2009) also iterated that the use of project management tools and techniques remain imperative in today's environment.

Government efforts in implementing service delivery have been highlighted as poor, due to challenges still present (Khumalo *et al.* 2017; Olaregaju and Ibrahim, 2020). Generally, the hierarchical and bureaucratic arrangements in government do not support projects as they require adaptability, delegated authority, responsibility and decentralised decision-making powers (Artto, 2001; Van der Waladt, 2007). As government continuously emphasise project applications for the implementation of public frameworks and policies (such as the FIDPM) including service delivery objectives, mechanisms should be developed that enable government interface with temporary project organisations to enhance government projects (Renz, 2007; Turner and Keegan, 2001).

While the public sector is viewed by authors Moore (1992) and Petters (1996) as less innovative than the private sector, project management plays an important role towards innovative delivery approaches in public service (Pollitt and Bouckaert, 2000). The key main driver behind the application of project management in government is to improve state institution's ability to deliver efficient, effective and high-quality services (Srivannaboon and Milosevic, 2006). Project management can support the achievement of institutional goals and provide confidence and assurance to stake holders that resources are effectively managed as project managers vest responsibility, authority and accountability (Hobs, 1993; Larson, 2004; Thiry and Matthey, 2005).

Key institutional goals that project management can assist towards improving service delivery include:

- To be more responsive and relevant to the needs of citizens,
- To be more efficient and effective in the use of public resources,
- To be more representative of the diversity and needs of all, especially the most disadvantaged sectors of society,
- To improve access to services, make them more responsive to the needs of citizens,
- To be more flexible and more efficient in the use of allocated funding,
- To remove the command/ control approach of management and accompanying excess regulation,
- To have the ability to adjust policies and processes when societal problems are detected,
- To better utilise technology in the delivery of services, and
- To remove public/ private sector competition and promote partnerships (Srivannaboon and Milosevic, 2006).

Applying a formalised project management framework or methodology to projects can help with clarification of, and agreement to, goals, identifying resources needed, ensuring accountability for results and performance and fostering a focus on final benefits to be achieved (Van der Walddt, 2007).

Project management should therefore be the focal point for policy makers in that they should think through the end-to-end process to translate a particular policy into delivery plans and delivery plans into desired outcomes. This end-to-end policy making is important to consider implementation and delivery from the start. By incorporating the issues and perspectives from operational systems and structures, policy implementation is simplified. The involvement of project managers throughout the process can strengthen the deliverability of the outcomes and commitment to the policy objectives (Cleland and Ireland, 2002). Emphasising that projects managers are in a key position to aid government with the implementation of the FIDPM.

In addition, further value of good project management is that there are standardised processes in place to deal with all contingencies. Using sound project management techniques and processes will give a higher likelihood that service delivery projects will be completed on time, within budget and to an acceptable level of quality. It also provides a framework, process, guidelines and techniques to greatly increase project success (Cleland and Ireland, 2002). Key project management value areas of importance in the delivery of public services are highlighted in Table 4.9:

Table 4.9: Key Project Management Value Areas in Service Delivery

No.	PM Value Areas	Description
1	Risk Management	Employer generated risks have a substantial impact on the outcome of construction project, and the risks can be identified and managed. Sound risk management processes will result in potential problems being identified and managed before the problems actually occur (Rwelamila and Jerling, 2011).
2	Knowledge Management	High levels of service inputs in the construction industry characterised by professional knowledge or expertise relative to a specific technical or functional domain may qualify the industry as a knowledge intensive industry. As a result, design, architecture, surveying and other construction services such as project management are knowledge intensive service factors (Egbu and Robinson, 2005).
3	Skills Development	Important to the construction process are highly skilled project participants, which include, clients, consultants, suppliers and contractors. Traditional construction requires basic knowledge and skilled individuals. However, innovative infrastructural projects that are ill-defined and complex to implement, require problem solving individuals with tacit knowledge (Egbu and Robinson, 2005). Lawless (2007) highlighted that apart from service delivery challenges, the shortage of skills in South Africa has resulted in the loss of institutional knowledge, uncoordinated housing developments and endangers the performance of projects.
4	Organisational Culture and Continuous Improvement	Innovative potential that is created by procurement strategy can only be used if the organisational culture of built environment professionals, clients, suppliers and contractors are open to performance improvement (Girmscheid and Hartmann, 2002). In order for the industry to improve its performance, it needs to change prevailing culture, and by implication, supply chain member firms need to change their culture towards one that supports continuous improvement. The evolution of organisational culture will support the construction sector in

		embracing new processes towards improving quality and productivity (Sommerville and Craig, 2006).
5	Quality Services	In line with Batho Pele principles and process associated with comprehensive performance management systems of department, effective project management includes quality management processes which will assist the department understand the customers quality specifications and to establish quality control and quality assurance techniques (Van der Waldt, 2007).
6	Relationships and Networking	Problems in a project can be avoided with effective communication. Using a systematic process result in better project planning which gives the team an opportunity to make sure they are in agreement on the major deliverables produced by the project (Van der Waldt, 2007).
7	Financial Management	Better cost estimation, formal budgeting and better tracking of actual costs results in better financial predictability and control (Van der Waldt, 2007).
8	Resource Utilisation	Better project management processes will result in departments being able to manage the scope of a project more effectively, which will result in cost and other resource savings (Van der Waldt, 2007).

Emuze and Smallwood (2013) indicated that there is major scope for the advancement of management concepts in the South African infrastructure sector and it deserves further exploration. As a result, this study identifies the project management tools and techniques that can be utilised towards PMs assisting in the successful implementation of the FIDPM for enhancing governments initiatives for public service delivery.

4.8 Chapter Summary

This chapter presented the project management profession, its role and application in the built environment. The unique knowledge areas, processes including tools and techniques that PMs utilise to manage projects towards successful completion were reviewed in detail. Thereafter, the skillsets, attributes and benefits of project management were highlighted. The chapter then revealed the important role project management plays in service delivery approaches in the public sector, and that it is a fundamental driver towards improving public sectors ability to deliver effective and efficient quality services. Project management has been seen as a focal point for policy makers emphasising PMs are in an important position to assist government with the implementation of the FIDPM.

CHAPTER 5 – CONCEPTUAL MODEL FOR IMPROVED SERVICE DELIVERY IN THE PUBLIC SECTOR

5.1 Introduction

Towards ensuing improved service delivery in the public sector, a well-constructed conceptual model for Improved Implementation of the FIDPM through the utilisation of PM Tools and Techniques Towards the Successful Delivery of Public Services including hypothesized relationships are outlined in this chapter.

5.2 A Conceptual Model in Research

A conceptual model is a framework that is initially used in research to outline the possible courses of action or to present an idea or thought. The framework makes it easier for the researcher to easily specify and define the concepts within the problem of the study. When a conceptual model is developed in a logical manner, it will provide rigor to the research process (Luse, Mennecke and Townsend, 2012).

According to Jonker and Pennink (2010) in the family of scientific models which are derived from a positivistic tradition, hypothetical casual relations are depicted and operationalised then tested and verified. In addition, models can be presented in graphical or narrative form showing the key variables or constructs to be studied and the presumed relationships between them (Fellows and Liu, 2015).

The demonstrations of relations between the variables in a conceptual model is an important part of the theory implemented to achieve these relations as conceptual models are primarily based on theoretical notions. As a result, when data is collected and analysed, it is done on the premise of underlying theories which are translated into models and concepts (Jonker and Pennink, 2010; Cooper and Schindler, 2008; Foley, 2005).

The role of a conceptual model in quantitative research is to allow the researcher to relate the conceptual model to the existing body of literature using scientific concepts to provide a specific order including coherence that was not evident prior to conceptualisation (Oliver, 2002). In addition, the line of reasoning for the linkages between theory from the literature and the conceptual model should be supported by adequate referencing. This allows the research to be connected with research results and theories of others and enables justification on a theoretical level making this a key function of the conceptual model (Fellows and Liu, 2015).

The construction of the model also assists in structuring the problem, bringing to light the relevant factors and thereafter providing the connections exemplifying the problem. The conceptual model will

be an accurate representation of the research being studied if done correctly (Jonker and Pennink, 2010). The final function of the conceptual model entails linking it to systems theory which involves two components, elements and relationships among elements (Fellows and Liu, 2015). The intent is to create a conception or model of what is being planned for study, including what is going on between elements and why. The primary function is to inform the rest of the research design, refine study goals, develop relevant research questions, select appropriate research methods and identify any potential validity threats to the conclusions of the research (Robson, 2011).

Authors Akintoye (2015), Grant and Osanloo (2014) and Passey (2020) emphasise that a conceptual model is usually adopted for a study because:

- It assists the researcher in identifying and constructing their world view on the phenomenon to be investigated. Service delivery challenges have been a long standing problem (more than two decades) in the South African public sector. With government introducing a new framework to address and enhance service delivery, the research seeks to investigate the implementation of the FIDPM.
- It is the simplest way through which a researcher presents their asserted remedies to the problem they have defined. The FIDPM recognises that PM plays a critical role in assisting government achieve service delivery goals. The study further investigates whether PMs can utilise their unique tools and techniques to assist in the successful implementation of the FIDPM and improve public service delivery.
- It accentuates the reasons why a research topic is worth studying, the assumptions of a researcher, the scholars they agree and disagree with and how they conceptually ground their approach. Poor public service delivery and its related challenges has hampered the lives of citizens in South Africa for decades since the post-apartheid government. Despite numerous service delivery policies, service delivery challenges remain a problem. The FIDPM has been implemented to address and enhance service delivery. In addition, the FIDPM recognises PM is a key role player towards achieving service delivery goals.
- Finally, the conceptual model is most likely used by researchers when existing theories are not applicable or sufficient in creating a firm structure for the study. There is currently limited research on the performance measures of the FIDPM in real time application. Therefore, the conceptual model was developed to assist in adding to the existing body of knowledge based on the recorded outcomes of the study.

5.3 The Modelling Approach Adopted in this Study

A path model depicts the casual relations between characteristics of interest (variables). Typically, path models are read from left to right, with the variables on the left (independent variables) predicting the outcome variable on the right (dependant variable). Path models are used to describe quantitative

analyses such as regressions or more complex structural equation models. In both cases, the beta or standardised coefficient is typically presented (Fellows and Liu, 2015).

In this study, path modelling entailed the development of a conceptual framework illustrated through a path diagram. In the path diagrams the observed variables are presented in squares or rectangles while latent (unobserved) variables are depicted in circles or ellipses. Furthermore, each line with a single arrowhead exemplifies a hypothesised relationship or a direct effect of one variable on the other while, two-way arrows with arrowheads at each end present covariation between two variables (Hair *et al.* 2018; Kline, 2016; Schumacker and Lomax, 2016; Tabachnick and Fidell, 2019)

The conceptual model proposed in Figure 5.1 includes the dependant variable, improved service delivery and three drivers or leading variables, these are:

1. Public sector,
2. Government Policies, Frameworks and the FIDPM, and
3. PM tools and techniques.

The 19 unobserved variables were:

1. Recurring Problems in the Public Sector
2. Public Service Transformation Strategies
3. Government Initiatives
4. Batho Pele Principles
5. Service Delivery Challenges
6. Government Processes and Decision Making
7. Management Strategies for Service Delivery
8. Policy Development and Implementation
9. Effective Policy Implementation
10. SCM Public Procurement Challenges
11. IDMS, SIPDM & FIDPM
12. Government Ability to Apply the FIDPM
13. PM Attributes
14. Effective Ways of Introducing Change
15. Skill Sets of Effective PM's
16. Ten Areas of Expertise and Service Delivery Challenges
17. Key Institutional Goals
18. Application of IDM Toolkits Principals and Benefits by PM's
19. Implementation of IDM Toolkits Principals and Benefits in FIDPM Work Stages

Figure 5.1 presents the proposed improved service delivery conceptual model which illustrates the relationships to be tested between the observed and unobserved variables.

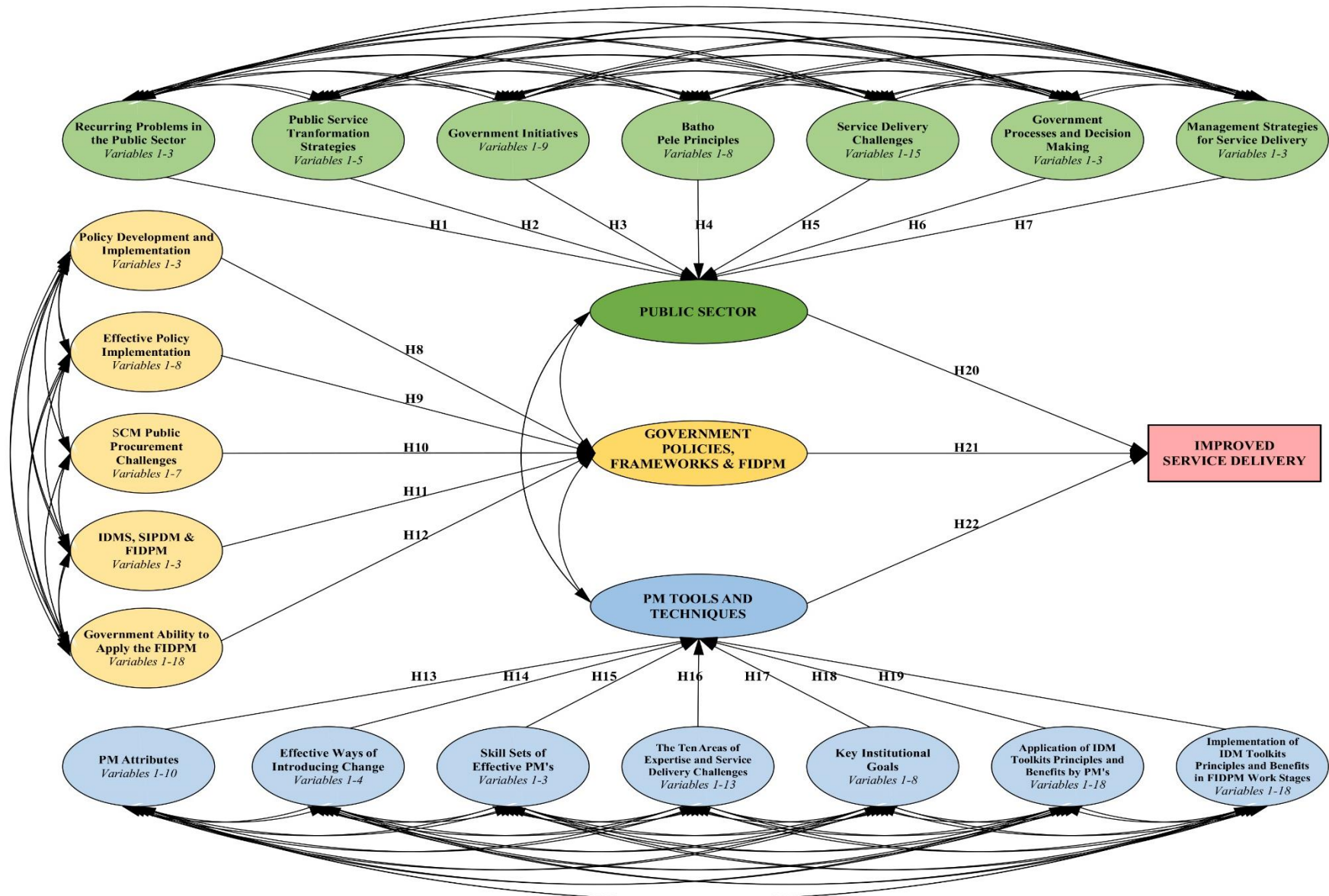


Figure 5.1: The Proposed Improved Service Delivery Conceptual Model

Figure 5.2 exemplifies the public sector driver in detail highlighting the proposed relationship between the observed variable, the unobserved variable and the 46 variables (indicators).



Figure 5.2: Detailed Path Diagram for the Public Sector Driver

Figure 5.3 illustrates the government policies, frameworks and the FIDPM driver in detail highlighting the proposed relationship between the observed variable, the unobserved variable and the 39 variables (indicators).

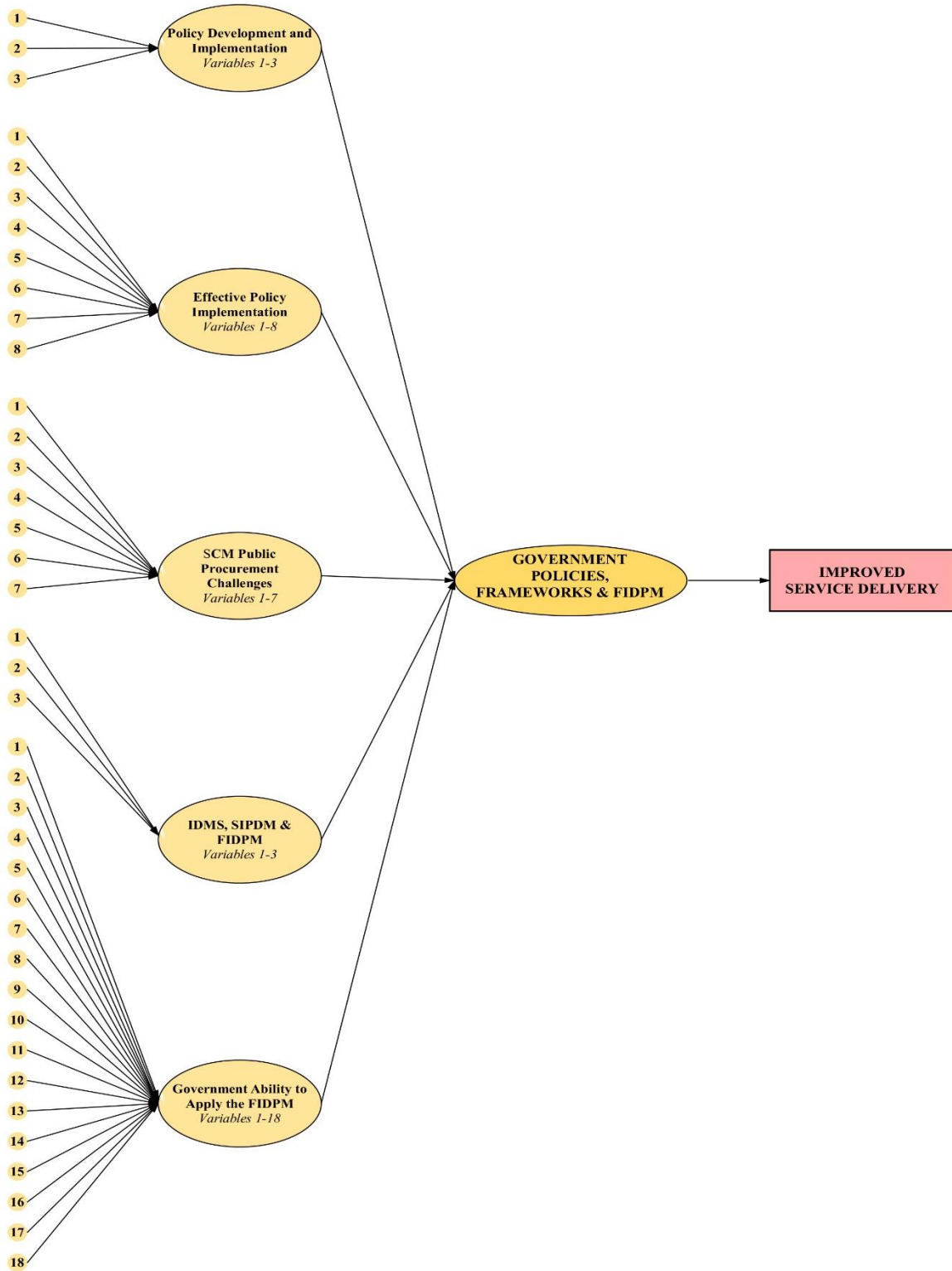


Figure 5.3: Detailed Path Diagram for the Government Policies, Frameworks and the FIDPM Driver

Figure 5.4 depicts the PM tools and techniques driver in detail highlighting the proposed relationship between the observed variable, the unobserved variables and the 75 variables (indicators).

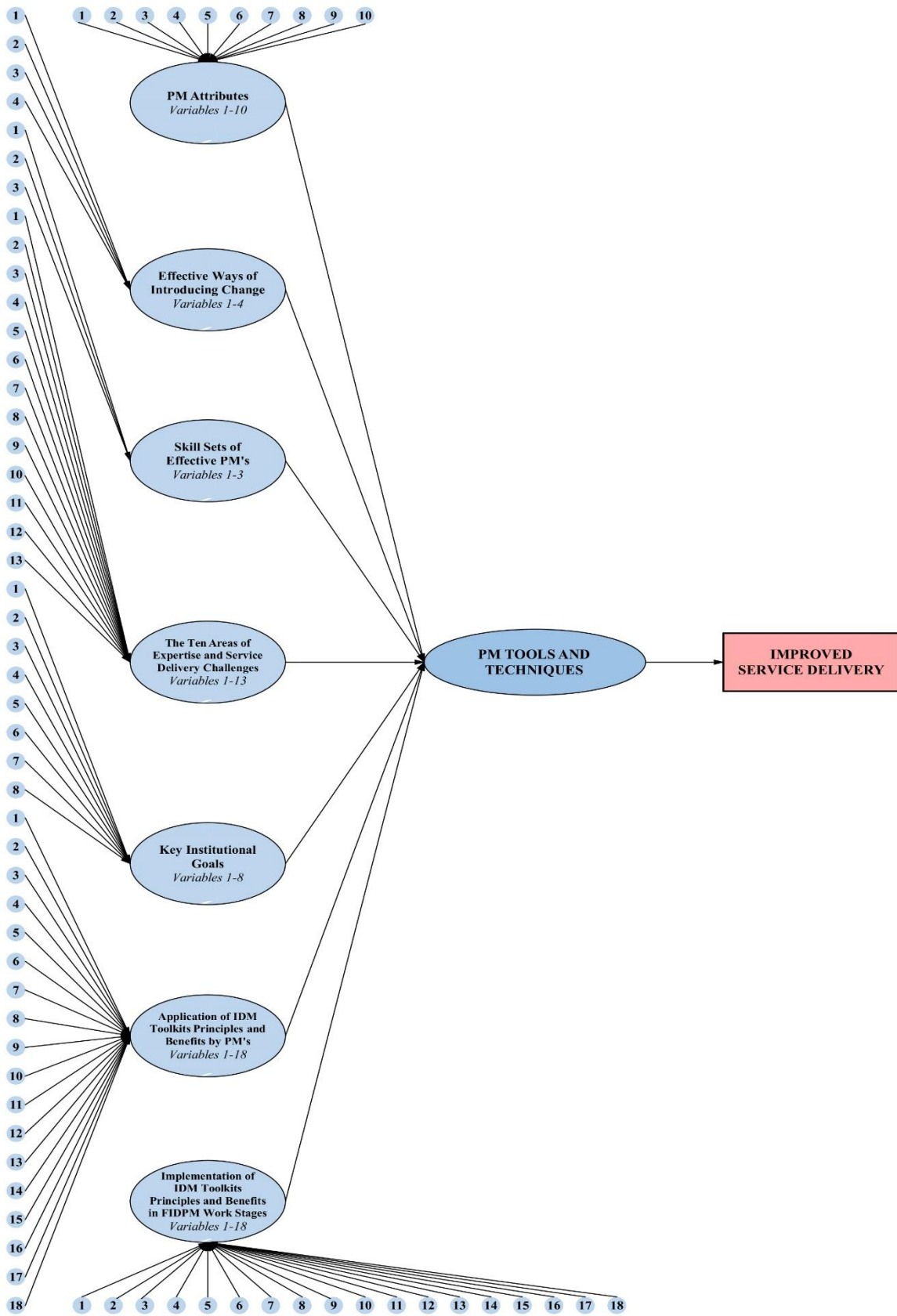


Figure 5.4: Detailed Path Diagram for the PM Tools and Techniques Driver

5.4 The Selection of the Dependant Variable

The challenges experienced with poor public service delivery has been extensively discussed in chapters 2 and 3. As a result, the advantages and reasons for the selection of the dependant variable and drivers are discussed here.

- *The dependent variable* – is the variable that depends on other factors that are measured as these variables are expected to change as a result of an experimental manipulation of the independent variable or variables as it is the presumed effect.
- *The independent variable* – is the variable that is stable and unaffected by the other variables you are trying to measure. It refers to the condition of an experiment that is systematically manipulated by the investigator. It is the presumed cause. Therefore, the dependant variable is the variable being tested in a scientific experiment. It is dependent on the independent variables (Fellows and Liu, 2015; Tabachnick and Fidell, 2013).

Improving Service Delivery

The dependent variable in this study was identified as improved service delivery. This was selected due to the due to the decades of challenges plaguing the public sectors progress towards improved serviced service. The recent framework, the FIDPM has been implemented as an initiative by government to improve infrastructure service delivery in construction and recognises project management a key role player to achieve this objective. As a result, the PM tools and techniques are investigated, that can assist the implementation of the FIDPM on public sector projects towards improving service delivery.

The Constitution of the Republic of South Africa (1996), the White Paper of the Transformation of the Public Service (Department of Public Service and Administration, 1997), Project Batho Pele and the Code of Conduct for Public Servants (Public Service Commission, Republic of South Africa, 1996) provides values, vision and mission statements including institutional and personal guidelines aimed at quality and professional service delivery. However, service delivery challenges are still present in South Africa and underpinned by three primary areas of influence: political issues, policy issues and implementation issues (National Conference on Public Service Delivery, 1997). Various other aspects impeding service delivery include incompetent public servants, lack of accountability, poor human resource practices, inadequate procurement practices and lack of leadership (Janse van Rensburg, 2014). Critical problems areas that immediate intervention include service delivery difficulties, poor management of finances, high level of unemployment, nepotism and corruption (Akinboade, Kinpack and Mokwena, 2012). Countries around the world including South Africa are striving to improve public service delivery. However, there is no blueprint of solutions available. Improving public services requires making policy makers, public servants and service providers accountable to citizens and

promoting citizen engagement and trust in public institutions (World Bank report, 2015; World Economic Forum, 2016).

All too often the gap between what was planned for and what was achieved in an infrastructure project is significantly different. There is a direct linkage between the role played by the client (public sector) and the outcomes of an infrastructure project (service delivery), regardless of its size, complexity and location. The root causes of infrastructure failure can be frequently attributed to the lack of governance and poor procurement and delivery management practices, all of which are under the control of the public sector (Watermeyer, 2018; Fitzgerald and Hodgson, 2017). Although many infrastructure projects are similar in nature, each project is unique (Phillips, 2018). This is due to several important project variables including what is delivered, the public sectors proposition for projects, stakeholder influences, resources employed, constraints, processes and procurement practices are employed in delivering the required infrastructure (Laryea and Watermeyer, 2018). Infrastructure projects through service delivery need to be set up and delivered (McKinsey and Company, 2017). Once decisions are made on what the project needs to deliver, who will deliver it and how it will be funded and governed, the remaining decisions centre on how it will be managed through to completion (Watermeyer, 2018).

As a result, the South African government has developed the FIDPM towards improving service delivery in the public sector (FIDPM, 2019). However, the manner in which it is applied is critical to its successful implementation. For the conceptual model, the key functions of the public sector, the implementation of the FIDPM and the PM profession with its tools and techniques are very important in the actualisation of attaining improved service delivery. The dependant (observed) variable, the unobserved variables, and the variables (indicators) are exemplified in Tables 5.1 – 5.3.

Table 5.1: The Identified Dependent (Observed) Variable, Unobserved Variables and Indicators – The Public Sector

Leading Variable/ Driver	Unobserved Variable	Breakdown of Indicators	Source	
<p><i>Public Sector</i></p> <ul style="list-style-type: none"> ➤ The public sector is the key driver for the implementation of service delivery in South Africa and is mandated to ensure the general welfare of all South Africans by delivering public goods and services while playing a critical role on the economy (Chipkin and Lipietz, 2012; Linna <i>et al.</i> 2010). ➤ In addition, a well-functioning public sector needs to be effective and efficient in fulfilling its responsibilities to all stakeholders. The public sector needs to provide public goods and services in a manner that responds adequately to the needs of its stakeholders in an ever-changing environment (Gabel-Shemueli and Capell, 2013). ➤ The roots of the public sectors success or failures lies in the economic policies and decisions around appropriate economic mix on how best the public sector is able to produce optimal output (Schiller, 1993). ➤ It is therefore key to note that the intervention of the public sector should be to address failures which include but is not limited to services and infrastructure delivery (Financial and Fiscal Commission Report, 2017). 	1	Recurring Problems in the Public Sector	<ol style="list-style-type: none"> 1. Consistent recurrence of findings. 2. Resource optimisation, accountability and a non-compliance culture seem to be the main problem areas in the public sector. 3. The root causes of problems are not being adequately addressed. 	(Fourie, 2014; Fourie and Poggenpoel 2016; Jarrar and Schimua, 2007; Khumalo <i>et al.</i> 2017; Modell, 2005; Montiel, 2011; Muthien, 2013; Schiller, 1993)
	2	Public Service Transformation Strategies	<ol style="list-style-type: none"> 1. Generate mission statements for service delivery linked to service guarantees. 2. Identify services and target populations for services with emphases on affordability and redress. 3. Set definite service standards, define outputs and targets and determine performance indicators benchmarked against international standards. 4. Manage service delivery by means of sound human and financial resource management in partnerships with the private sector, nongovernmental organisations and the community. 5. Develop a culture of customer care and context and client sensitive service delivery. 	(Beukes, 2014; Fakir, 2014; Gabel-Shemueli and Capell, 2013; Mihaiu, Opreana and Cristescu, 2010; Shah, 2005)
	3	Government Initiatives	<ol style="list-style-type: none"> 1. Suitable infrastructure and logistics. 2. Competitive input prices. 3. Skills and technology. 4. Innovation and partnerships. 5. Efficient regulation. 6. Effective government offerings. 7. Equitability. 8. Accountability. 9. Improving Performance Management. 	(Kitchen, 2004; Montgomery, 2013; Public Service Act, 1994; White Paper on Transforming Public Service Delivery, 1997)
	4	Batho Pele Principles	<ol style="list-style-type: none"> 1. Consultation – citizens should be consulted about their needs. 2. Standards – all citizens should know what service to expect. 3. Redress – all citizens should be offered an apology and solution when standards are not met. 4. Access – all citizens should have equal access to services. 5. Courtesy – all citizens should be treated courteously. 6. Information – all citizens are entitled to full, accurate information. 7. Openness and Transparency – all citizens should know how decisions are made and departments are run. 8. Value for Money – all services provided should offer value for money. 	(Batho Pele Policy Review, 2003; Public Service Commission Report, 2008; Schwella, 2001; White Paper on Transforming Public Service Delivery, 1997)
	5	Service Delivery Challenges	<ol style="list-style-type: none"> 1. Political issues. 2. Policy issues. 3. Implementation issues. 4. Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction. 5. Acute problems of institutional capacity. 6. Mismanagement of funds. 7. High levels of corruption. 8. A lack of public participation. 	(Alexander, 2010; Akinboade, Kinck and Mokwena, 2012; Ambe, 2016; Beukes, 2014; Burger, 2009; de Visser, 2009; CIDB, 2017; Currstine, 2005; Fakir, 2014; Janse van Rensburg, 2014;

			<ol style="list-style-type: none"> 9. Absence of people centred culture and lack of objectives in the public service. 10. Training and development programs not being underpinned by people first values. 11. Lack of effective monitoring and evaluation mechanisms internally and externally. 12. Strategic planning activities on service delivery are limited to senior management. 13. Poor site management from public servants during construction. 14. Time and cost variations. 15. Skills and competency issues. 	<p>Khumalo <i>et al.</i> 2017; Managa, 2012; Manyathi, Burger and Moritmer, 2021; Mashamaite, 2014; Masiya <i>et al.</i> 2019; Moe and Paivarinta, 2013; Nengwakhulu, 2009; Ngcamu, 2019; Olaregaju and Ibrahim, 2020; Public Service Act, 1994 Visser, 2012)</p>
	6	Government Processes and Decision Making	<ol style="list-style-type: none"> 1. Detailed regulation and central prescription in South Africa has resulted in excessive bureaucracy and lengthy procedures which are against the interests of customers, internal and external. 2. Service deliverers are currently forced to spend too much of their time trying to get decisions made and complying with central requirements, many of which hamper the delivery of services to the customer. 3. Implementing robust risk assessments and management processes at project inception to drive the decision-making process in procurement on public sector projects. 	<p>(Emuze and Smallwood, 2011; Emuze and Smallwood, 2013; Manyathi, Burger and Moritmer, 2021; Masiya, Davids and Mangai, 2019)</p>
	7	Management Strategies for Service Delivery	<ol style="list-style-type: none"> 1. Development of more flexible regulatory frameworks. 2. Improvement of human resource management systems. 3. Development of more results-oriented management systems. 	<p>(Fourie and Poggenpoel, 2016; Jeong, 2003; National Conference on Public Service Delivery, 1997; Osborne and Gaebler, 1992; Public Service Commission Report, 2008; Republic of South Africa, 1996; The World Bank, 2015)</p>

Table 5.2: The Identified Dependent (Observed) Variable, Unobserved Variables and Indicators – Government Policies, Frameworks and the FIDPM

Leading Variable/ Driver	Unobserved Variable	Breakdown of Indicators	Source	
<p><i>Government Policies and Frameworks, FIDPM</i></p> <p>➤ Public service policies since the new government in 1994 have attempted to deal with the complex needs of service delivery institutions and service delivery itself (White Paper on Transforming Public Service Delivery, 1999).</p> <p>➤ As a result, public service and service delivery policies were designed to promulgated and deal with the simultaneous transformation and quest for improved, service delivery orientated public service in South Africa (Schwella, 2001).</p> <p>➤ Public service delivery still exhibits challenges currently (2021) raised in previous years regarding capacity and skills shortages in public servants, highlighting public sectors need for support to address challenges that have hindered the successful implementation of service delivery in South Africa (Provincial Treasury, 2019).</p> <p>➤ The National Treasury Instruction No.3 of 2019/2020 issued, effective from the 01st October 2019 giving effect to the implementation of the FIDPM reinforces governments initiatives towards improving the implementation of service delivery in the country (National Treasury, 2019).</p>	8	Policy Development and Implementation	<ol style="list-style-type: none"> 1. Current policy development in SA and policy implementation addresses and deals with their targeted areas of concern regarding improving public service delivery. 2. Government is good at policy development, understands the policy directions they would like to take, and are successful at implementing policy. 3. The infrastructure delivery model requires a new trajectory in tackling the under-development and triple challenges of poverty, unemployment and slow economic growth. 	(Emuze and Smallwood, 2013; Petunia and Selepe, 2020)
	9	Effective Policy Implementation	<ol style="list-style-type: none"> 1. Departments not having service standards. 2. Service standards not readily available to internal or external clients and therefore clients were unaware of the level of service that could be delivered. 3. Too much emphasis was placed on the responsibilities of government departments and very little emphasis was placed on the responsibilities of the clients who access services. 4. Service standards were sometimes unachievable, thus leading to clients having exaggerated expectations regarding how soon the service could be rendered. 5. Members of staff were often uninformed regarding their departments service standards and were therefore unaware of whether services were delivered to the standards set by their department. 6. Certain departments had rigid and uniform service standards across the whole department, which took no account of local (urban vs. rural) or service variations. 7. Little understanding within some departments that considerable effort is required, beyond simply defining service standards, to implement the concept. 8. Not linking the concept of service standards to current initiatives to reform the public service in South Africa such as the eight Batho Pele principles. 	(Batho Pele Policy Review, 2003; Clapper, 2007; DPSA, 2018; Franks, 2014; Hoffman, 2010; Janudin and Maelah, 2016; National Planning Commission, 2011; PSC, 2000; PSC, 2005; PSC, 2010; PSC, 2015; PSC, 2018; Schussler, 2012; Stats SA, 2018; Stats, SA SDIP Report, 2019)
	10	SCM Public Procurement Challenges	<ol style="list-style-type: none"> 1. Lack of proper knowledge, skills and capacity from public servants. 2. Non-compliance with SCM policy and regulations. 3. Inadequate planning and linking of demand to the budget. 4. Accountability, fraud and corruption. 5. Inadequate monitoring and evaluation of SCM 6. Too much decentralisation of the procurement system. 7. Ineffectiveness of the black economic empowerment (BEE) policy. 	(Ambe and Badenhorst-Weiss, 2012; Arrowsmith, 2010; Acevedo, Rivera, Lima and Hwang, 2010; Bolton, 2006; Jeppesen, 2010; Luyt, 2008; Mahlaba, 2004; Mathee, 2006; McCarthy, 2006; Migro and Ambe, 2008; National Treasury, 2005; National Treasury, 2016; Odhiambo and Kamau, 2003; Sheoraj, 2007; Soudry, 2007; Van Zyl, 2006)
	11	IDMS, SIPDM & FIDPM	<ol style="list-style-type: none"> 1. National Treasury's Infrastructure Delivery Management System (IDMS) as a model for best practice delivery of infrastructure management within the public sector. 	(IDMS, 2014; IDMS, 2019; FIDPM, 2019; SIPDM, 2016)

<p>➤ The FIDPM establishes governance for infrastructure delivery and infrastructure procurement in the public sector and is the key framework which focuses on governance and decision-making points as well as alignment and functions to support management of infrastructure delivery and procurement processes (FIDPM, 2019).</p> <p>➤ Therefore, the implementation of the FIDPM directly impacts/influences the performance outcomes of the public sector targets for service delivery.</p>			<ol style="list-style-type: none"> 2. National Treasury’s Standard for Infrastructure Procurement and Delivery Management (SIPDM) in support of the supply chain for infrastructure procurement and delivery management to all departments, constitutional institutions and public entities. 3. National Treasury Instruction No.3 of 2019/2020 which repealed the SIPDM effective from 01st October 2019 and gave legal effect to the Framework for Infrastructure Delivery and Procurement Management (FIDPM). 		
	12	Government Ability to Apply the FIDPM	<p>Principles</p> <ol style="list-style-type: none"> 1. Policy consistency. 2. Planning alignment. 3. Clarity of responsibility and accountability. 4. Evidence-based decision making. 5. Continuous improvement and scalability (structured to assist all). 6. Continuous capacity and capability building. 	<p>Benefits</p> <ol style="list-style-type: none"> 7. Understanding of delivery and procurement management processes including governance obligations. 8. Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes. 9. Consistent, reliable reporting, based on the full life cycle costs of infrastructure. 10. Development of programme plans, using simple templates and guides. 11. Alignment of the allocated budgets to infrastructure programmes. 12. Improved management of the procurement of supplies, services and engineering and construction works. 13. Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management. 14. Greater level of uniformity of infrastructure project implementation, across different organs of state. 15. Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector. 16. A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience. 17. Senior management will have a tool to hold delivery managers accountable for performance. 18. The quality and value for money of service delivery will improve. 	(IDMS, 2014; IDMS, 2019; FIDPM, 2019)

Table 5.3: The Identified Dependent (Observed) Variable, Unobserved Variables and Indicators – PM Tools and Techniques

Leading Variable/ Driver	Unobserved Variable	Breakdown of Indicators	Source	
<p><i>PM Tools and Techniques</i></p> <ul style="list-style-type: none"> ➤ Experience has proven that the selection of the project manager is an important appointment which can influence the success or failure of the project (Burke, 2019). ➤ The implementation of effective project management to achieve successful project outcomes involves the selection and application of important project management tools and techniques (PMBOK, 2021). ➤ There is a significantly strong relationship between project success and the leadership competencies of the project managers (Geoghegan & Dulewicz, 2008). ➤ There is empirical evidence identified in the literature supporting positive relationship in project management practices and project success, implying that project management practices or standards inherently increase prospects of project success (Papke-Shields et al. 2012). ➤ The use of project management tools and techniques remains imperative in today's environment and that these tools and techniques remain relevant (Ika, 2009). ➤ The main driver behind the application of project management in government is to improve state institution's ability to deliver efficient, effective and high-quality services. Project management can 	13	PM Attributes	<ol style="list-style-type: none"> 1. Select and develop an operational team from a standing start. 2. Leadership and management ability. 3. Anticipate problems, solve problems and make decisions. 4. Integrate project stakeholders. 5. Operational flexibility. 6. Plan, expedite and get things done. 7. Negotiate and persuade. 8. Understand the environment within which the project is being managed. 9. Review, monitor and apply control. 10. Administer the contract, the scope of work and scope changes. 11. The ability to keep the client happy. 	(Bennis, 1997; Burke, 2019; CIOB, 2014; Kerzner, 2019; PMBOK, 2017; PMBOK, 2021; SACPCMP, 2000)
	14	Effective Ways of Introducing Change	<ol style="list-style-type: none"> 1. Defining what has to be accomplished in terms of time, cost and various technical and quality performance parameters. 2. Developing a plan to achieve these and then working this plan, ensuring that progress is maintained in line with these objectives. 3. Using appropriate project management techniques and tools to plan, monitor and maintain progress. 4. Employing a skilled project manager, who is given responsibility for introducing the change and is accountable for its successful accomplishment. 	(APM PMBOK, 2019; PMBOK, 2017; PMBOK, 2021)
	15	Skill Sets of Effective PM's	<ol style="list-style-type: none"> 1. Technical Project Management - The knowledge, skills and behaviours related to specific domains of project. 2. Leadership - The knowledge, skills and behaviours needed to guide, motivate and direct a team. 3. Strategic and Business Management - The knowledge of and expertise in the industry and organisation. 	(PMBOK, 2017; PMBOK, 2021)
	16	Ten Areas of Expertise and Service Delivery Challenges	<ol style="list-style-type: none"> 1. Policy issues. 2. Implementation issues. 3. Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction. 4. Acute problems of institutional capacity. 5. Mismanagement of funds. 6. A lack of public participation. 7. Absence of people centred culture and lack of objectives in the public service. 8. Training and development programs not being underpinned by people first values. 9. Lack of effective monitoring and evaluation mechanisms internally and externally. 10. Strategic planning activities on service delivery are limited to senior management. 11. Poor site management from public servants during construction. 12. Time and cost variations. 13. Skills and competency issues. 	(Egbu and Robinson, 2005; Girmscheid and Hartmann, 2002; Lawless, 2007; PMBOK, 2017; PMBOK, 2021; Rwelamila and Jerling, 2011; Sommerville and Craig, 2006; Van der Waldt, 2007)
	17	Key Institutional Goals	<ol style="list-style-type: none"> 1. To be more responsive and relevant to the needs of citizens. 2. To be more efficient and effective in the use of public resources. 	(IDMS, 2014; IDMS, 2019; FIDPM, 2019; PMBOK, 2017; PMBOK, 2021;

support the achievement of institutional goals as well as give greater assurance to stake holders that resources are effectively managed (Srivannaboon and Milosevic, 2006).			<ol style="list-style-type: none"> 3. To be more representative of the diversity and needs of all, especially the most disadvantaged sectors of society. 4. To improve access to services, make them more responsive to the needs of citizens. 5. To be more flexible and more efficient in the use of allocated funding. 6. To remove the command/ control approach of management and accompanying excess regulation. 7. To have the ability to adjust policies and processes when societal problems are detected. 8. To better utilise technology in the delivery of services. 	Srivannaboon and Milosevic, 2006)	
	18	Application of IDM Toolkits Principals and Benefits by PM's	<p>Principles</p> <ol style="list-style-type: none"> 1. Policy consistency. 2. Planning alignment. 3. Clarity of responsibility and accountability. 4. Evidence-based decision making. 5. Continuous improvement and scalability (structured to assist all). 6. Continuous capacity and capability building. 	<p>Benefits</p> <ol style="list-style-type: none"> 7. Understanding of delivery and procurement management processes including governance obligations. 8. Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes. 9. Consistent, reliable reporting, based on the full life cycle costs of infrastructure. 10. Development of programme plans, using simple templates and guides. 11. Alignment of the allocated budgets to infrastructure programmes. 12. Improved management of the procurement of supplies, services and engineering and construction works. 13. Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management. 14. Greater level of uniformity of infrastructure project implementation, across different organs of state. 15. Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector. 16. A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience. 17. Senior management will have a tool to hold delivery managers accountable for performance. 18. The quality and value for money of service delivery will improve. 	(IDMS, 2014; IDMS, 2019; FIDPM, 2019)
	19	Implementation of IDM Toolkits Principals and Benefits in FIDPM Work Stages	<p>Principles</p> <ol style="list-style-type: none"> 1. Policy consistency. 2. Planning alignment. 3. Clarity of responsibility and accountability. 4. Evidence-based decision making. 	<p>Benefits</p> <ol style="list-style-type: none"> 7. Understanding of delivery and procurement management processes including governance obligations. 8. Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes. 9. Consistent, reliable reporting, based on the full life cycle costs of infrastructure. 	(IDMS, 2014; IDMS, 2019; FIDPM, 2019)

			<p>5. Continuous improvement and scalability (structured to assist all).</p> <p>6. Continuous capacity and capability building.</p>	<p>10. Development of programme plans, using simple templates and guides.</p> <p>11. Alignment of the allocated budgets to infrastructure programmes.</p> <p>12. Improved management of the procurement of supplies, services and engineering and construction works.</p> <p>13. Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.</p> <p>14. Greater level of uniformity of infrastructure project implementation, across different organs of state.</p> <p>15. Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.</p> <p>16. A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.</p> <p>17. Senior management will have a tool to hold delivery managers accountable for performance.</p> <p>18. The quality and value for money of service delivery will improve.</p>	
--	--	--	---	--	--

The Improved Service Delivery Conceptual Model

The conceptual model seeks to predict the barriers of the FIDPM's implementation over the duration of the research period (2019-2021) as well as identify the role that project managers can play by the utilisation and application of their tools and techniques towards improving government's initiatives towards successful infrastructure service delivery. The model depicts that improved service delivery is dependent on three variables (1) the public sector, (2) government policies, frameworks and the FIDPM and (3) PM tools and techniques which are the identified points classified therein under the drivers or leading variables. The conceptual model was tested and validated via the survey questionnaire which was presented in chapter 8. The 19 unobserved variables supplemented by 160 indicators identified in Tables 5.1 – 5.3 stems from research sources identified earlier from literature.

5.5 Hypotheses to be Tested

The conceptual model in Figure 5.1 illustrates 22 hypothesised relationships, 19 between the unobserved variables and the drivers (leading/ observed variables) and three between the dependent variable and the drivers. The model predicts a direct positive relationship between the following unobserved and leading variables/ drivers and the dependent variable.

Leading Variable/ Driver 1 – The Public Sector

H₁: A positive relationship is predicted between *Recurring Problems in the Public Sector* and the public sector.

H₂: A positive relationship is predicted between *Public Service Transformation Strategies* and the public sector.

H₃: A positive relationship is predicted between *Government Initiatives* and the public sector.

H₄: A positive relationship is predicted between *Batho Pele Principles* and the public sector.

H₅: A positive relationship is predicted between *Service Delivery Challenges* and the public sector.

H₆: A positive relationship is predicted between *Government Processes and Decision Making* and the public sector.

H₇: A positive relationship is predicted between *Management Strategies for Service Delivery* and the public sector.

Leading Variable/ Driver 2 – Government Policies, Frameworks and the FIDPM

H₈: A positive relationship is predicted between *Policy Development and Implementation and Government Policies, Frameworks and the FIDPM*.

H₉: A positive relationship is predicted between *Effective Policy Implementation and Government Policies, Frameworks and the FIDPM*.

H₁₀: A positive relationship is predicted between *SCM Public Procurement Challenges and Government Policies, Frameworks and the FIDPM*.

H₁₁: A positive relationship is predicted between *IDMS, SIPDM & FIDPM* and *Government Policies, Frameworks and the FIDPM*.

H₁₂: A positive relationship is predicted between *Government Ability to Apply the IDM Principles and Benefits through the FIDPM* and *Government Policies, Frameworks and the FIDPM*.

Leading Variable/ Driver 3 – PM Tools and Techniques

H₁₃: A positive relationship is predicted between *PM Attributes* and PM tools and techniques.

H₁₄: A positive relationship is predicted between *Effective Ways of Introducing Change* and PM tools and techniques.

H₁₅: A positive relationship is predicted between *Skill Sets of Effective PM's* and PM tools and techniques.

H₁₆: A positive relationship is predicted between *Ten Areas of Expertise and Service Delivery Challenges* and PM tools and techniques.

H₁₇: A positive relationship is predicted between *Key Institutional Goals* and PM tools and techniques.

H₁₈: A positive relationship is predicted between *Application of IDM Toolkits Principles and Benefits by PM's* and PM tools and techniques.

H₁₉: A positive relationship is predicted between *Implementation of IDM Toolkits Principles and Benefits in FIDPM Work Stages* and PM tools and techniques.

Improved Service Delivery

H₂₀: A positive relationship is predicted between *The Public Sector* and improved service delivery.

H₂₁: A positive relationship is predicted between *Government Policies, Frameworks and the FIDPM* and improved service delivery.

H₂₂: A positive relationship is predicted between *PM Tools and Techniques* and improved service delivery.

5.6 Chapter Summary

This chapter presented the proposed improved service delivery model based on the three key drivers identified through the literature. The public sector, government policies, frameworks and the FIDPM, and PM tools and techniques were highlighted as important drivers towards improving service delivery. The chapter further emphasised, the need for a conceptual model stemmed from assisting the researcher identify and construct their view point and asserted remedies to the identified problem and accentuated the reason for the topic of study. The model was developed on three leading variables, 19 unobserved variables supplemented by 160 indicators which were supported from the literature. The conceptual model illustrated 22 hypothesised relationships.

CHAPTER 6 – RESEARCH METHODOLOGY

6.1 Introduction

This chapter presents the research methodology designed to achieve the research aim and objectives. The chapter explains the research process and approaches including research paradigms, the research methodology and methods used. The relationship between the research methods and objectives, data collection, sampling methodology and data analysis techniques are highlighted. In addition, the credibility, reliability and validity of the research findings including ethical considerations are presented.

6.2 Research Exemplified

Research is a systematic investigation or activity to gain new knowledge of the already existing facts. It is also an intellectual activity, as it is responsible for bringing to light new knowledge (Kothari, 2020). In addition, research can also correct present mistakes and remove existing misconceptions and add new learning to the existing fund of knowledge (Kumar, 2019). Furthermore, research is considered the application of scientific method in solving a problem. It can be described as a systematic, formal and intensive process of carrying out the scientific method of analysis. (Hayden, Levy and Thompson 2007; Sharma, 2008)

6.3 Research Process

The research methodology for this study was adopted from the “Research Process Onion Model” presented in Figure 6.1 developed by Saunders, Lewis and Thornhill (2019: 130). The first layer is the research philosophies. The second layer is the research approach. Thereafter are the research choices followed by the research strategies and then time horizons. The final layer is the techniques and procedures for data collection and analysis.

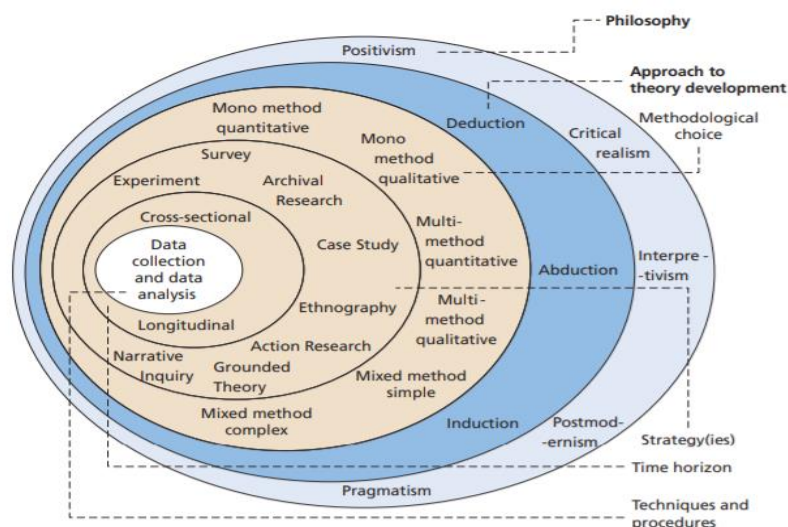


Figure 6.1: The Research Onion (Saunders, Lewis and Thornhill, 2019: 130)

In this study, a methodological objective philosophy was implemented through a positivist paradigm. A scientific method of writing was used as the object of research was to create new knowledge. The methodology was a quantitative strategy which utilised survey research. The method adopted was questionnaires. This study utilised a positivist paradigm as the development of a public service delivery model for the construction industry required a highly structured quantitative measurement including large samples and hypothesis testing which can be generalised to the sample population. Figure 6.2 presents the research process adopted for this study.

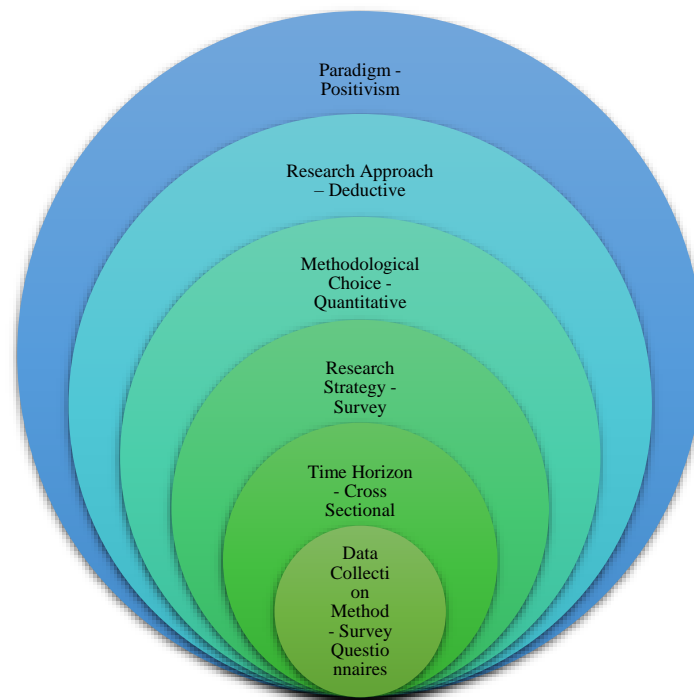


Figure 6.2: The Research Process Adopted for this Study

6.3.1 Research Paradigms

Saunders *et al.* (2019) explains that a paradigm is a way of examining social phenomenon from which particular understandings of these phenomena can be gained and explanations attempted (Saunders *et al.* 2019). Burrell and Morgan (2016) further note that a paradigm is a set of basic assumptions that underwrites the frame of reference, the mode of theorising including ways of working in which a group operates.

A paradigm that is rooted in the physical sciences is called the systematic, scientific or positivist approach. While the opposite paradigm is known as the qualitative, ethnographic, ecological or naturalistic approach (Kumar, 2019). Kumar (2019) further highlights that it is the purpose which a research activity is undertaken that should determine the mode of enquiry, as a result, the paradigm.

Key research paradigms in the management field include positivism, critical realism, interpretivism, postmodernism and pragmatism (Korthari, 2020; Saunders *et al.* 2019).

However, this study focused on positivism which relates to the philosophical stance of the natural scientist which entails working with an observable social reality to produce law-like generalisations (Saunders *et al.* 2019). In addition, positivism discovers contributors to probability within situations of cause and effect (Creswell and Poth, 2018). Positivists focus primarily on scientific empiricist methods designed to yield pure data and facts that are uninfluenced by human interpretation or bias (Bell, Bryman and Harley, 2019; Kivunja and Kuyini, 2017; Saunders *et al.* 2019).

6.3.2 Research Approach/ Design

The research design is a framework or plan for a study that is utilised as a guide with the aim of collecting and analysing data and is essentially a blueprint that is followed in completing a study (Bell *et al.* 2019; Pandey and Pandey, 2015). In addition, Saunders *et al.* (2019) emphasises that the extent to which research is concerned with theory testing or theory building brings to light an important question regarding the design of the research study. Two contrasting approaches for theory development portray the reasoning for a researcher to adopt the deductive or inductive approach (Bell *et al.* 2019)

Ketokivi and Mantere (2010) further explains that deductive reasoning usually occurs when the conclusion is derived logically from a set of derived theory premises and as a result, the conclusion being true when all premises are true. On the other hand, inductive reasoning there is usually a gap in the logic argument between the conclusion and premises observed and as a result, the conclusion being judged to be supported by the observations made.

Deductive and Inductive Approaches

The deductive approach involves a theory and hypothesis being developed, and a research strategy designed to test the hypothesis (Kumar 2019). The deductive approach entails the development of a theory subjected to a rigorous test and is the dominant research approach in the natural sciences, where laws provide the basis of explanation, permit the anticipation of phenomena, predict their occurrence and allow them to be controlled (Gulati, 2009; Saunders *et al.* 2019) In addition, deductive methods are important such as testing of theories, specifying important variables and making comparisons amongst groups (Creswell and Poth, 2018; Kothari 2020).

The inductive approach involves data being collected and a theory developed as a result of the analysis (Saunders *et al.* 2019). Beiske (2007) explain that in this approach the observations are the starting point for the research, thereafter patterns are searched for in the data. There is usually no framework that

informs the data collection and as a result, the research focus can be formed after the data is collected (Bell *et al.* 2019).

The nature and characteristics of this research stemmed from the need to use the deductive approach, which required the development of a theory, hypotheses and a research strategy to test the hypotheses. The theory was developed through the literature review and the hypotheses were tested through the survey questionnaires. A key characteristic identified using the deductive approach was that first the casual relationships between the variables needed to be explained and then the hypotheses were tested utilising the collection of quantitative and qualitative data (Saunders *et al.* 2019). Furthermore, as supported by Kothari (2020) the deductive approach was suited to the positivist approach as it permitted the formulation of hypotheses and statistical testing of expected results to an accepted level of probability.

The next three layers in this study unpacks the research choices, research strategies and time horizons. Saunders *et al.* (2019) reinforces that these three layers focus on the research design, which turns the research questions into a research project.

6.3.3 Methodological Choice

Numerous good practice guides on research and PhD research in particular recommend choosing a methodology that is feasible and appropriate (Mukherjee, Hoare and Hoare, 2002) Mukherjee *et al.* (2002) notes that all research approaches have something to offer. Denscombe (1998) further states that research methodologies are selected because they are appropriate. Methodological choices are more often determined by the factors surrounding the research (Mukherjee, *et al.* 2002). In addition, MacDonald and Headman (2009) note that in any form of research, the researcher will be required to count things and/ or interact and talk to people.

Quantitative, Qualitative and Mixed Methods Research

Quantitative method – is a data collection technique (for example a survey questionnaire) or data analysis procedure (through graphs and statistics) which generates and uses numerical data (Saunders *et al.* 2019). Kothari (2020) further reinforces that quantitative data refers to numerical and statistical data which can be a product of all research strategies. In addition, quantitative methods measure the occurrence of various views and opinions in a chosen sample (Jonker and Pennink, 2010; MacDonald and Headman, 2009). This method seeks to gather data that is factual and aims to study relationships between fact. The analysis of this data yields quantified results and conclusions which are derived from evaluating the results in respect to the theory and literature. Furthermore, quantitative methods are scientific and position the researcher as a neutral observer of phenomena which is critical in maintaining objectivity (Bell *et al.* 2019). Quantitative research is usually based on positivistic ideals and are

assumed to be repeatable including being capable of isolation from reality without the cause and effect of research being compromised (Kumar, 2019)

Qualitative method – is a data collection technique (for example an interview) or data analysis procedure (forming themes) which usually generates and uses non-numerical data (Saunders *et al.* 2019). It consists of data represented in the format of fieldwork notes, words, interview transcripts and texts. In addition, the nature of the data has implications for its collection and analysis (Kothari, 2020). MacDonald and Headman (2009) further note that this method provides insights into the setting of a problem which generates ideas and hypotheses. Sutrisna and Barrett (2007) highlight, that qualitative methods are considered capable of studying complex situations and can yield rich research findings while acknowledging the researchers influence in shaping the findings of the research. Qualitative research considers the subjective dimension of reality and emerges from the constructivism and interpretivism continuum (Kumar, 2019). However, qualitative research is not always easy to conduct as complexity, interconnected family of terms, concepts including assumptions are linked to the term qualitative research (Bell *et al.* 2019).

Mixed methods – involves the use of both quantitative and qualitative data collection techniques including analysis procedures are implemented in the research design (Creswell and Poth, 2018; Teddlie and Tashakkori, 2012). Mix methods research can use both data collection techniques in parallel or sequential, but does not combine both. (Saunders *et al.* 2019; Watkins and Gioia, 2015).

This study adopted the quantitative methodology. The aim of the research was to count “things” in an attempt to explain what was observed. While the purpose was generalisability, predictions and causal explanations. In addition, tools such as surveys were used to collect numerical data. The data collection was structured, and the output was in the form of numbers and statistics. The philosophy was objective as it seeks precise measurement and analysis. Furthermore, the role of the researcher entailed being objectively separated from the subject matter. Finally, the analysis was statistical.

6.3.4 Research Strategies and Designs

Saunders *et al.* (2019) mentions that the way in which the researcher chooses to answer the research question will be influenced by the research philosophy and approach. As a result, the research question will subsequently influence the selection of research choice of collection techniques, the research strategy and design including the time horizon over which the study will be undertaken (Kumar, 2019). The research design is essentially the general plan of how the researcher intends answering the research question/s. It has clear objectives, which are derived from the research question/s and specifies the sources from which the data is collected including the constraints on the research as well as ethical issues (Saunders *et al.* 2019; Walliman, 2017). There are various research designs, namely, exploratory

studies (Saunders *et al.* 2019), descriptive studies (Kothari, 2020), explanatory studies (Saunders *et al.* 2019), case Study (Bell *et al.* 2019), action research (Bryman and Bell, 2011), grounded theory (Saunders *et al.* 2019), ethnography (Bell *et al.* 2019), archival research (Flick, 2011), and survey (Kothari, 2020).

The survey utilises quantitative research projects which involve sampling a representative proportion of the population (Bryman and Bell, 2011). Surveys produce quantitative data which can be empirically analysed and are the most commonly utilised to examine causative variables between different types of data (Kothari, 2020; Saunders *et al.* 2019).

This study implemented the survey design through the deductive approach as it is used for exploratory and descriptive research. This design allowed a large amount of data to be collected from a sizeable population in a very economical way. The survey allowed quantitative data to be collected and analysed quantitatively using descriptive and inferential statistics in order to suggest relationships between variables and thereafter produce models of the relationships.

6.3.5 Time Horizons

A key question to be asked when planning a study is whether the researcher would like the research to be a snapshot of a particular period in time, or whether the researcher prefers the research to be a series of snapshots of events over a selected period of time. The snapshot time horizon is called cross-sectional, and the series of snapshots time horizon is called longitudinal. (Saunders *et al.* 2019). Cross-sectional research involves a study of a particular phenomenon at a particular time and usually employ the survey strategy where data must be collected at a certain point. These types of studies are cross-sectional in terms of both the study population and the time of investigation (Kumar, 2019).

The cross-sectional time horizon was adopted as the investigation concerned involved executing the study of a particular phenomenon at a specific time. In addition, the study entailed one contact with the study population and was comparatively affordable to implement and straight forward to analyse.

6.3.6 Data Collection Methods

Once the research problem has been formulated, the study design developed, a research instrument constructed and a sample was selected, the researcher may then collect data from which inferences and conclusions are drawn for the study (Kothari, 2020; Kumar, 2019). Pandey and Pandey (2015) emphasise that researchers require many tools and techniques for gathering data. In addition, tests are the tools of measurement as it guides the researcher in both data collection and evaluation. Furthermore, these tools may vary in complexity, interpretation including design and administration.

This study was implemented through a two-stage approach highlighted in Figure 6.3. Stage one entailed establishing a need for the study through an in-depth literature review, developing a conceptual model and the development of the research questions. The intent of a literature review is to search through all information sources available and track down the latest knowledge, assess it for relevance, quality, controversy and identify gaps in the research in a systematic approach (Finke, 2010). The review of literature aims to introduce the latest concepts and advances in thinking in the selected research topic by citing relevant papers, publications and authors to underpin the description (Machi, McEvoy and Press, 2018).

Stage two involved the use of a Delphi study in which a survey questionnaire was distributed to a panel of experts to understand the key drivers to poor service delivery, the efficiency of public sector policy and frameworks and the PM tools and techniques for improving public service delivery. This validated the survey questionnaire that was distributed nationally. Thereafter, analysing and modelling of the results was conducted to determine the model best fit. Figure 6.3 presents the data collection approach for this study. This study adopted the literature review, the Delphi study, and the survey questionnaire as the methods for data collection.



Figure 6.3. Data Collection Approach for this Study

In order to ensure the adopted research methodology and methods achieved the research aims and objectives Table 6.1 summarises the methods applied to address the objectives.

Table 6.1 Research Methods Assigned to Achieve Research Methods

Research Stage		Objective	Data Collection Method	Data Analysis Method	Outcome	Chapter
1	Literature Review	Investigate and describe the current body of knowledge: <ul style="list-style-type: none"> • The built environment and the public sector, • Service delivery and its challenges in the construction industry, • Government frameworks and policies implemented to drive service and infrastructure delivery, • The FIDPM, • PM and its role towards addressing service delivery challenges. 	Literature Review	Literature Synthesis	<ul style="list-style-type: none"> • The role of the public sector in the built environment, • The status and Impacts of service delivery challenges, • The status of key frameworks and policies used to implement service delivery, • Impacts of the FIDPM, • PM tools and techniques for improving service delivery. 	2, 3 and 4
	Develop Research Model	To develop a conceptual model for improving the implementation of the FIDPM in the public sector through the utilisation of PM tools and techniques towards successful public service delivery.	Desktop Study	Theory	Improved service delivery model.	5
2	Delphi Method	To determine the factors that drive poor service delivery, efficiency of public sector frameworks and policy, the PM tools and techniques for improving service delivery.	Delphi Study	Descriptive Statistics	Consensus on the drivers for poor service delivery, efficiency of public sector frameworks and policy, the PM tools and techniques for improving service delivery.	7 and 8
	Survey Questionnaire	<ul style="list-style-type: none"> • Test and validate the model for improved service delivery. • Evaluate the practical and statistical importance of the hypothesised paths in the proposed model. 	Survey Questionnaire	Explanatory factor analysis, Confirmatory factor analysis, and Path Modelling	Validated model, Goodness-of-fit test results.	9

6.4 Sampling

It is noted by Kothari (2020) that in any field of inquiry all items constitute a “universe” or “population”. When there is a complete enumeration of all items in the population, it is known as a census enquiry. Furthermore, in such an inquiry which covers all items, and no element of chance is left, the highest accuracy is obtained (Saunders *et al.* 2019; Kothari, 2020). However, in most cases it is not always possible to examine every item in the population and it may be possible to obtain sufficiently accurate results by studying only a part of the entire population (Walliman, 2017). Therefore, sampling is the process of selecting a small group of cases out of a large group, in other words, it is a definite plan for obtaining a sample from a given population (Kumar, 2019; Kothari 2020; Saunders *et al.* 2019).

There are two types of sampling techniques, probability sampling and non-probability sampling. Probability sampling techniques provide the most reliable representation of the whole population, where-as non-probability sampling techniques relies on the judgement of the researcher and as a result, cannot be used to make generalisations about the whole population (Walliman, 2017; Saunders *et al.* 2019). Figure 6.4 exemplifies the different sampling techniques in research.

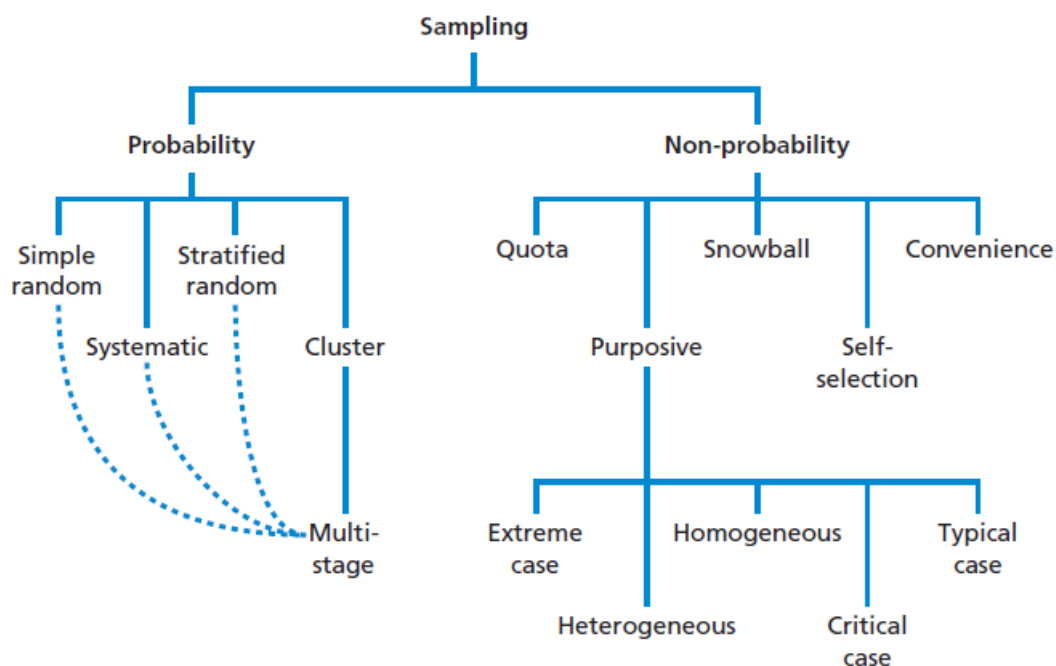


Figure 6.4: Sampling Techniques (adapted from Saunders *et al.* 2019: 213)

6.4.1 Probability Sampling

Probability sampling is commonly associated with survey-based research strategies where the researcher needs to make inferences from the sample about a population with the aim of answering research questions to meet the objectives (Saunders *et al.* 2019). Walliman (2011) further notes that in probability sampling, random methods are used to select the sample. The selection procedure aims to guarantee that each element (person, group, class, type) has an equal chance of being selected including every combination of the elements also has an equal chance of being selected (Kothari, 2020). Specific probability designs are utilised for selecting representative samples from a population with different characteristics. These include simple random, systematic, stratified random, cluster and multi-stage (Saunders *et al.* 2019).

This study adopted stratified random sampling as it entails the researcher stratifying the population in order to ensure that the population within a stratum is homogenous in alignment to the characteristic on

the basis of which it is being stratified (Saunders *et al.* 2019). In addition, the characteristics selected as the basis of stratification are identifiable in the study population (Kumar, 2019). Furthermore, the characteristic that becomes the basis of stratification needs to be related to the main variable the research is exploring (Kothari, 2020; Walliman, 2017).

The sample selection for this study was seen as critical and immense care was taken when deciding on the sample design. It was key to ensure that the characteristics of the sample were in line with the population in order to act as a representative of the population as a whole. Purposive sampling was used to execute the Delphi study which is discussed further in chapter 7. In addition, the key steps adopted in the sample design for this study as highlighted by Kothari (2020) were:

- *Type of universe* – a finite universe was defined for the study which entailed selecting all professional registered construction project managers (PrCPMs) with the SACPCMP.
- *Sampling unit* – a decision was taken in this study to ensure that the sampling unit selected included all PrCPMs in the provinces of KwaZulu-Natal, Gauteng and Western Cape as these provinces are the most active as identified in the South African Cities Network report in terms of public service delivery within the country.
- *Source list* – the sampling frame utilised to identify the sample was the SACPCMP database.
- *Size of sample* – the number of items selected from the universe to constitute a sample entailed selecting all PrCPMs registered with the SACPCMP from KwaZulu-Natal (232), Gauteng (675) and Western Cape (278). A total of 1185 registered professionals across all three provinces in South Africa (South African Cities Network, 2016).
- *Parameters of interest* – the specific population parameters of interest for this study involved identifying a proportion of persons with some characteristics in the population. As a result, the research parameters set out to identify professionally registered PrCPMs working on public sector construction projects, specifically where the FIDPM has been released for implementation within the selected geographical regions.
- *Budgetary constraint* – considerations for cost from a practical point of view impact the decisions relating to the size and type of sample. Therefore, it was decided that the questionnaire will be emailed to the sample population and the responses emailed back to the researcher for consolidation and analysis thereafter towards ensuring the financial implications on the research is managed accordingly.
- *Sampling procedure* – the purpose for sampling is to gather data about the population in order to make an inference that can be generalized to the population. Stratified random sampling was used as this approach entailed the researcher stratifying the population to ensure the population with the stratum was homogenous in alignment to the characteristics on the basis of which it was stratified.

Table 6.2 indicates the three provinces together with the number of emails sent out including the total number of valid emails and the response rate. Four hundred and ten completed questionnaires were received indicating a response rate of 34.59%. Collis and Hussey (2014) supported by Gill Johnson and Clark (2010) identify that for a population size of 1000 a sample of 278 is required. In addition, according to Akintoye and Fitzgerald (2000); Odeyinka, Kelly and Perera, (2009); Gillham (2000); Fellows and Liu (2008) a 30%-40% is deemed as the acceptable norm in most postal questionnaires in the construction industry. Magd (2006) and Saunders *et al.* (2019) supports this argument through suggesting a response rate of between 30%-50% as appropriate. The South African construction industry is known for its lack of participation in research. Therefore, a sample of 410 (34.59%) for this study was deemed adequate.

Table 6.2: Emails issued to Study Sample

No.	Province	No. of PrCPMs listed and emails sent out	Emails undeliverable	Total No. of valid emails	No. of responses received
1	KwaZulu-Natal	232	0	232	82
2	Gauteng	675	0	675	229
3	Western Cape	278	0	278	99
Total		1185	0	1185	410

The loss of balance including accuracy in the use of research methods is termed bias. It is the unwanted distortion of the results of a survey due to parts of the population being represented more than others (Walliman, 2017). Bias is able to creep into research through sampling, interviewing, designing of questionnaires and the way in which data are analysed and presented. This means that the research findings will not be representative or generalisable to a wider population (Bell *et al.* 2019).

While bias cannot be removed entirely from survey research, the researcher can implement mitigation strategies to limit the impact of errors (Williams and Baker, 2010). A respondent-centred approach was implemented to reduce response bias during the questionnaire design, data cleaning including validity and reliability checking were adopted. Three factors were looked at and responded to in this study by the researcher towards eliminating as much bias as possible.

- *Sampling frame bias* – this was avoided by ensuring that a current list of registered PrCPMs with the SACPCMP were obtained withing the acceptable sampling frame.
- *Researcher bias* – this bias was reduced by ensuring that a structured questionnaire was used, so that the same questions could be asked in the same order.
- *Non-response bias* – while this bias could not be entirely avoided, the researcher reduced the bias by ensuring that the research objectives were clearly explained, creating simplified and easy to understand and answer questions by removing ambiguity from the questionnaire.

6.5 Survey Questionnaire

This study entailed selecting a survey research design. According to Saunders *et al.* (2019) and Kothari (2020) surveys are a prevalent method of collecting data. Survey research usually involves any measurements procedures that entail asking respondents questions. It is a flexible tool that can produce qualitative and quantitative information based on how they are structured and analysed and can be administered through interviews or questionnaires (Walliman, 2017).

A survey questionnaire is highlighted by Saunder *et al.* (2019) to include all data collection techniques in which each person is asked to respond to the same set of questions through a predetermined order. Authors such as Kervin (2004) reserve it exclusively for surveys where the person answering the question actually records their own answers. Bell (2005) note it as a general term to include interviews that are administered face to face or by telephone. A more diversified definition of a questionnaire is exhibited by Leedy (2009) as a set of written questions for respondents to complete themselves. It is a data-gathering device that elicits from a respondent the answers or reactions to pre-arranged printed questions presented in a specific order (Kumar, 2019). In addition, it is one of the most widely used data collection techniques within the survey strategy (Kothari 2020).

The advantages of utilising questionnaires in research are that they are less expensive to administer and offers great anonymity while major disadvantages include, low response rate, self-selecting bias and the opportunity for clarification is lacking (Kumar, 2019)

Scaling and measurement

The questions used the Likert rating scale as respondents were presented with a question in the questionnaire and asked to indicate their response on scales consisting of a five-point and numeric rating scale for example (Kumar, 2019). In addition, a Likert scale scores each case by adding together the scores of each question selected (Bell *et al.* 2019). The Likert scale aims to measure intensity of feelings about the area in question (Kothari, 2020).

Coding data

Data that is intended to be analysed statistically by a computer needs to be coded prior to entry. According to Kothari (2020) coding involves the process of assigning numerals or symbols to answers to enable responses to be placed into a limited number of categories or classes which are in alignment with the research problem under consideration. Coding is important in quantitative data as the responses need to be converted into numbers for statistical analysis (Kothari, 2020). Thereafter, the researcher needs to ensure that the data “cleaned” in order to review and check the accuracy of the coding and correct errors (if any) (Kumar, 2019). Once the researcher is in possession of a clean electronic data base, then statistical analysis may commence (Saunders *et al.* 2019)

In this study, the questionnaire was used in both stages. In stage one it was implemented in the Delphi study to identify the drivers to improved public service delivery which is elaborated further in chapter 7. The questionnaire was implemented in stage two to obtain information from the built environment construction industry nationally. It was implemented as a data collection method as they generate data in a systematic and structured fashion and the responses easily quantified, categorised and thereafter subjected to statistical analysis. The questionnaire survey instrument comprised of close ended questions. Close ended questions and Likert scale questions which were coded were used.

6.5.1 Pilot Study

According to Walliman (2017) it is common to pre-test the questionnaire on a small number of people prior to using it in earnest. This is termed, a pilot study. The purpose of the pilot study aims to refine the proposed questionnaire so that respondents can answer the questions with no problems and the data can be recorded systematically with no difficulties (Saunders *et al.* 2019; Bell *et al.* 2019).

A pilot study for the Delphi was conducted in February 2021 with three built environment professionals from the construction industry towards ensuring the questions could be refined including testing the clarity and intelligibility of questions as well as identify ambiguity and repetition. Thereafter the questionnaire was amended, and the Delphi study commenced in March 2021. The pilot study for the national questionnaire commenced in May 2021 with five built environment professionals from the construction industry and the survey questionnaire was sent out in June 2021. The purpose and intent of the pilot study was to ensure that the survey questionnaire instructions were clear, understandable and that the participants knew their role and to remove ambiguities and determine the timeframe. In addition, the researcher ensured that the time it took to complete the questionnaire was measured, the researcher revised the questionnaire by removing redundant and duplicate items.

Towards ensuring that the response rate was achievable a covering letter was included which introduced the research aim and objectives and the questionnaire to the respondents in the study (Appendix D). Furthermore, the respondent's confidentiality was assured, and the questionnaires were designed to be simple and easy for respondents to complete with clear instructions provided on how to complete the questionnaire.

6.5.2 Instrument Administration

The procedures adopted in the data collection entailed:

- *The Delphi Study*
 - The Delphi questionnaire (Appendix B) was design using Microsoft Excel and was emailed to the identified participants.

- The confidentiality and anonymity of the responses including the procedure and research aims were outlined to the participants.
- Purposive sampling was used to select the participants.
- It was noted that participation was voluntary.
- The Delphi study commenced in March 2021 and was concluded in April 2021.

➤ *The Survey Questionnaire*

- The national survey questionnaire (Appendix E) was designed using Microsoft Excel and emailed via the SACPCMP to participants.
- In addition, the confidentiality and anonymity of the responses including the procedure and research aims were outline to the participants.
- PrCPMs listed on the SACPCMP database were selected through random stratified sampling.
- It was noted that participation was voluntary.
- Reminder emails were circulated every 2 weeks for the first month.
- The survey was carried out over a period of eight weeks.

6.6 Data Analysis

In order for data to be useful it needs to be analysed and interpreted. Quantitative data analysis techniques are used for this process. (Saunders *et al.* 2019). Analysis refers to computation of certain measures which include searching for patterns of relationships which exist within data groups (Bell *et al.* 2019).

Chapter 8 discusses the analysis of the Delphi study while the data analysis techniques for the national survey questionnaire is discussed below.

6.6.1 Data Screening/ Cleaning and Preparation of the National Survey Questionnaire

Assessment for internal consistency, exploratory factor analysis and confirmatory factor analysis were analysed using IBM SPSS version 27, while path modelling was implemented using Amos version 26.

Prior to inputting data into a computer programme, the data was edited (cleaned) and coded which is regarded as the “first step” by Kumar (2019) and Kothari (2020). Data screening and preparation for this study was executed in the following approach:

- The sample size was considered,
- An examination of the missing data,
- Evaluating univariate and multivariate normality,

- The consideration of outliers, and
- Item parcelling.

6.6.1.1 Sample Size

There is no consensus with regard to what the sample size suitable for path modelling or structural equation modelling (SEM) should be (Hair, Sarstedt, Ringle and Gudergan, 2018; Tabachnick and Fidell, 2019).

According to Schumacker and Lomax (2016) there have been attempts to adapt SEM to work with smaller samples. However, Kline (2016) argues it is true that SEM is a large sample technique. through the examination of multiple research articles identify that the minimum sample size should be 100 to 150. Whereas for SEM, medium to larger samples are required (Akinyode, 2016). Gaur and Gaur (2009) consider a sample size of 200 to 300 as suitable for proper analysis. In addition, Kline (2016) highlights that a sample size of less than 100 respondents per estimated parameter as small. In comparison, a sample size between 100 and 200 as medium and greater than 200 to be considered as a large sample size (Kline, 2016). In this study the response rate of 410 respondents falls within the recommendations and is considered as a large sample.

6.6.1.2 Missing Data

According to Pallant (2020) missing data arises in different ways which are, missing completely at random (MCAR) or missing at random (MAR). The statistical analysis software usually reserves a specific code for missing data. As a result, cases for missing data may be excluded when necessary or the reasons for missing data can be distinguished using different codes (Kline, 2016; Hair *et al.* 2018)

Data that is missing indicates a systematic loss of data which is important in the data cleaning and screening process. In addition, it is critical to address missing data before proceeding in the data analysis through SEM (Akintoye, 2016). This is usually resolved by running the descriptive analysis through SPSS and noting the extent of the problem (Kline, 2016). When missing data is discovered, the researcher should revert to the raw data and the exact questionnaire for the purpose of inciting the missing data (Hair *et al.* 2018)

If there are a few missing cases (less than 5% of a single variable) it will be of minimal concern. (Tabachnick and Fidell, 2019). Options available to address missing data include deleting cases with missing values through pairwise or listwise deletion, replacing missing data values with the mean of a variable and lastly using robust statistical procedures that accommodate for the presence of missing

data (Hair *et al.* 2018; Kline, 2016). Due to their being no missing values in the dataset including the random pattern of missingness, there was no need to test for missingness conducted.

6.6.1.3 Univariate and Multivariate Normality

Statistical tests known as parametric statistical tests have two classes, descriptive and inferential. According to Walliman (2017) the descriptive test reveals the shape of the data identifying how the values of a variable are distributed whereas the inferential test suggests or infer the results from a sample in relation to a population (Schumacker and Lomax, 2016). Furthermore, distinction is made between the number of variables considered in relation to each other.

- *Univariate analysis* – entails the analysis of the quantities of one variable at a time and only descriptive tests are used for this type of analysis (Tabachnick and Fidell, 2019).
- *Multivariate analysis* – involves investigating relationships between more than two variables and inferences can be drawn from the results (Pallant, 2020)

Standard normal distribution entails a bell-shaped curve which are described by the mean and standard deviation where extreme data values have minimal impact on the mean value (Mishra, Pandey, Singh, Gupta, Sahu and Keshri, 2019). However, there are two ways that distribution may be non-normal, these are skewness and kurtosis. Skewness measures the lack of symmetry and can be positive or negative. While Kurtosis measures peakedness of the distribution (Bell *et al.* 2019). Non-normal data entails extreme values in either measure of skewness and kurtosis (Blanca, Alarcon, Arnua, Bono and Bendayan, 2017; Mishra *et al.* 2019; Orcan, 2020). The results of the Likert scaled items produced some serve distortions, however robust methodologies were used to obtain trustworthy estimates in SEM due to non-normal data. The researcher implemented robust maximum likelihood estimation.

6.6.1.4 Outliers

It is imperative that the researcher scrutinise univariate and multivariate outliers. The responses received characterise the univariate outlier. When responses are extreme on only one variable which can be changed or amended to the next extreme response, depends on the normality of the data (Pallant 2020). Multivariate outliers can occur when there are two or more extreme responses or an uncommon configuration of responses from respondents. This is usually resolved by recoding or removing of multivariate outliers (Kline, 2016). The distribution of multivariate statistics is expected to be normal in SEM. As a result, non-normality affects the correctness of statistical tests which results in a problem with the model. Non-normality distributed data when tested may result in an incorrect model (Hair *et al.* 2018)

Skewness and kurtosis distribution of each observed variable is used to determine univariate normality. Multivariate normality is enhanced, and data increased data normality by deleting or transforming multivariate outliers (Akinyode, 2016; Tabachnick and Fidell, 2019). Any problems of outliers were addressed through robust maximum likelihood as it replaced ordinary sample covariances with robust estimates of covariances.

6.6.1.5 Item Parcelling

Once the structural model is specified, emphasis shifts to the analysis of the path. Noting that three drivers with 19 observed variables and 160 indicator variables, a detailed model fitting would be too vast. As a result, item parcelling was implemented prior to fitting the structural model.

Implementing parcels when specifying models is advantageous as a more parsimonious model as there are fewer parameters that need to be estimated. In addition, the distribution of parcels closely resembles normal distribution in comparison to the original items (Kline, 2016). Therefore, item parcelling is a remedial approach which addresses non-normality (Cain, Zhang and Yuan, 2017). As parcelling depends on the whether the items being combined are unidimensional, this is seen as disadvantageous by (Cain *et al.* 2017). On the advantageous side, statistical problems when conducting multivariate analyses on individual variables can be prevented through parcelling items (Kline, 2016). Parcels have a greater reliability due to their shared variance being pooled which leads to stronger factor loadings and communalities. Item parcelling further reduces model complexity and improves the overall model fit including lower rejection rate results (Hair *et al.* 2018).

According to Kline (2016) it is more efficient to analyse indicators that are categorical items (Likert type scale) rather than individually. Therefore, in this study, due to the variables/ items already being categorised under 19 distinct subscales, these became parcels. As a result, parcelling should be implemented once the complete set has been evaluated and the items comprising parcels are unidimensional (Hair *et al.* 2018, Kline, 2016) In this study, prior to parcelling, exploratory factor analysis was conducted to ensure that the items comprising the parcels were internally consistent and valid (Finch, 2020).

6.6.2 Structural Equation Modelling and Path Modelling

6.6.2.1 Structural Equation Modelling

SEM defined by Schumacker and Lomax (2016) uses various types of models to depict relationships among observed variables with the goal of providing a quantitative test of a theoretical model which is hypothesized by the researcher. SEM allows various theoretical models to be tested that hypothesize how sets of variables define constructs including how these constructs are related (Hair *et al.* 2018).

There are two major variable types, latent and observed variables. Latent variables (not directly observable or measured) are inferred from a set of observed variables that the researcher measures using tests or surveys and in SEM generally correspond to hypothetical constructs (Kline, 2016).

SEM is a multivariate method used to assess the reliability and validity of the model measures. Its aim is to determine the extent to which the theoretical model is supported by sample data (Kline, 2016). If the sample data is supported, then more complex theoretical models may be hypothesized. However, in situations where the theoretical model is not supported by the sample data, the original model can be modified and tested or other theoretical models need to be developed and tested (Hair *et al.* 2018). Theoretical models are tested through SEM using a scientific method of hypothesis testing with the aim of advancing our understanding of complex relationships amongst constructs. Statistical models in SEM are multiple regression analysis, path analysis, factor analysis and analysis of covariance's (Tabachnick and Fidell, 2019)

Path models are specified entirely with observed variables. With flexibility allows multiple independent and dependent observed variables and test more complex models than regression models (Schumacker and Lomax, 2016). Therefore, it can be noted that SEM consists of observed and latent variables whether dependent or independent, where both types of latent variables are measured, inferred or defined through multiple observed or measured indicator variables (Hair *et al.* 2018; Kline, 2016).

Multivariate data analysis entailing EFA, CFA and SEM was conducted for the data analysis in this study.

6.6.2.2 Path Modelling

Path Analysis

Path models require the analysis of several multiple regression equations that use observed variables (Kline, 2016). In addition, path analysis does not entail discovering causes, it tests theoretical relationships known as casual modelling. Furthermore, a path model can establish casual relationships among two variables when, temporal ordering of variables exist, correlation or covariation is present among variables, other causes are controlled and when variable X is manipulated, it causes a change in Y. Path analysis aims to provide quantitative estimates of the casual connections between variables which consist of distinct paths (Hair *et al.* 2018). These are then presented graphically through the use of a path diagram and depicts the potential connections between variables including how the various model constructs relate to each other and estimate the strength of each relationship path. Thereafter, path coefficients are calculated with the aim of providing estimates of each of the postulated paths (Schumacker and Lomax, 2016).

Furthermore, two basic path models exist, (1) recursive models where disturbances are uncorrelated or independent and all casual effects are unidirectional, and (2) non-cursive models which have feedback loops or correlated disturbances and have a greater chance of being problematic due to identification (Hox and Bechger, 1999; Kline, 2016)

There are numerous computer software packages that can be utilised to analyse path/ SEM models, Some key software packages these include, Linear Structural RELationships (LISREL), Structural Equation Modelling and Path Analysis (SEPATH), Analysis of Moment Structure (AMOS), Mplus, and Statistical Package for the Social Sciences (SPSS Amos) (Hair *et al.* 2018; Kline, 2016; Tabachnick and Fidell, 2019). SPSS Amos was selected for the following reasons:

- It is a powerful SEM software that supports research theories by extending standard multivariate analysis methods,
- It can estimate SEM and path models with single or multiple groups,
- In addition, it can analyse a combination of continuous, dichotomous, ordinal or count variables and has rapid computational speed,
- Furthermore, it handles common forms of incomplete data including item parcelling and has the ability to recode variables within the context of the model script (Kline, 2016; MacDonald and Headman, 2009)

Path Modelling Process

While Schumacker and Lomax (2016) highlights five steps through which path models and structural models can be conducted, these are specification, identification, estimation, testing and modification. The steps followed in this study were:

1. *Model Specification* – this is derived from the literature review after which the theoretical model has a substantive research basis. The specification of the model involves two components, (1) confirming which variables are included in the model and those excluded, and (2) how the variables relate to one another. Only variables most important for the research need to be considered in which the relations between the variables is based on the research and theory.
2. *Model Identification* – involves statistical models respecting certain rules and restrictions one of which is identification. A model is identifiable, provided that it is theoretically possible for the computer to derive for every model parameter, a unique estimate. If the model does not hold, it is not identifiable.
3. *Model Estimation* – the process of utilising an SEM computer-based tool/ programme to conduct the analysis. This step involves (1) model fit is evaluated which entails determining how well the model will explain the data, (2) interpret the parameter estimates and (3) take into consideration equivalent or near equivalent models.

4. *Model Testing* – this step entails confirming how well the sample data fits the theoretical model to be tested. Here, global fit indices are useful to assess the fit of the entire model. It is recommended that the researcher report multiple fit indices and thereafter implement a vote count to which they suggest an acceptable model. There are three categories to measure goodness-of-fit, absolute, comparative/ incremental and parsimonious (predictive/ informative fit indices). Kline (2016) and Hair *et al.* (2018) note that using a combination of fit indices to allow the overall data fit to be interpreted and further recommends the use of at least one measurement from each category. It is noted by Schumacker and Lomax (2016) that it is unnecessary and unrealistic to include every index in a study, as a result, only the key indices, absolute fit are discussed. Absolute fit indices were applicable to this study. Absolute fit indices involve measuring the overall model fit of the measurement and structural models independently with the aim of determining how well the model fits the sample data (Hair *et al.* 2018). Measures of absolute fit include the chi-square statistic, the goodness-of-fit statistic, the root mean square error of approximation and the standardised root mean square residual (Tabachnick and Fidell, 2019)

6.7 Reliability and Validity

6.7.1 Reliability

Reliability makes reference to the consistency of results obtained in the research such as the reliability of the method collecting research (McNeill, 1990). The questionnaire may be valid, but it also needs to be reliable. The researcher ensures that the question is reliable by ensuring internal validity was met. As a result, reliability is associated with the robustness of the questionnaire, specifically whether there will be consistency in the findings at different times under different conditions (Saunders *et al.* 2019).

The Delphi study was used to enhance the reliability of the survey questionnaire. Thereafter, internal consistency was implemented for reliability testing which involved correlating responses to each question in the questionnaire with other questions in the questionnaire which measures the consistency of responses across all or sub-groups of questions from the questionnaire. Cronbach's alpha was used to calculate internal consistency (Kothari, 2020; Saunders *et al.* 2019).

6.7.2 Validity

Validity refers to whether identified inputs within their attributes will actually produce the expected output including the extent to which the findings of any research can be generalised or extrapolated beyond the research sample and setting in which the research was executed from. This entails the results possess both internal validity (extent that cause, and effect are supported by the study) and external validity (extent that findings can be generalised) (Walliman, 2017).

According to Saunders *et al.* (2019) further supported by Kothari (2020), validity in respect of the questionnaire administered refers to the ability of the questionnaire to measure what it was intended to measure. However, validity can only be determined by seeking evidence that confirms the answers obtained with the measuring tool (questionnaire). This study ensured face, content and construct validity were achieved.

Face validity – was implemented through in-depth review of the literature, competency and representativeness of samples including competency of data processing ensuring correct data analysis and appropriate interpretation and justifiable conclusions. Furthermore, the validity of the Delphi process and national survey questionnaire was reinforced by ensuring there was no bias and anonymity and confidentiality of information.

Content validity – was implemented through an in-depth literature review in order to identify the drivers and items that the subscales are made up of, including the Delphi study which enabled experts in the field to add or remove items from the subscale. A pilot study for the Delphi further reinforced its content validity.

Construct validity – was measured through convergent and discriminant validity. Convergent validity was tested through utilising correlation coefficients, standardised factor loadings, explanatory factor analysis and confirmatory factor analysis. Finally, discriminant validity was analysed through implementing correlations, explanatory factor analysis and confirmatory factor analysis.

6.8 Ethical Considerations

Professions are guided by a code of ethics. The way a profession serves society continuously changes in accordance with society's needs and expectations including the technology available for the profession to deliver the service. As a result, ethical codes governing the manner in which the services are delivered need to adapt and also change (Kumar, 2019; Kothari, 2020). Therefore, research ethics relates to questions of how the research topic was formulated and clarified, design the research and gain access, collect and process data including storage as well as the write up of the research findings in a moral and responsible manner (Saunders *et al.* 2019)

Ethical considerations of research concern the level of appropriateness of the researcher behaviours in relation to the rights of the subjects of the research affected by the research (Saunders *et al.* 2019). It is considered an essential component in demonstrating the credibility of the research findings. Ethical issues of consideration and evaluation at the outset provided through evidence and in-depth discussion

of the research proposal are considered the main criteria for the research project to proceed (Cooper and Schindler, 2009)

This study ensured that careful attention and consideration was given to ethical issues. It is key to note that if researchers are not viewed as trustworthy then the validity of data collected will not be a true reflection respondents' intent. It was reinforced via email that all questionnaire respondents private and confidential information through the research will be treated with the strictest confidence. An informed consent letter was signed by participants ensuring that they understood the research being carried out including how the results will be implemented in order to allow them to make a choice on participation. In addition, ethical clearance was obtained through the University of KwaZulu-Natal research office (ethical clearance letter attached in Appendix A).

Participation in this study involved minimal risk as only time lost for completing the survey, any pressure experienced to complete the survey on time any potential stress incurred over not understanding the questionnaire. Furthermore, various measures were implemented towards ensuring risk was reduced and managed which included a structured and comprehensive study design, the informed consent letter and participant confidentiality and anonymity. As a result, this study thoroughly covered all ethical issues.

6.9 Summary

This chapter provided an insightful view on the structure and design of the methodology designed to achieve the research aim and objectives. The chapter discussed the research process and approach as well as the research methodology and methods. In addition, the data collection and sampling methodology used was then presented. Furthermore, the chapter discussed the data analysis and drew to a close with the credibility, reliability and validity of the research findings including ethical considerations being presented.

CHAPTER 7 – DELPHI STUDY

7.1 Introduction

This chapter presents the Delphi method implemented in the research. It highlights the theoretical background, advantages and disadvantages including the characteristics of the Delphi method. In addition, the chapter covers its limitations and application. Furthermore, the application of the Delphi approach in public sector construction projects is also discussed.

7.2 The Delphi Technique

The Delphi technique was developed by Norman Dalkey of the RAND Corporation in the 1950's for implementation in the military for eliciting and refining group judgements and adopts the name from the Delphi oracle from Greek mythology (Avella 2016; deBoer and Hale 2002; Linstone and Turoff, 2002). The Delphi method uses a process of iteration to collect and distil judgments of experts through utilising a series of questionnaires interspersed with feedback (Grime and Wright, 2016). The questions are designed based on the problems, solutions, opportunities or forecasts identified in literature of the study (Dodohoe, Stellefson and Tenant, 2012). Each questionnaire is developed from the questionnaire of the previous round and the process implemented through controlled feedback ends when consensus is achieved (Skinner, Nelson, Chin and Land, 2015; Skulmosi, Hartman & Krahn, 2007; Yang, Zeng and Zhang, 2012)

According to Linstone and Turloff, (2002) the Delphi method exhibits flexibility in its use through structuring group communication in order to facilitate problem solving and to structure models. Furthermore, Skulmosi *et al.* (2007) supports this argument by noting that the Delphi method is mature and adaptable in various research areas across the globe.

Advantages of a Delphi study include:

- Achievement of consensus in areas of uncertainty or those lacking causation (Fink-Hafner, Dagen, Dousak, Novak and Hafner-Fink, 2019),
- Communication amongst experts through the assistance of the researcher, enabling freedom of expression without confrontation and group pressures (Donohoe and Needham, 2009),
- Anonymity of participants (Hsu and Ford, 2007),
- Allows knowledge areas of agreements and disagreements to be linked together (Iqbal and Pippon-Young, 2009),
- Opportunity for feedback (Wynaden, Heslop, Omani, Nelson, Osmond, Taylor and Gee, 2014),
- Participants are of a high standard (Revira, 2013),

- Simple to design and flexible in adapting the technique to various situations and problems (Bleijenbergh, Korzilius and Verschuren, 2011), and
- Communication with participants is free from geographical constraints (Gjoligaj, 2015; Powell, 2003).

Disadvantages of a Delphi study

- Design flaws in the design can appear from shortcoming of the researcher or from participants (Avella, 2016; Donohoe and Needham, 2009),
- The process can be time consuming and demanding which requires commitment from participants (Fink-Hafner *et al.* 2019; Schmidt, Lyytinen, Keil and Cule, 2001),
- Additional questions cannot be added once the study commences (de Villiers, de Villiers and Kent, 2005; Hsu and Ford, 2007),
- Anonymity may suppress the ownership of ideas (Linstone and Turloff, 2002), and
- The participant selection is open to potential bias including misinterpretation of the data (Iqbal and Pippon Young, 2009; Vernon, 2009;).

In order to avoid inadequate application of the Delphi technique, this study ensured that the advantages were adequately implemented.

7.3 Steps in a Delphi Study

The steps in a Delphi study generally entail selecting a panel of experts from a list of predefined guidelines (Iqbal and Pippon Young, 2009; Linstone and Turloff, 2002). Thereafter, the panel of experts are requested to participate in two to three rounds of surveys where anonymous feedback is provided after each round and expert panellists are able to revise their previous response with the aim of achieving consensus (Donohoe, Stellefson and Tennant, 2012; Von der Gracht, 2012). Figure 7.1 exemplifies the steps for conducting a three round Delphi study:

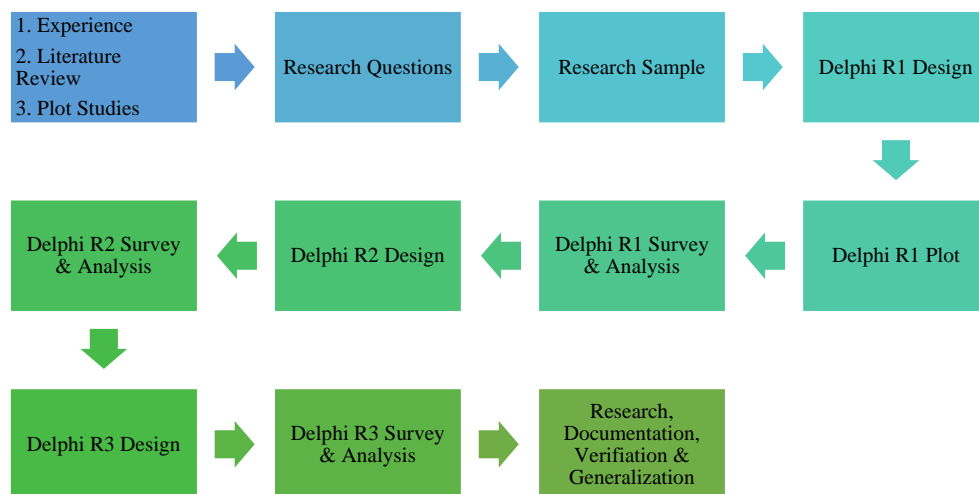


Figure 7.1: Three Round Delphi Process (Adapted from Skulmosi *et al.* 2007:3)

7.3.1 The Research Question

The research question was formulated through an extensive and in-depth literature review. The Delphi survey was carried out to answer the following clear and feasible research question:

What are the drivers that will signify the development of a model to assist the South African government effectively implement the FIDPM towards improved service delivery?

In the development of the questionnaire, the research question was divided into two parts based on importance and impact:

1. How important are the key drivers for the public sector, government policies, frameworks and the FIDPM and, PM tools and techniques for improving public service delivery?
2. What is the impact of the key drivers for the public sector, government policies, frameworks and the FIDPM and, PM tools and techniques for improving public service delivery?

7.3.2 The Research Design

This step involved a review of different research methods including qualitative, quantitative and mixed methods. The research method implemented for this study was a quantitative technique as discussed in the research methodology chapter.

7.3.3 The Research Sample

The panel size for Delphi studies are generally small and usually do not generate any statistically significant results as experts are selected non-randomly (Donohoe *et al.* 2012; Hsu and Ford, 2007; Lilja *et al.* 2011). In addition, the findings of one panel are not intended to be generalised to a different panel or larger sample (Iqbal and Pippon Young, 2009; Skulmosi *et al.* 2007; Skinner *et al.* 2015). However, Loo and Thorpe (2002) notes that small panel sizes can be used as the selection of experts is important towards a successful Delphi study. Furthermore, Taylor-Powell and Renner (2003) highlight two key aspects for consideration in a Delphi study, the qualifications of experts and the panel size.

7.3.3.1 The Qualifications of Experts

A successful Delphi study requires the creation of an expert panel of individuals comprising a combination of subject experts who are knowledgeable about a specific topic (Linstone and Turoff, 2002; Skinner *et al.* 2015; Yousuf, 2007). The panel of experts for this study was identified using purposive sampling as the intent was to utilise a heterogeneous sample so that diverse opinions and viewpoints could be obtained (Dooley, 2007). This is supported by Lilja *et al.* (2011), Linstone and Turoff, (2002) who emphasise that heterogeneous panels are best suited to produce higher quality results due to their vast knowledge base.

In order to identify the expert panellists, Avella (2016) and Dooley, (2007) note that minimum qualifications must be defined in relation to the research topic as participants need to be recognised and validated as experts within their domain. As a result, the selection of potential experts was executed using the following selected set of criteria. The expert panellists are all required to fulfil the first three criteria and any one or both of the last two criteria:

1. Professionally Registered with SACPCMP,
2. Built Environment Qualification,
3. Knowledge and Experience with Government Policies and Frameworks,
4. Knowledge and Experience with Public Procurement and Supply Chain Management, and
5. More than ten years of experience in Public Sector Construction Projects.

Thereafter, the identified experts were individually emailed and notified about the study via a request to participate and were assured of their anonymity and confidentiality (refer Appendix B for Delphi invitation letter). Once accepted, the participants were requested to produce their curriculum vitae in order to verify that they have met the requirements from the listed criteria.

7.3.3.2 The Panel Size

There are numerous viewpoints from various authors regarding what the size of a panel should be. Skinner *et al.* (2015) highlight that the aim is to include experts with the greatest knowledge and experience in the area of research under review, therefore, the panel size is usually small. While there is no set standard for the number of participants, Avella (2016) notes that panels consisting of less than 10 and more than 1000 are not common with panels between 10 and 100 being most common. In addition, Dalkey (2002) highlights panels with at least 13 experts are required to achieve reliability (a rating of 0.9 on the Likert scale).

However, under typical research circumstances panels are usually found to be between 10 and 30 experts (Baldwin and Trinkle, 2011; Daniel and White, 2005; De Haes and Van Grembergen, 2009; Worrell, Di Gangi, and Bush, 2013). Although the size of the panel is subject to variance, Avella (2016) highlights it is ultimately dependent of the design of the research and Baldwin and Trinkle (2011) further emphasises that using too many panellists in the data analysis can be formidable and cautions against it. Martino (1985) emphasises that is unlikely another group of experts will produce substantially different results from a panel of 15 experts.

Prior to the questionnaire being emailed, 16 participants were issued an invitation letter informing them of the proposed study, requesting their participation to be included in the panel and outlining what was required. Sixteen qualified experts accepted the invitation to participate. However, two experts (12.5%)

did not respond after the first round of questionnaires were emailed. Figure 7.2 depicts the Delphi panellists sampling and response rate for each round.

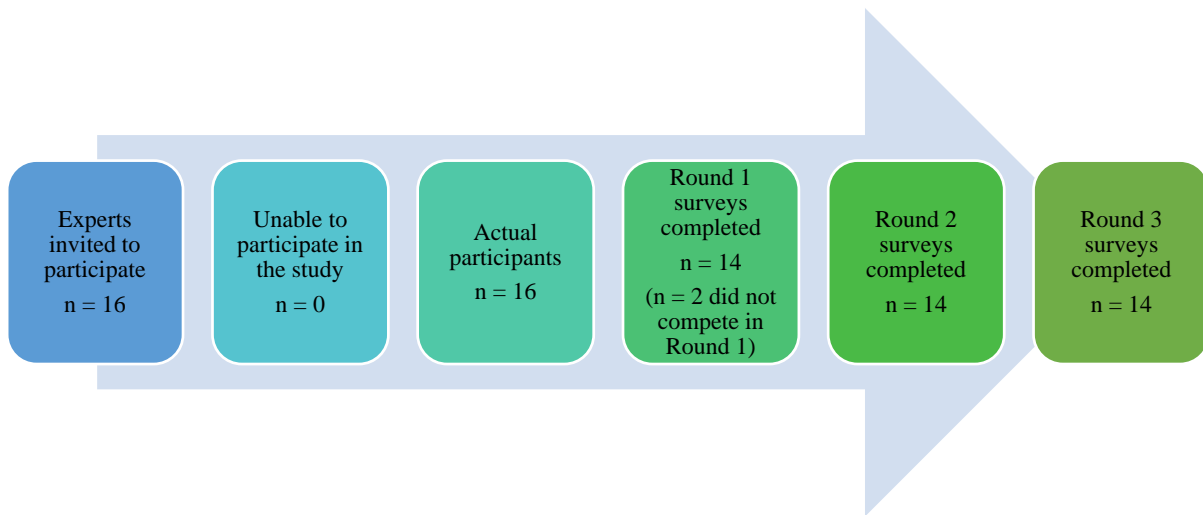


Figure 7.2: Delphi panel sampling and response rate.

7.3.3.3 The Number of Rounds

The Delphi method varies from other surveys as it is executed through iteration eliciting panellists' feedback about the topic through a series of rounds (Geist, 2010; Lilja *et al.* 2011; Von der Gracht, 2012). Two rounds are considered a minimum (Bradley & Stewart, 2003) and between three and six rounds are considered sufficient for realistic findings (Custer *et al.* 1999). While Lang (1994) suggests that up to 10 rounds may be necessary for achieving consensus. However, Rowe and Wright (2001) and Hallowell and Gambatese (2010) regard three iterations as sufficient.

A heterogeneous sample requires three or more rounds whereas homogenous samples require less than three rounds (Skulmoski *et al.* 2007). In addition, panel fatigue and attrition should be prevented through fewer iterations as possible (Geist, 2010; Lindestone and Turoff, 2002). Furthermore, Hallowell and Gambatese (2010) emphasise the main intent of multiple iterations is to reach consensus and improve precision.

7.3.3.4 Attaining Consensus

It is difficult to determine the appropriate measure of consensus as there are no defined rules for when it is achieved (Fink-Hafner *et al.* 2019; Hallowell and Gambatese, 2010). However, when feedback converges, it is considered the final round (Conner, Roberts and Harder, 2013; Harder, Place and Scheer, 2010; Shinn, Wingenbach, Briers, Lindner and Baker, 2009).

Holey *et al.* (2007) highlights that consensus means agreement which is determined by: (1) the aggregate of judgements (which occur within each Delphi round), (2) a move to a subjective level of central tendency and (3) by confirming stability in the responses through the consistency of answers (both (2) and (3) which occur between rounds). Frequency distribution can also be used to assess consensus. McKenna (1994) suggests that the criterion of 51% responding to a response category can be used to determine agreement. In addition, Holey *et al.* (2007) use percentage responses to determine consensus while Rayens and Hahn (2000) use means and standard deviations.

According to Vernon (2009) and Fink-Hafner *et al.* (2019) consensus does not always mean a 100% agreement and it is difficult to get groups of experts, each with varying viewpoints and opinions to reach agreement. As a result, consensus can range from 55 to 100% agreement with 70% considered the standard. The Likert scale was used to measure importance and impact. Giannarou and Zervas (2014) suggested that a 10-point scale be used when the level of importance or impact is investigated. Therefore, this study adopted the 10-point Likert for importance and impact.

In this study, two criteria were adopted to attain consensus and to identify the key drivers for the public sector, the FIDPM and project management tools and techniques for improving public service delivery that would be incorporated in developing the conceptual model for assessment design:

1. *Importance scale* – the median should be 8 and above and at least 50% of the expert panellists should rate the element from 8 to 10.
2. *Impact scale* – the median should be 8 and above and at least 50% of the expert panellists should rate the element from 8 to 10.

The implementation of the FIDPM in public sector construction projects is relatively new in its application. However, based on the critical role this framework plays in facilitating public service delivery, the criteria adhered to for attaining consensus was strict as the researcher ensured that borderline influences were not entertained.

7.3.4 Delphi Round One Questionnaire Design

The Delphi invitation letter (attached Appendix B) including the quantitative structured questionnaire designed which was based on the literature was used for the first round (Appendix B).

The questionnaire was extensively designed and created to enable participants to effortlessly understand and complete the questions within 25 minutes. The questionnaire entailed three drivers, the public sector, the FIDPM and project management tools and techniques with a total of 19 factors and 194 sub-factors that were identified through the literature review and refined after the Delphi pilot study. The content of the questionnaire including the drivers were clearly explained on the cover letter. Thereafter,

participants were required to rate the 194 sub-factors according to a 10-point Likert importance scale where 1 = not important and 10 = very important and on a 10-point Likert impact scale where 1 = no impact and 10 = very high impact as depicted in Table 7.1.

Table 7.1 Importance and Impact Scale

Rating – Importance Scale									
Not Important		Fairly Important		Neutral		Important		Very Important	
0-10%	11-20%	21-30%	31-40%	41-50%	51-60%	61-70%	71-80%	81-90%	91-100%
1	2	3	4	5	6	7	8	9	10
Rating – Impact Scale									
No Impact		Slight Impact		Neutral		High Impact		Very High Impact	
1	2	3	4	5	6	7	8	9	10

The Delphi was then conducted in three rounds as per Figure 7.3.

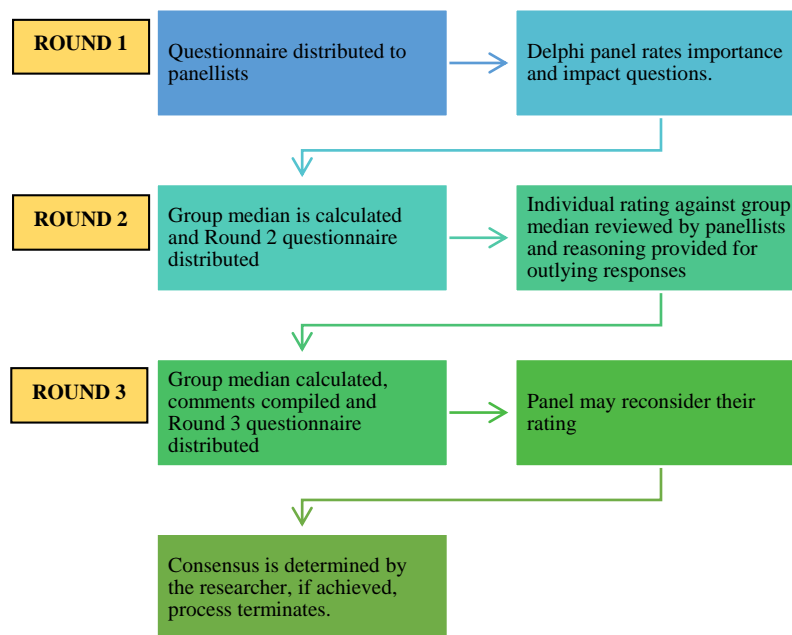


Figure 7.3: Delphi Rounds

7.3.5 Delphi Pilot Study

A pilot study was implemented as discussed in chapter 6 (cf. par. 6.5.1) prior to the questionnaires being emailed. The purpose of the pilot study was to ensure that the instructions for the questionnaire were concise, clear and easy to interpret including whether participants understood their role including the removal of ambiguities and to determine the duration for completion. The pilot study was conducted with three built environment professionals. Thereafter the time for completing the questionnaire was measured and the questionnaire refined.

7.3.6 Round One Questionnaire Survey and Analysis

The first round of questionnaires was emailed to 16 expert panellists that agreed to participate in March 2021. Fourteen expert panellists completed and returned the questionnaire which according to Iqbal and Pison-Young (2007) and Sumsion (1998) represents an acceptable response rate. No reasons were provided by the two participants that did not respond. Expert panellists were issued with a reminder email within a week of the questionnaire being circulated and the responses received were analysed using Microsoft Excel and the median of the response for each sub-factor computed.

7.3.7 Delphi Round Two Questionnaire Design

Round two of the Delphi involved updating the questionnaire instructions and issuing the adapted version of the questionnaire to expert panellists. The round two questionnaire presented the group median, and the participants score from round one. Through ensuring anonymity the expert panellists were individually emailed so that they could respond to the second questionnaire with knowledge of the group median and their own previous response only. Thereafter, expert panellists were required to address one of the following actions in round two, (1) retain their round one response, (2) align their round one response to the group median or (3) provide a new response. Furthermore, this round enabled expert panellists to provide justification to their responses if it fell one unit on either side of the median.

7.3.8 Round Two Questionnaire Survey and Analysis

The revised questionnaire with the group median was emailed to 14 expert panellists at the end of March 2021 with a reminder email following a week later. The expert panellists were very responsive and displayed keenness for the questionnaire topic. As a result, all 14 participants returned their questionnaires. The responses received in round two were analysed using Microsoft Excel 365 and the median of the response for each sub-factor computed. Consensus was clearly noticeable after round two.

7.3.9 Delphi Round Three Questionnaire Design

Controlled feedback through the responses in round two enabled the questionnaire for round three to be developed. In round three, the questionnaire distributed to expert panellists incorporated the group median from round two including reasons for different opinions. Thereafter, expert panellists could retain their response from round two, change their response to align with the group median or generate a new response. Expert panellists were also advised to consider comments on outlining responses.

7.3.10 Round Three Questionnaire Survey and Analysis

The round three questionnaire was issued in April 2021 which was completed and returned by 14 expert panellists. This round involved utilising the criteria for obtaining consensus to analyse the results. Based

on the results of the third round, it was clear that there was no need for a fourth round as no further value would be added to the degree of consensus already attained.

7.3.11 Verification, Analysis and Reporting the Research Results

This step entailed confirming consensus of the survey and terminating the process. In addition, the results involved continuous verification throughout Delphi process via reliability and validity including minimising bias.

7.3.11.1 Reliability and Validity of the Delphi Method

Consideration must be given to reliability and validity when undertaking a research study as they are both critically important towards estimating adequacy and accuracy procedures. Reliability involves the extent of which measures are repeatable when performed by different people on different occasion under different conditions with alternate instruments to measure the construct (Drost, 2011). While validity is the extent a measure adequately represents the construct, it is intended to measure (Baija and Baija, 2014). As highlighted by Goodman (1987) the researcher ensured reliability and validity was implemented through the following:

- Construct validity was ensured through the attentive design of the pilot study;
- The panel size was adequate according to literature;
- Panellists selected were knowledgeable and showed interest in the field of study;
- Minimum selection criteria for panellists were verified through review of the curriculum vitae;
- Strengthening decisions through reasoned arguments with expert panellists where assumptions are challenged;
- Ensuring a good response rate from a heterogeneous panel of experts;
- A sound communication plan was adopted to ensure timeous responses with expert panellists to address queries and clarification were required;
- Ensuring consensus was achieved through implementing successive rounds of the questionnaire to participants;
- There is an audit trail documenting the process;
- Anonymity of the expert panellists ensured reliability while allowing them to discuss, comment and compare their own knowledge, expertise and answers to those of others.

7.3.11.2 Minimising the Effects of Bias

According to Heath and Tindale (1994) it is important to ensure that bias is minimised in a defensible research study as the purpose of reducing bias is to ensure cognitive shortcuts which distort the true intent of opinions do not lead to further inaccuracies in judgement. As a result, the success of the Delphi

process is dependent on the expert panellists unbiased judgement. Hallowell and Gambatese (2010) identify the prominent biases that may occur in construction related studies and in a Delphi study, the bias were:

- *Collective unconscious* – involves decision makers joining a popular trend and is also referred to as the “bandwagon effect”. Occurs when social forces compel a participant to conform (Hallowell, 2008).
- *Contrast effect* – occurs when a given subjects perception is enhanced or diminished by the immediately preceding subjects value. An individual’s evaluation of the criterion can be influenced by exposure to a previous high or low value (Bjarnason and Jonsson, 2005).
- *Von Restorff Effect* – when panellists are more likely to remember events linked to severe outcomes which distorts the perception of probability. An individual recognises an extreme event over a less extreme event (Rottenstreich and Hsee, 2001).
- *Myside Bias* – arguments are generated only on one side of an issue by individuals (Martin, 2006).
- *Dominance* – occurs when a dominant, vocal or intimidating participant influences control over the ratings of other group members (Baron, 2003).

Bias in the study was reduced through the researcher implementing the following:

- The Delphi questionnaire was designed to minimise contrast effects;
- Reasons were provided for different views and opinions in feedback reducing myside, von Restorff and collective unconscious bias;
- The Delphi process involved multiple iterations which reduced von Restorff and dominance bias;
- Expert panellists were anonymous to each other which reduced von Restorff and dominance bias;
- Medians were reported on as these were less likely to be impacted by outlying responses, reducing von Restorff, recency, primary and contrast bias.

7.4 Summary

The Delphi study was implemented to ensure that a systematic approach was provided towards achieving consensus on the three drivers for improving service delivery. In addition, an expert panel responded to three rounds of questionnaires with the aim of achieving consensus.

CHAPTER 8 – RESULTS OF THE DELPHI STUDY

8.1 Introduction

This chapter presents the Delphi survey conducted in this study and discusses the analysis of demographic information of the experts including a descriptive statistical analysis of the three Delphi rounds implemented.

8.2 Demographic and Geographic Information of Delphi Panellists

Non-probabilistic purposive sampling was used to identify a heterogenous group of sixteen individuals to serve as experts in the Delphi survey so that diverse opinions could be obtained. Letters of invitation were sent to the experts and all 16 experts accepted the invitation. However, only 14 experts participated in all three rounds which represented a panel of 86% males and 14% females. The experts were from three provinces located within South Africa, namely, KwaZulu-Natal (8 experts), Gauteng (4 experts) and Western Cape (2 experts). The difference in the geographical location of the experts assists with preventing bias in the results and fosters anonymity in the process.

All experts met the selection criteria set for participation in the survey as indicated in Table 8.1. Each of the experts has a minimum of 10 years' experience in public sector construction projects and their cumulative work experience was more than 339 years. In addition, Expert panelists were requested to submit a curriculum vitae detailing their level of knowledge and experience which was reviewed and verified by the researcher. As a result, it was confirmed that all experts have extensive knowledge and experience with government policies and frameworks including public sector procurement and supply chain management.

Table 8.1: Professional Background and Experience of Delphi Panel of Experts

No.	Selection Criteria Variables	Number of Participants
1	Professionally Registered with SACPCMP	14
2	Built Environment Qualification	14
3	Knowledge and Experience with Government Policies and Frameworks	14
4	Knowledge and Experience with Public Procurement and Supply Chain Management	14
5	Years of experience in Public Sector Construction Projects	
	• 10 – 20	3
	• 21 – 30	8
	• Greater than 30	3
	Total	14

8.3 Results of the Delphi Study

The Delphi survey was carried out to answer the following research question:

What are the drivers that will signify the development of a model to assist the South African government effectively implement the FIDPM towards improved service delivery?

In the development of the questionnaire, the research question was divided into two parts based on importance and impact:

1. How important are the key drivers for the public sector, government policies, frameworks and the FIDPM and, PM tools and techniques for improving public service delivery?
2. What is the impact of the key drivers for the public sector, government policies, frameworks and the FIDPM and, PM tools and techniques for improving public service delivery?

The survey design of the Delphi questionnaire developed for this study is presented in Appendix B. The results obtained from the three rounds of the Delphi survey are presented next.

8.3.1 Round One

In the first round, each of the experts were asked categories of questions grouped under three drivers comprising 19 unobserved variables and 192 sub-factors that influence the assessment design. These factors were to be rated using a 10-point Likert scale. The sample of the first-round questionnaire is presented in Appendix B. The public sector entailed 48 sub-factors grouped under seven unobserved variables. The government policies, frameworks and the FIDPM included 49 sub-factors which were grouped under five unobserved variables and, the PM tools and techniques comprised 95 sub-factors grouped under seven unobserved variables. The drivers, unobserved variables and sub-factors are illustrated in Figure 8.1 and Table 8.2:

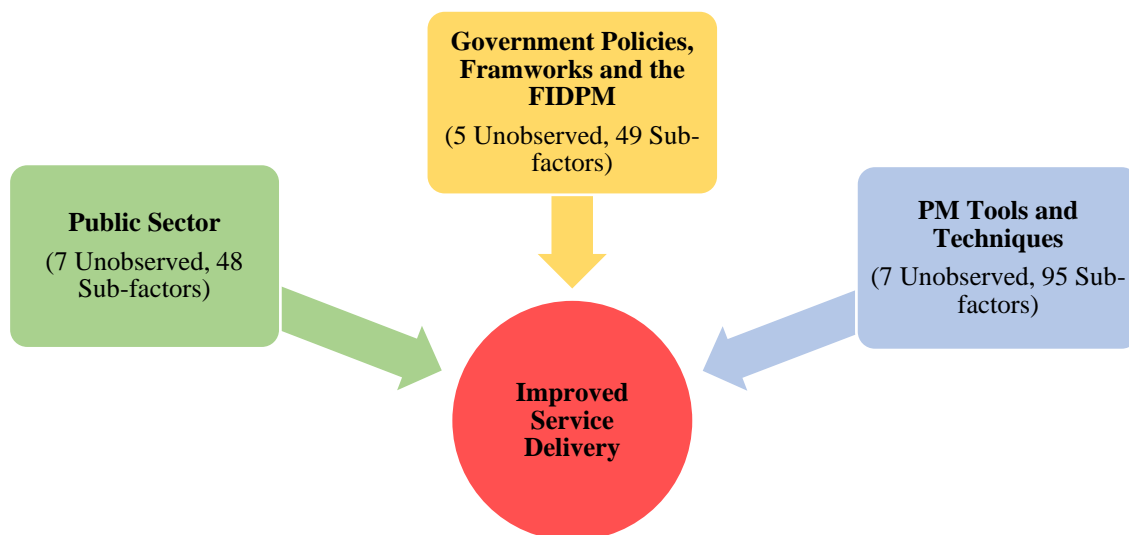


Figure 8.1. Drivers that influence service delivery

Table 8.2: Drivers and Factors for the Study

Drivers		Unobserved Variables & Sub-Factors		
1	Public Sector	1	Recurring Problems in the Public Sector	48No. Sub-factors
		2	Public Service Transformation Strategies	
		3	Government Initiatives	
		4	Batho Pele Principles	
		5	Service Delivery Challenges	
		6	Government Processes and Decision Making	
		7	Management Strategies for Service Delivery	
2	Government Policies, Frameworks and the FIDPM	1	Policy Development and Implementation	49No. Sub-factors
		2	Effective Policy Implementation	
		3	SCM Public Procurement Challenges	
		4	IDMS, SIPDM & FIDPM	
		5	Government Ability to Apply the FIDPM	
3	PM Tools and Techniques	1	PM Attributes	95No. Sub-factors
		2	Effective Ways of Introducing Change	
		3	Skill Sets of Effective PM's	
		4	Ten Areas of Expertise and Service Delivery Challenges	
		5	Key Institutional Goals	
		6	Application of IDM Toolkits Principles and Benefits by PM's	
		7	Implementation of IDM Toolkits Principles and Benefits in FIDPM Work Stages	

The rating was done based on their importance and impact on the key drivers for the public sector, government policies, frameworks and the FIDPM and, PM tools and techniques for improving public service delivery. The first-round questionnaire was emailed to 16 experts and only 14 experts (87.5%) responded. Tables 8.3 – 8.5 presents the first-round summary of responses. The responses from the first-round survey were analysed to determine the statistical median including the percentage of respondents who rated each factor/ influence with 8 and above on a 10-point Likert scale.

In this study, two criteria were adopted to attain consensus and to identify the key drivers for the public sector, government policies, frameworks and the FIDPM and, PM tools and techniques for improving public service delivery that would be incorporated in developing the conceptual model for assessment design:

1. *Importance scale* – the median should be 8 and above and at least 50% of the expert panellists should rate the element from 8 to 10.
2. *Impact scale* – the median should be 8 and above and at least 50% of the expert panellists should rate the element from 8 to 10.

Table 8.3: Delphi Results Round 1 – The Public Sector

DELPHI STUDY - ROUND 1		Importance		Impact	
		Median	% Response (8-10)	Median	% Response (8-10)
Section 1: The Public Sector					
No.	Recurring Problems in the Public Sector				
1	Consistent recurrence of findings.	9.0	100.0	9.0	92.0
2	Resource optimisation, accountability and a non-compliance culture seem to be the main problem areas in the public sector.	9.0	100.0	9.0	100.0
3	The root causes of problems are not being adequately addressed.	9.0	100.0	9.0	100.0
No.	Public Service Transformation Strategies				
1	Generate mission statements for service delivery linked to service guarantees	9.0	100.0	9.0	100.0
2	Identify services and target populations for services emphasising affordability	9.0	100.0	9.0	100.0
3	Set definite service standards, define outputs and targets and determine performance	9.5	100.0	9.0	100.0
4	Manage service delivery by means of sound human and financial resource management	9.0	100.0	9.5	100.0
5	Develop a culture of customer care and context and client sensitive service delivery	9.0	100.0	9.0	100.0
No.	Government Initiatives				
1	Suitable infrastructure and logistics.	9.5	100.0	9.5	100.0
2	Competitive input prices.	9.0	100.0	9.0	92.0
3	Skills and technology.	9.5	100.0	9.5	100.0
4	Innovation and partnerships.	9.0	100.0	9.0	92.0
5	Efficient regulation.	9.5	100.0	9.5	100.0
6	Effective government offerings.	9.0	85.0	9.0	78.0
7	Equitability.	9.5	92.0	9.5	100.0
8	Accountability.	10.0	100.0	10.0	100.0
9	Improving Performance Management.	9.5	100.0	9.5	100.0
No.	Batho Pele Principles				
1	Consultation – citizens should be consulted about their needs.	9.5	100.0	9.5	100.0
2	Standards – all citizens should know what service to expect.	9.5	100.0	9.5	100.0
3	Redress – all citizens should be offered an apology and solution when standards are not met.	8.5	100.0	8.5	76.0
4	Access – all citizens should have equal access to services.	9.0	100.0	9.0	85.0
5	Courtesy – all citizens should be treated courteously.	10.0	100.0	10.0	100.0
6	Information – all citizens are entitled to full, accurate information.	10.0	100.0	10.0	100.0
7	Openness and Transparency	9.5	100.0	9.5	85.0
8	Value for Money – all services provided should offer value for money.	10.0	100.0	10.0	100.0
No.	Service Delivery Challenges				
1	Political issues.	9.5	100.0	9.5	100.0
2	Policy issues.	9.5	100.0	9.5	100.0
3	Implementation issues.	9.5	100.0	9.5	100.0
4	Prolonged procurement, ultimately delaying construction.	9.5	100.0	9.5	100.0
5	Acute problems of institutional capacity.	9.5	100.0	9.5	100.0
6	Mismanagement of funds.	9.0	100.0	10.0	100.0
7	High levels of corruption.	9.0	100.0	10.0	100.0
8	A lack of public participation.	9.5	100.0	9.5	100.0
9	Absence of people centred culture and lack of objectives in the public service.	9.5	100.0	9.5	100.0
10	Training and development programs not being underpinned by people first values.	9.0	100.0	9.0	100.0
11	Lack of effective monitoring and evaluation mechanisms internally and externally.	9.0	100.0	9.0	100.0
12	Strategic planning activities on service delivery are limited to senior management.	9.5	100.0	9.5	100.0
13	Poor site management from public servants.	9.5	100.0	9.0	100.0
14	Time and cost variations.	9.0	100.0	9.5	100.0
15	Skills and competency issues.	9.5	100.0	9.5	100.0
No.	Government Processes and Decision Making				
1	Detailed regulation and central prescription has resulted in excessive bureaucracy and lengthy procedures	10.0	100.0	10.0	100.0
2	Service deliverers are currently forced to spend too much of their time trying to get decisions made and complying with central requirements	10.0	100.0	9.5	100.0

3	Implementing robust risk assessments and management processes at project inception to drive the decision-making process in procurement on public sector projects.	9.5	100.0	9.5	100.0
No.	Management Strategies for Service Delivery				
1	Development of more flexible regulatory frameworks.	9.0	100.0	9.0	100.0
2	Improvement of human resource management systems.	9.0	100.0	9.0	100.0
3	Development of more results-oriented management systems.	9.5	100.0	9.5	100.0
4	*Decentralisation and delegation of management responsibility.	7.0	21.0	7.0	28.0
5	*Systematic sharing of good practice.	7.0	28.0	7.0	28.0

Table 8.4: Delphi Results Round 1 – Government Policies, Frameworks and the FIDPM

DELPHI STUDY - ROUND 1		Importance		Impact	
		Median	% Response (8-10)	Median	% Response (8-10)
Section 2: Government Policies, Frameworks and the FIDPM					
No.	Policy Development and Implementation				
1	Current policy development deals with their targeted areas of concern regarding improving public service delivery.	9.5	100.0	10.0	100.0
2	Government is good at policy development and are successful at implementing policy.	10.0	100.0	9.5	100.0
3	The infrastructure delivery model requires a new trajectory in tackling the under-development and triple challenges of poverty, unemployment and slow economic growth.	10.0	100.0	10.0	100.0
No.	Effective Policy Implementation				
1	Departments not having service standards.	9.0	100.0	9.0	100.0
2	*Service standards were poorly defined, thus making them difficult to measure.	6.0	7.0	6.5	7.0
3	*Considerable confusion exists between service standards and service delivery indicators.	6.0	0.0	6.5	0.0
4	Service standards not readily available to internal or external clients and therefore clients were unaware of the level of service that could be delivered.	8.0	78.0	8.0	71.0
5	Too much emphasis was placed on the responsibilities of government departments and very little was placed on the responsibilities of the clients	8.5	71.0	8.0	78.0
6	Service standards were sometimes unachievable, thus leading to clients having exaggerated expectations regarding how soon the service could be rendered.	8.0	64.0	8.0	57.0
7	Members of staff were often uninformed regarding their departments service standards and were therefore unaware of whether services were delivered to the standards set by their department.	9.0	100.0	9.0	100.0
8	Certain departments had rigid and uniform service standards across the whole department, which took no account of local (urban vs. rural) or service variations.	9.0	100.0	9.5	100.0
9	Little understanding within some departments that considerable effort is required, beyond simply defining service standards, to implement the concept.	9.0	100.0	9.0	100.0
10	Not linking the concept of service standards to current initiatives to reform the public service in South Africa such as the eight Batho Pele principles.	9.5	100.0	9.5	100.0
No.	SCM Public Procurement Challenges				
1	Lack of proper knowledge, skills and capacity from public servants.	9.5	100.0	9.5	100.0
2	Non-compliance with SCM policy and regulations.	9.0	100.0	9.0	100.0
3	Inadequate planning and linking of demand to the budget.	9.0	100.0	9.5	100.0
4	Accountability, fraud and corruption.	9.0	100.0	9.5	100.0
5	Inadequate monitoring and evaluation of SCM	9.0	100.0	9.0	100.0
6	Too much decentralisation of the procurement system.	9.0	100.0	9.5	100.0
7	Ineffectiveness of the black economic empowerment (BEE) policy.	9.5	100.0	9.5	100.0
No.	IDMS, SIPDM & FIDPM				
1	National Treasury's Infrastructure Delivery Management System (IDMS) as a model for best practice delivery of infrastructure management within the public sector.	9.5	100.0	9.5	100.0
2	National Treasury's Standard for Infrastructure Procurement and Delivery Management (SIPDM) in support of the supply chain for infrastructure procurement and delivery management to all departments, constitutional institutions and public entities.	9.0	100.0	9.0	100.0
3	National Treasury Instruction No.3 of 2019/2020 which repealed the SIPDM effective from 01 st October 2019 and gave legal effect to the Framework for Infrastructure Delivery and Procurement Management (FIDPM).	9.5	100.0	9.5	100.0
No.	Government Ability to Apply the FIDPM				
Principles					

1	*Broad ownership.	7.0	21.0	7.0	28.0
2	Policy consistency.	9.5	100.0	9.5	100.0
3	Planning alignment.	9.0	100.0	9.0	100.0
4	Clarity of responsibility and accountability.	9.5	100.0	9.5	100.0
5	Evidence-based decision making.	9.0	100.0	9.0	100.0
6	Continuous improvement and scalability.	9.0	100.0	9.5	100.0
7	Continuous capacity and capability building.	9.5	100.0	9.5	100.0
Benefits					
8	Understanding of delivery and procurement management processes including governance.	9.5	100.0	9.5	100.0
9	Improved control of infrastructure delivery, due to appropriate decision points.	9.5	100.0	9.5	100.0
10	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9.5	100.0	9.5	100.0
11	*Identification of appropriate delivery options.	6.0	21.0	6.0	28.0
12	Development of programme plans, using simple templates and guides.	9.0	100.0	9.0	100.0
13	Alignment of the allocated budgets to infrastructure programmes.	9.5	100.0	9.5	100.0
14	*Identification and prioritisation of projects.	6.0	28.0	6.0	28.0
15	*Improved operations and maintenance management.	6.0	35.0	6.0	35.0
16	Improved management of the procurement of supplies, services and engineering and construction works.	9.0	100.0	9.0	100.0
17	*Improved management of the planning and design of projects.	6.0	42.0	6.0	42.0
18	*Improved management of procurement and project delivery processes.	6.0	35.0	6.0	35.0
19	Improved oversight of the implementation of projects and performance of the contract administration.	9.0	100.0	9.0	100.0
20	*Good practice guidelines, within a simple structured system, based upon well-defined processes that are necessary to achieve effective infrastructure delivery.	6.0	14.0	6.5	50.0
21	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8.5	100.0	8.5	100.0
22	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9.0	100.0	9.0	100.0
23	A structured environment for inexperienced delivery managers to thrive and gain understanding.	9.0	100.0	9.0	100.0
24	Senior management will have a tool to hold delivery managers accountable for.	9.0	100.0	9.0	100.0
25	*Reporting of progress, performance and impact will be uniformly documented.	6.0	21.0	6.0	35.0
26	The quality and value for money of service delivery will improve.	8.5	100.0	8.5	100.0

Table 8.5: Delphi Results Round 1 – PM Tools and Techniques

DELPHI STUDY - ROUND 1		Importance		Impact	
		Median	% Response (8-10)	Median	% Response (8-10)
Section 3: PM Tools and Techniques					
No.	PM Attributes				
1	Ability to select and develop an operational team from a standing start.	9.5	100.0	9.5	100.0
2	Leadership and management ability.	9.5	100.0	9.5	100.0
3	Ability to anticipate problems, solve problems and make decisions.	9.5	100.0	9.5	100.0
4	Ability to integrate project stakeholders.	9.5	100.0	9.5	100.0
5	Operational flexibility.	9.5	100.0	9.5	100.0
6	Ability to plan, expedite and get things done.	9.5	100.0	9.5	100.0
7	Ability to negotiate and persuade.	9.5	100.0	9.5	100.0
8	Understand the environment within which the project is being managed.	9.0	100.0	9.0	100.0
9	Ability to review, monitor and apply control.	9.0	100.0	9.0	100.0
10	Ability to administer the contract, the scope of work and scope changes.	9.0	100.0	9.0	100.0
11	Ability to manage within the environment of constant change.	9.5	100.0	9.5	100.0
12	The ability to keep the client happy.	9.5	100.0	9.5	100.0
No.	Effective Ways of Introducing Change				
1	Defining what has to be accomplished, in terms of time, cost and quality.	9.0	100.0	9.0	100.0
2	Developing a plan to achieve these and then working this plan.	9.5	100.0	9.5	100.0
3	Using appropriate project management techniques and tools to plan, monitor and maintain progress.	10.0	100.0	10.0	100.0

4	Employing persons skilled in project management, who are given responsibility for introducing the change and are accountable for its successful accomplishment.	10.0	100.0	10.0	100.0
No.	Key Skill Sets of Effective PM's				
1	Technical Project Management - The knowledge, skills and behaviours related to specific domains of project.	9.0	100.0	9.0	100.0
2	Leadership - The knowledge, skills and behaviours needed to guide, motivate and direct a team.	9.0	100.0	9.0	100.0
3	Strategic and Business Management - The knowledge of and expertise in the industry and organisation.	9.0	100.0	9.0	100.0
No.	Ten PM Areas of Expertise and Service Delivery Challenges				
1	Political issues.	9.0	100.0	9.0	100.0
2	Policy issues.	9.5	100.0	9.5	100.0
3	Implementation issues.	10.0	100.0	10.0	100.0
4	Prolonged procurement processes resulting in delayed appointments.	9.0	100.0	9.0	100.0
5	Acute problems of institutional capacity.	9.0	100.0	9.0	100.0
6	Mismanagement of funds.	9.0	100.0	9.0	100.0
7	High levels of corruption.	8.0	57.0	8.0	57.0
8	A lack of public participation.	9.0	100.0	9.0	100.0
9	Absence of people centred culture and lack of objectives in the public service.	9.0	100.0	9.0	100.0
10	Training and development programmes not being underpinned by people first values.	9.0	100.0	9.0	100.0
11	Lack of effective monitoring and evaluation mechanisms internally and externally.	9.0	100.0	9.0	100.0
12	Strategic planning activities on service delivery are limited to senior management.	9.0	100.0	9.0	100.0
13	Poor site management from public servants.	9.5	100.0	9.5	100.0
14	Time and cost variations.	10.0	100.0	10.0	100.0
15	Skills and competency issues.	9.5	100.0	9.5	100.0
No.	Key Institutional Goals				
1	To be more responsive and relevant to the needs of citizens.	10.0	100.0	10.0	100.0
2	To be more efficient and effective in the use of public resources.	9.5	100.0	9.5	100.0
3	To be more representative of the diversity and needs of all.	10.0	100.0	10.0	100.0
4	To improve access to services, make them more responsive to the needs of citizens.	9.5	100.0	9.5	100.0
5	To be more flexible and more efficient in the use of allocated funding.	10.0	100.0	10.0	100.0
6	To remove the control approach of management and accompanying excess regulation.	10.0	100.0	10.0	100.0
7	To have the ability to adjust policies and processes when societal problems are detected.	10.0	100.0	10.0	100.0
8	To better utilise technology in the delivery of services.	9.5	100.0	9.5	100.0
9	To remove public/ private sector competition and promote partnerships.	8.0	57.0	8.0	64.0
No.	Application of IDM Toolkits Principles and Benefits by PM's				
Principles					
1	*Broad ownership.	7.0	21.0	7.0	28.0
2	Policy consistency.	9.5	100.0	9.5	100.0
3	Planning alignment.	9.0	100.0	9.0	100.0
4	Clarity of responsibility and accountability.	9.5	100.0	9.5	100.0
5	Evidence-based decision making.	9.0	100.0	9.0	100.0
6	Continuous improvement and scalability.	9.0	100.0	9.5	100.0
7	Continuous capacity and capability building.	9.5	100.0	9.5	100.0
Benefits					
8	Understanding of delivery and procurement management processes including governance.	9.5	100.0	9.5	100.0
9	Improved control of infrastructure delivery, due to appropriate decision points.	9.5	100.0	9.5	100.0
10	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9.5	100.0	9.5	100.0
11	*Identification of appropriate delivery options.	6.0	21.0	6.0	28.0
12	Development of programme plans, using simple templates and guides.	9.0	100.0	9.0	100.0
13	Alignment of the allocated budgets to infrastructure programmes.	9.5	100.0	9.5	100.0
14	*Identification and prioritisation of projects.	6.0	28.0	6.0	28.0
15	*Improved operations and maintenance management.	6.0	35.0	6.0	35.0
16	Improved management of the procurement of supplies, services and engineering and construction works.	9.0	100.0	9.0	100.0
17	*Improved management of the planning and design of projects.	6.0	42.0	6.0	42.0
18	*Improved management of procurement and project delivery processes.	6.0	35.0	6.0	35.0
19	Improved oversight of the implementation of projects and performance of the contract administration functions.	9.0	100.0	9.0	100.0

20	*Good practice guidelines, within a simple structured system, based upon well-defined processes that are necessary to achieve effective infrastructure delivery.	6.0	14.0	6.5	50.0
21	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8.5	100.0	8.5	100.0
22	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9.0	100.0	9.0	100.0
23	A structured environment for inexperienced delivery managers to thrive and gain understanding.	9.0	100.0	9.0	100.0
24	Senior management will have a tool to hold delivery managers accountable for.	9.0	100.0	9.0	100.0
25	*Reporting of progress, performance and impact will be uniformly documented.	6.0	21.0	6.0	35.0
26	The quality and value for money of service delivery will improve.	8.5	100.0	8.5	100.0
No.	Implementation of IDM Toolkits Principles and Benefits in FIDPM Work Stages				
Principles					
1	*Broad ownership.	7.0	21.0	7.0	28.0
2	Policy consistency.	9.5	100.0	9.5	100.0
3	Planning alignment.	9.0	100.0	9.0	100.0
4	Clarity of responsibility and accountability.	9.5	100.0	9.5	100.0
5	Evidence-based decision making.	9.0	100.0	9.0	100.0
6	Continuous improvement and scalability.	9.0	100.0	9.5	100.0
7	Continuous capacity and capability building.	9.5	100.0	9.5	100.0
Benefits					
8	Understanding of delivery and procurement management processes including governance.	9.5	100.0	9.5	100.0
9	Improved control of infrastructure delivery, due to appropriate decision points.	9.5	100.0	9.5	100.0
10	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9.5	100.0	9.5	100.0
11	*Identification of appropriate delivery options.	6.0	21.0	6.0	28.0
12	Development of programme plans, using simple templates and guides.	9.0	100.0	9.0	100.0
13	Alignment of the allocated budgets to infrastructure programmes.	9.5	100.0	9.5	100.0
14	*Identification and prioritisation of projects.	6.0	28.0	6.0	28.0
15	*Improved operations and maintenance management.	6.0	35.0	6.0	35.0
16	Improved management of the procurement of supplies, services and engineering and construction works.	9.0	100.0	9.0	100.0
17	*Improved management of the planning and design of projects.	6.0	42.0	6.0	42.0
18	*Improved management of procurement and project delivery processes.	6.0	35.0	6.0	35.0
19	Improved oversight of the implementation of projects and performance of the contract administration functions.	9.0	100.0	9.0	100.0
20	*Good practice guidelines, within a simple structured system, based upon well-defined processes that are necessary to achieve effective infrastructure delivery.	6.0	14.0	6.5	50.0
21	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8.5	100.0	8.5	100.0
22	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9.0	100.0	9.0	100.0
23	A structured environment for inexperienced delivery managers to thrive and gain understanding.	9.0	100.0	9.0	100.0
24	Senior management will have a tool to hold delivery managers accountable for.	9.0	100.0	9.0	100.0
25	*Reporting of progress, performance and impact will be uniformly documented.	6.0	21.0	6.0	35.0
26	The quality and value for money of service delivery will improve.	8.5	100.0	8.5	100.0

*28 sub-factors that did not meet the prescribed consensus criteria

Tables 8.3 – 8.5 highlighted that 164 sub-factors achieved consensus in terms of importance and impact ratings and 28 sub-factors did not meet the prescribed consensus criteria and were eliminated. Table 8.6 presents the discussion of the quantitative results of round one. According to the consensus criteria, the group median of the factors was either less than 8, or less than 50% of the respondents gave a rating of 8 and above (for importance and impact) on the 10-point Likert scale.

Table 8.6: Discussion of Delphi Results Round 1

No.	Public Sector	The public sector driver was measured using seven observed variables which had a total of 48 sub-factors. All seven observed variables met the requirements for consensus in the importance and impact criteria. However, two sub-factors did not meet the consensus criteria and were eliminated. As a result, a total of 46 sub-factors met the requirements for consensus in the importance and impact criteria.
1	Recurring Problems in the Public Sector	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
2	Public Service Transformation Strategies	All five sub-factors met the requirements for consensus and were seen as very important with a very high impact.
3	Areas for Improved Efficiency for Transforming Service Delivery	All four sub-factors met the requirements for consensus. However, two sub-factors were seen as very important with a very high impact and two sub-factors were seen as important with a high impact.
4	Batho Pele Principles	All eight sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, three sub-factors were rated 10 for both importance and impact.
5	Service Delivery Challenges	All 15 sub-factors met the requirements for consensus and were seen as very important with a very high impact.
6	Government Processes and Decision Making	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
7	Management Strategies for Service Delivery	Observed variable number seven consisted of five sub-factors. Two sub-factors did not meet consensus in terms of importance and impact ratings: The expert panellists felt that “ <i>Decentralisation and delegation of management responsibility</i> ” including “ <i>Systematic sharing of good practice</i> ” were not important in re-orientating management systems towards improving service delivery. As a result, consensus was not achieved, and these sub-factors eliminated.
No.	Government Policies, Frameworks and the FIDPM	The government policies, frameworks and the FIDPM driver was measured using five observed variables which had a total of 49 sub-factors. All five observed variables met the requirements for consensus in the importance and impact criteria. However, ten sub-factors did not meet the consensus criteria and were eliminated. As a result, a total of 39 sub-factors met the requirements for consensus in the importance and impact criteria.
1	Policy Development and Implementation	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
2	Effective Policy Implementation	Observed variable number two consisted of ten sub-factors. Two sub-factors did not meet consensus in terms of importance and impact ratings: The expert panellists noted that “ <i>Service standards were poorly defined, thus making them difficult to measure</i> ” and “ <i>Considerable confusion exists between service standards and service delivery indicators</i> ” were not important and did not impact government public service standards. In addition, in their experience, service standards are clearly defined. As a result, consensus was not achieved, and these sub-factors eliminated.
3	SCM Public Procurement Challenges	All seven sub-factors met the requirements for consensus and were seen as very important with a very high impact.
4	IDMS, SIPDM & FIDPM	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
5	Government Ability to Apply the FIDPM	Observed variable number five consisted of 26 sub-factors. Eight sub-factors did not meet consensus in terms of importance and impact ratings: The expert panellists highlighted that “ <i>Broad ownership, Identification of appropriate delivery options, Identification and prioritisation of projects,</i>

		<i>Improved operations and maintenance management, Improved management of the planning and design of projects, Improved management of procurement and project delivery processes, Good practice guidelines and Reporting of progress, performance and impact will be uniformly documented</i> ”, were addressed under other sub-factors headings for principles and benefits and wanted to avoid duplication. As a result, consensus was not achieved, and these sub-factors eliminated.
No.	PM Tools and Techniques	The PM tools and techniques driver was measured using seven observed variables which had a total of 95 sub-factors. All seven observed variables met the requirements for consensus in the importance and impact criteria. However, sixteen sub-factors did not meet the consensus criteria and were eliminated. As a result, a total of 79 sub-factors met the requirements for consensus in the importance and impact criteria.
1	PM Attributes	All 12 sub-factors met the requirements for consensus and were seen as very important with a very high impact.
2	Effective Ways of Introducing Change	All four sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
3	Skill Sets of Effective PM’s	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
4	Ten Areas of Expertise and Service Delivery Challenges	All 15 sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
5	Key Institutional Goals	All nine sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, five sub-factors were rated 10 for both importance and impact.
6	Application of IDM Toolkits Principals and Benefits by PM’s	Observed variable number six consisted of 26 sub-factors. Eight sub-factors did not meet consensus in terms of importance and impact ratings: The expert panellists highlighted that “ <i>Broad ownership, Identification of appropriate delivery options, Identification and prioritisation of projects, Improved operations and maintenance management, Improved management of the planning and design of projects, Improved management of procurement and project delivery processes, Good practice guidelines and Reporting of progress, performance and impact will be uniformly documented</i> ”, were addressed under other sub-factors headings for principles and benefits and wanted to avoid duplication. As a result, consensus was not achieved, and these sub-factors eliminated.
7	Implementation of IDM Toolkits Principals and Benefits in FIDPM Work Stages	Observed variable number seven consisted of 26 sub-factors. Eight sub-factors did not meet consensus in terms of importance and impact ratings: The expert panellists highlighted that “ <i>Broad ownership, Identification of appropriate delivery options, Identification and prioritisation of projects, Improved operations and maintenance management, Improved management of the planning and design of projects, Improved management of procurement and project delivery processes, Good practice guidelines and Reporting of progress, performance and impact will be uniformly documented</i> ”, were addressed under other sub-factors headings for principles and benefits and wanted to avoid duplication. As a result, consensus was not achieved, and these sub-factors eliminated.

The second round of the Delphi questionnaire was sent via email to the 14 experts after analysing and summarising the first-round results.

8.3.2 Round Two

In round two, the group median for each factor including the responses of the first round was circulated to the expert panellists. This approach was essential towards ensuring the expert panellists have an overview of the central tendency of the group responses and to afford them the opportunity to make changes were deemed necessary. The expert panellists were requested to provide a reason if the second-round survey responses were to change significantly from the group median. Tables 8.7 – 8.9 presents the second-round responses.

Out of the 14 expert panellists that participated in the first round, all 14 also participated in the second-round survey. Statistical analysis was executed on the responses received and the summary of the second-round survey results was circulated to the 14 expert panellists including the third-round survey questionnaire.

Table 8.7: Delphi Results Round 2 - The Public Sector

DELPHI STUDY - ROUND 2		Importance		Impact	
		Median	% Response (8-10)	Median	% Response (8-10)
Section 1: The Public Sector					
No.	Recurring Problems in the Public Sector				
1	Consistent recurrence of findings.	9,0	100,0	9,0	92,0
2	Resource optimisation, accountability and a non-compliance culture seem to be the main problem areas in the public sector.	9,0	100,0	9,0	100,0
3	The root causes of problems are not being adequately addressed.	9,0	100,0	9,0	100,0
No.	Public Service Transformation Strategies				
1	Generate mission statements for service delivery linked to service guarantees	9,0	100,0	9,0	100,0
2	Identify services and target populations for services with emphases on affordability and redress	9,0	100,0	9,0	100,0
3	Set definite service standards, define outputs and targets and determine performance indicators benchmarked against international standards	9,5	100,0	9,0	100,0
4	Manage service delivery by means of sound human and financial resource management in partnerships with the private sector, nongovernmental organisations and the community	9,0	100,0	9,5	100,0
5	Develop a culture of customer care and context and client sensitive service delivery	9,0	100,0	9,0	100,0
No.	Government Initiatives				
1	Suitable infrastructure and logistics.	9,5	100,0	9,5	100,0
2	Competitive input prices.	9,0	100,0	9,0	92,0
3	Skills and technology.	9,5	100,0	9,5	100,0
4	Innovation and partnerships.	9,0	100,0	9,0	92,0
5	Efficient regulation.	9,5	100,0	9,5	100,0
6	Effective government offerings.	9,0	85,0	9,0	78,0
7	Equitability.	9,5	92,0	9,5	100,0
8	Accountability.	10,0	100,0	10,0	100,0
9	Improving Performance Management.	9,5	100,0	9,5	100,0
No.	Batho Pele Principles				
1	Consultation – citizens should be consulted about their needs.	9,5	100,0	9,5	100,0
2	Standards – all citizens should know what service to expect.	9,5	100,0	9,5	100,0
3	Redress – all citizens should be offered an apology and solution when standards are not met.	8,5	100,0	8,5	76,0
4	Access – all citizens should have equal access to services.	9,0	100,0	9,0	85,0
5	Courtesy – all citizens should be treated courteously.	10,0	100,0	10,0	100,0

6	Information – all citizens are entitled to full, accurate information.	10,0	100,0	10,0	100,0
7	Openness and Transparency – all citizens should know how decisions are made and departments are run.	9,5	100,0	9,5	85,0
8	Value for Money – all services provided should offer value for money.	10,0	100,0	10,0	100,0
No.	Service Delivery Challenges				
1	Political issues.	9,5	100,0	9,5	100,0
2	Policy issues.	9,5	100,0	9,5	100,0
3	Implementation issues.	9,5	100,0	9,5	100,0
4	Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction.	9,5	100,0	9,5	100,0
5	Acute problems of institutional capacity.	9,5	100,0	9,5	100,0
6	Mismanagement of funds.	9,0	100,0	10,0	100,0
7	High levels of corruption.	9,0	100,0	10,0	100,0
8	A lack of public participation.	9,5	100,0	9,5	100,0
9	Absence of people centred culture and lack of objectives in the public service.	9,5	100,0	9,5	100,0
10	Training and development programs not being underpinned by people first values.	9,0	100,0	9,0	100,0
11	Lack of effective monitoring and evaluation mechanisms internally and externally.	9,0	100,0	9,0	100,0
12	Strategic planning activities on service delivery are limited to senior management.	9,5	100,0	9,5	100,0
13	Poor site management from public servants.	9,5	100,0	9,0	100,0
14	Time and cost variations.	9,0	100,0	9,5	100,0
15	Skills and competency issues.	9,5	100,0	9,5	100,0
No.	Government Processes and Decision Making				
1	Detailed regulation and central prescription in South Africa has resulted in excessive bureaucracy and lengthy procedures which are against the interests of customers, internal and external.	10,0	100,0	10,0	100,0
2	Service deliverers are currently forced to spend too much of their time trying to get decisions made and complying with central requirements, many of which hamper the delivery of services to the customer.	10,0	100,0	9,5	100,0
3	Implementing robust risk assessments and management processes at project inception to drive the decision-making process in procurement on public sector projects.	9,5	100,0	9,5	100,0
No.	Management Strategies for Service Delivery				
1	Development of more flexible regulatory frameworks.	9,0	100,0	9,0	100,0
2	Improvement of human resource management systems.	9,0	100,0	9,0	100,0
3	Development of more results-oriented management systems.	9,5	100,0	9,5	100,0

Table 8.8: Delphi Results Round 2 - Government Policies, Frameworks and the FIDPM

DELPHI STUDY - ROUND 2		Importance		Impact	
		Median	% Response (8-10)	Median	% Response (8-10)
Section 2: Government Policies, Frameworks and the FIDPM					
No.	Policy Development and Implementation				
1	Current policy development in SA and policy implementation addresses and deals with their targeted areas of concern regarding improving public service delivery.	9,5	100,0	10,0	100,0
2	Government is good at policy development, understands the policy directions they would like to take, and are successful at implementing policy.	10,0	100,0	9,5	100,0
3	The infrastructure delivery model requires a new trajectory in tackling the under-development and triple challenges of poverty, unemployment and slow economic growth.	10,0	100,0	10,0	100,0
No.	Effective Policy Implementation				
1	Departments not having service standards.	9,0	100,0	9,0	100,0
2	Service standards not readily available to internal or external clients and therefore clients were unaware of the level of service that could be delivered.	8,0	78,0	8,0	71,0
3	Too much emphasis was placed on the responsibilities of government departments and very little emphasis was placed on the responsibilities of the clients who access services.	8,5	71,0	8,0	78,0
4	Service standards were sometimes unachievable, thus leading to clients having exaggerated expectations regarding how soon the service could be rendered.	8,0	64,0	8,0	57,0
5	Members of staff were often uninformed regarding their departments service standards and were therefore unaware of whether services were delivered to the standards set by their department.	9,0	100,0	9,0	100,0

6	Certain departments had rigid and uniform service standards across the whole department, which took no account of local (urban vs. rural) or service variations.	9,0	100,0	9,5	100,0
7	Little understanding within some departments that considerable effort is required, beyond simply defining service standards, to implement the concept.	9,0	100,0	9,0	100,0
8	Not linking the concept of service standards to current initiatives to reform the public service in South Africa such as the eight Batho Pele principles.	9,5	100,0	9,5	100,0
No.	SCM Public Procurement Challenges				
1	Lack of proper knowledge, skills and capacity from public servants.	9,5	100,0	9,5	100,0
2	Non-compliance with SCM policy and regulations.	9,0	100,0	9,0	100,0
3	Inadequate planning and linking of demand to the budget.	9,0	100,0	9,5	100,0
4	Accountability, fraud and corruption.	9,0	100,0	9,5	100,0
5	Inadequate monitoring and evaluation of SCM	9,0	100,0	9,0	100,0
6	Too much decentralisation of the procurement system.	9,0	100,0	9,5	100,0
7	Ineffectiveness of the black economic empowerment (BEE) policy.	9,5	100,0	9,5	100,0
No.	IDMS, SIPDM & FIDPM				
1	National Treasury's Infrastructure Delivery Management System (IDMS) as a model for best practice delivery of infrastructure management within the public sector.	9,5	100,0	9,5	100,0
2	National Treasury's Standard for Infrastructure Procurement and Delivery Management (SIPDM) in support of the supply chain for infrastructure procurement and delivery management to all departments, constitutional institutions and public entities.	9,0	100,0	9,0	100,0
3	National Treasury Instruction No.3 of 2019/2020 which repealed the SIPDM effective from 01 st October 2019 and gave legal effect to the Framework for Infrastructure Delivery and Procurement Management (FIDPM).	9,5	100,0	9,5	100,0
No.	Government Ability to Apply the FIDPM				
Principles					
1	Policy consistency.	9,5	100,0	9,5	100,0
2	Planning alignment.	9,0	100,0	9,0	100,0
3	Clarity of responsibility and accountability.	9,5	100,0	9,5	100,0
4	Evidence-based decision making.	9,0	100,0	9,0	100,0
5	Continuous improvement and scalability (structured to assist all).	9,0	100,0	9,5	100,0
6	Continuous capacity and capability building.	9,5	100,0	9,5	100,0
Benefits					
7	Understanding of delivery and procurement management processes including governance obligations.	9,5	100,0	9,5	100,0
8	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	9,5	100,0	9,5	100,0
9	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9,5	100,0	9,5	100,0
10	Development of programme plans, using simple templates and guides.	9,0	100,0	9,0	100,0
11	Alignment of the allocated budgets to infrastructure programmes.	9,5	100,0	9,5	100,0
12	Improved management of the procurement of supplies, services and engineering and construction works.	9,0	100,0	9,0	100,0
13	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	9,0	100,0	9,0	100,0
14	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8,5	100,0	8,5	100,0
15	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9,0	100,0	9,0	100,0
16	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	9,0	100,0	9,0	100,0
17	Senior management will have a tool to hold delivery managers accountable for performance.	9,0	100,0	9,0	100,0
18	The quality and value for money of service delivery will improve.	8,5	100,0	8,5	100,0

Table 8.9: Delphi Results Round 2 - PM Tools and Techniques

DELPHI STUDY - ROUND 2		Importance		Impact	
		Median	% Response (8-10)	Median	% Response (8-10)
Section 3: PM Tools and Techniques					
No.	PM Attributes				
1	Ability to select and develop an operational team from a standing start.	9,5	100,0	9,5	100,0
2	Leadership and management ability.	9,5	100,0	9,5	100,0
3	Ability to anticipate problems, solve problems and make decisions.	9,5	100,0	9,5	100,0
4	Ability to integrate project stakeholders.	9,5	100,0	9,5	100,0
5	Operational flexibility.	9,5	100,0	9,5	100,0
6	Ability to plan, expedite and get things done.	9,5	100,0	9,5	100,0
7	Ability to negotiate and persuade.	9,5	100,0	9,5	100,0
8	Understand the environment within which the project is being managed.	9,0	100,0	9,0	100,0
9	Ability to review, monitor and apply control.	9,0	100,0	9,0	100,0
10	Ability to administer the contract, the scope of work and scope changes.	9,0	100,0	9,0	100,0
11	*Ability to manage within the environment of constant change.	7,0	42,0	7,0	8,0
12	The ability to keep the client happy.	9,5	100,0	9,5	100,0
No.	Effective Ways of Introducing Change				
1	Defining what has to be accomplished, generally in terms of time, cost and various technical and quality performance parameters.	9,0	100,0	9,0	100,0
2	Developing a plan to achieve these and then working this plan, ensuring that progress is maintained in line with these objectives.	9,5	100,0	9,5	100,0
3	Using appropriate project management techniques and tools to plan, monitor and maintain progress.	10,0	100,0	10,0	100,0
4	Employing persons skilled in project management, including normally a project manager, who are given responsibility for introducing the change and are accountable for its successful accomplishment.	10,0	100,0	10,0	100,0
No.	Key Skill Sets of Effective PM's				
1	Technical Project Management - The knowledge, skills and behaviours related to specific domains of project.	9,0	100,0	9,0	100,0
2	Leadership - The knowledge, skills and behaviours needed to guide, motivate and direct a team.	9,0	100,0	9,0	100,0
3	Strategic and Business Management - The knowledge of and expertise in the industry and organisation.	9,0	100,0	9,0	100,0
No.	Ten PM Areas of Expertise and Service Delivery Challenges				
1	*Political issues.	7,0	21,0	6,5	14,0
2	Policy issues.	9,5	100,0	9,5	100,0
3	Implementation issues.	10,0	100,0	10,0	100,0
4	Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction.	9,0	100,0	9,0	100,0
5	Acute problems of institutional capacity.	9,0	100,0	9,0	100,0
6	Mismanagement of funds.	9,0	100,0	9,0	100,0
7	*High levels of corruption.	7,0	42,0	7,0	42,0
8	A lack of public participation.	9,0	100,0	9,0	100,0
9	Absence of people centred culture and lack of objectives in the public service.	9,0	100,0	9,0	100,0
10	Training and development programmes not being underpinned by people first values.	9,0	100,0	9,0	100,0
11	Lack of effective monitoring and evaluation mechanisms internally and externally.	9,0	100,0	9,0	100,0
12	Strategic planning activities on service delivery are limited to senior management.	9,0	100,0	9,0	100,0
13	Poor site management from public servants.	9,5	100,0	9,5	100,0
14	Time and cost variations.	10,0	100,0	10,0	100,0
15	Skills and competency issues.	9,5	100,0	9,5	100,0
No.	Key Institutional Goals				
1	To be more responsive and relevant to the needs of citizens.	10,0	100,0	10,0	100,0
2	To be more efficient and effective in the use of public resources.	9,5	100,0	9,5	100,0
3	To be more representative of the diversity and needs of all, especially the most disadvantaged sectors of society.	10,0	100,0	10,0	100,0
4	To improve access to services, make them more responsive to the needs of citizens.	9,5	100,0	9,5	100,0
5	To be more flexible and more efficient in the use of allocated funding.	10,0	100,0	10,0	100,0

6	To remove the command/ control approach of management and accompanying excess regulation.	10,0	100,0	10,0	100,0
7	To have the ability to adjust policies and processes when societal problems are detected.	10,0	100,0	10,0	100,0
8	To better utilise technology in the delivery of services.	9,5	100,0	9,5	100,0
9	*To remove public/ private sector competition and promote partnerships.	7,0	21,0	7,0	14,0
No.	Application of IDM Toolkits Principles and Benefits by PM's				
Principles					
1	Policy consistency.	9,5	100,0	9,5	100,0
2	Planning alignment.	9,0	100,0	9,0	100,0
3	Clarity of responsibility and accountability.	9,5	100,0	9,5	100,0
4	Evidence-based decision making.	9,0	100,0	9,0	100,0
5	Continuous improvement and scalability (structured to assist all).	9,0	100,0	9,5	100,0
6	Continuous capacity and capability building.	9,5	100,0	9,5	100,0
Benefits					
7	Understanding of delivery and procurement management processes including governance obligations.	9,5	100,0	9,5	100,0
8	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	9,5	100,0	9,5	100,0
9	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9,5	100,0	9,5	100,0
10	Development of programme plans, using simple templates and guides.	9,0	100,0	9,0	100,0
11	Alignment of the allocated budgets to infrastructure programmes.	9,5	100,0	9,5	100,0
12	Improved management of the procurement of supplies, services and engineering and construction works.	9,0	100,0	9,0	100,0
13	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	9,0	100,0	9,0	100,0
14	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8,5	100,0	8,5	100,0
15	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9,0	100,0	9,0	100,0
16	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	9,0	100,0	9,0	100,0
17	Senior management will have a tool to hold delivery managers accountable for performance.	9,0	100,0	9,0	100,0
18	The quality and value for money of service delivery will improve.	8,5	100,0	8,5	100,0
No.	Implementation of IDM Toolkits Principles and Benefits in FIDPM Work Stages				
Principles					
1	Policy consistency.	9,5	100,0	9,5	100,0
2	Planning alignment.	9,0	100,0	9,0	100,0
3	Clarity of responsibility and accountability.	9,5	100,0	9,5	100,0
4	Evidence-based decision making.	9,0	100,0	9,0	100,0
5	Continuous improvement and scalability (structured to assist all).	9,0	100,0	9,5	100,0
6	Continuous capacity and capability building.	9,5	100,0	9,5	100,0
Benefits					
7	Understanding of delivery and procurement management processes including governance obligations.	9,5	100,0	9,5	100,0
8	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	9,5	100,0	9,5	100,0
9	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9,5	100,0	9,5	100,0
10	Development of programme plans, using simple templates and guides.	9,0	100,0	9,0	100,0
11	Alignment of the allocated budgets to infrastructure programmes.	9,5	100,0	9,5	100,0
12	Improved management of the procurement of supplies, services and engineering and construction works.	9,0	100,0	9,0	100,0
13	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	9,0	100,0	9,0	100,0
14	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8,5	100,0	8,5	100,0
15	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9,0	100,0	9,0	100,0
16	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	9,0	100,0	9,0	100,0
17	Senior management will have a tool to hold delivery managers accountable for performance.	9,0	100,0	9,0	100,0
18	The quality and value for money of service delivery will improve.	8,5	100,0	8,5	100,0

*4 sub-factors that did not meet the prescribed consensus criteria.

Tables 8.7 – 8.9 highlighted that 160 sub-factors achieved consensus in terms of importance and impact ratings and 4 sub-factors did not meet the prescribed consensus criteria and were eliminated. Table 8.10 presents the discussion of the quantitative results of round two. According to the consensus criteria, the group median of the factors was either less than 8, or less than 50% of the respondents gave a rating of 8 and above (for importance and impact) on the 10-point Likert scale.

Table 8.10: Discussion of Delphi Results Round 2

No.	Public Sector	The public sector measured using seven observed variables which had a total of 46 sub-factors. All seven observed variables and 46 sub factors met the requirements for consensus in the importance and impact criteria.
1	Recurring Problems in the Public Sector	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
2	Public Service Transformation Strategies	All five sub-factors met the requirements for consensus and were seen as very important with a very high impact.
3	Government Initiatives	All nine sub-factors met the requirements for consensus and were seen as very important with a very high impact.
4	Batho Pele Principles	All eight sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, three sub-factors were rated 10 for both importance and impact.
5	Service Delivery Challenges	All 15 sub-factors met the requirements for consensus and were seen as very important with a very high impact.
6	Government Processes and Decision Making	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
7	Management Strategies for Service Delivery	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
No.	Government Policies, Frameworks and the FIDPM	The government policies, frameworks and the FIDPM driver were measured using five observed variables which had a total of 39 sub-factors. All five observed variables and 39 sub-factors met the requirements for consensus in the importance and impact criteria.
1	Policy Development and Implementation	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
2	Effective Policy Implementation	All eight sub-factors met the requirements for consensus and were seen as very important with a very high impact.
3	SCM Public Procurement Challenges	All seven sub-factors met the requirements for consensus and were seen as very important with a very high impact.
4	IDMS, SIPDM & FIDPM	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
5	Government Ability to Apply the FIDPM	All 18 sub-factors met the requirements for consensus and were seen as very important with a very high impact.
No.	PM Tools and Techniques	The PM tools and techniques driver was measured using seven observed variables which had a total of 79 sub-factors. All seven observed variables met the requirements for consensus in the importance and impact criteria. However, four sub-factors did not meet the consensus criteria and were eliminated. As a result, a total of 75 sub-factors met the requirements for consensus in the importance and impact criteria.

1	PM Attributes	Observed variable number two consisted of 12 sub-factors. One sub-factor did not meet consensus in terms of importance and impact ratings: The expert panellists felt that “ <i>Ability to manage within the environment of constant change</i> ”, were addressed under other sub-factors headings for project management attributes and wanted to avoid duplication. As a result, consensus was not achieved, and this sub-factor eliminated.
2	Effective Ways of Introducing Change	All four sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
3	Skill Sets of Effective PM’s	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
4	Ten Areas of Expertise and Service Delivery Challenges	Observed variable number five consisted of 15 sub-factors. Two sub-factors did not meet consensus in terms of importance and impact ratings: The expert panellists indicated that not every PM will be equipped with the knowledge, skills, tools and techniques to address “ <i>Political issues</i> ” and “ <i>High levels of corruption</i> ” in public sector projects, further emphasising that while these issues influence and impact service delivery positively and negatively, should be removed. As a result, consensus was not achieved, and these sub-factors eliminated.
5	Key Institutional Goals	Observed variable number six consisted of nine sub-factors. One sub-factor did not meet consensus in terms of importance and impact ratings: The expert panellists highlighted that “ <i>To remove public/ private sector competition and promote partnerships</i> ”, has been implemented and facilitated through numerous organs of state over the past two decades, yet to date service delivery is still a challenge. In addition, expert panellists noted that competition is healthy and promotes service delivery targets being met as both sectors promote service delivery implementation. As a result, consensus was not achieved, and this sub-factor eliminated.
6	Application of IDM Toolkits Principals and Benefits by PM’s	All 18 sub-factors met the requirements for consensus and were seen as very important with a very high impact.
7	Implementation of IDM Toolkits Principals and Benefits in FIDPM Work Stages	All 18 sub-factors met the requirements for consensus and were seen as very important with a very high impact.

The third round of the Delphi questionnaire was sent via email to the 14 experts after analysing and summarising the second-round results. In this study, the researcher opted to implement three rounds of the Delphi in order to achieve a heterogeneous sample. However, in order to prevent the panel from getting tiresome and fatigued the iterations were as few as possible as the two main purposes of the multiple rounds is to reach consensus and improve precision (Skulmosi *et al.* 2007; Hallowell and Gambatese, 2010)

8.3.3 Round Three

In round three, the group median for each factor including the responses of the second round was circulated to the expert panellists. This approach was essential towards ensuring the expert panellists have an overview of the central tendency of the group responses and to afford them the opportunity to make changes were deemed necessary. The expert panellists were again requested to provide a reason

if the third-round survey responses were to change significantly from the group median. Tables 8.11 – 8.13 presents the third-round responses.

Similar to the results identified in round two, Tables 8.11 – 8.13 exemplifies that 160 sub-factors met the criteria for consensus under the importance and impact ratings. The consensus criteria prescribe that, the group median of the factors must be equal to or higher than 8, and more that 50% of the respondents must provide a rating of 8 and above (for importance and impact) on the 10-point Likert scale. The Delphi survey was terminated at the end of round three as consensus was achieved.

Table 8.11: Delphi Results Round 3 – The Public Sector

DELPHI STUDY - ROUND 3		Importance		Impact	
		Median	% Response (8-10)	Median	% Response (8-10)
Section 1: The Public Sector					
No.	Recurring Problems in the Public Sector				
1	Consistent recurrence of findings.	9,0	100,0	9,0	92,0
2	Resource optimisation, accountability and a non-compliance culture seem to be the main problem areas in the public sector.	9,0	100,0	9,0	100,0
3	The root causes of problems are not being adequately addressed.	9,0	100,0	9,0	100,0
No.	Public Service Transformation Strategies				
1	Generate mission statements for service delivery linked to service guarantees	9,0	100,0	9,0	100,0
2	Identify services and target populations for services with emphases on affordability and redress	9,0	100,0	9,0	100,0
3	Set definite service standards, define outputs and targets and determine performance indicators benchmarked against international standards	9,5	100,0	9,0	100,0
4	Manage service delivery by means of sound human and financial resource management in partnerships with the private sector, nongovernmental organisations and the community	9,0	100,0	9,5	100,0
5	Develop a culture of customer care and context and client sensitive service delivery	9,0	100,0	9,0	100,0
No.	Government Initiatives				
1	Suitable infrastructure and logistics.	9,5	100,0	9,5	100,0
2	Competitive input prices.	9,0	100,0	9,0	92,0
3	Skills and technology.	9,5	100,0	9,5	100,0
4	Innovation and partnerships.	9,0	100,0	9,0	92,0
5	Efficient regulation.	9,5	100,0	9,5	100,0
6	Effective government offerings.	9,0	85,0	9,0	78,0
7	Equitability.	9,5	92,0	9,5	100,0
8	Accountability.	10,0	100,0	10,0	100,0
9	Improving Performance Management.	9,5	100,0	9,5	100,0
No.	Batho Pele Principles				
1	Consultation – citizens should be consulted about their needs.	9,5	100,0	9,5	100,0
2	Standards – all citizens should know what service to expect.	9,5	100,0	9,5	100,0
3	Redress – all citizens should be offered an apology and solution when standards are not met.	8,5	100,0	8,5	76,0
4	Access – all citizens should have equal access to services.	9,0	100,0	9,0	85,0
5	Courtesy – all citizens should be treated courteously.	10,0	100,0	10,0	100,0
6	Information – all citizens are entitled to full, accurate information.	10,0	100,0	10,0	100,0
7	Openness and Transparency – all citizens should know how decisions are made and departments are run.	9,5	100,0	9,5	85,0
8	Value for Money – all services provided should offer value for money.	10,0	100,0	10,0	100,0
No.	Service Delivery Challenges				
1	Political issues.	9,5	100,0	9,5	100,0
2	Policy issues.	9,5	100,0	9,5	100,0

3	Implementation issues.	9,5	100,0	9,5	100,0
4	Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction.	9,5	100,0	9,5	100,0
5	Acute problems of institutional capacity.	9,5	100,0	9,5	100,0
6	Mismanagement of funds.	9,0	100,0	10,0	100,0
7	High levels of corruption.	9,0	100,0	10,0	100,0
8	A lack of public participation.	9,5	100,0	9,5	100,0
9	Absence of people centred culture and lack of objectives in the public service.	9,5	100,0	9,5	100,0
10	Training and development programs not being underpinned by people first values.	9,0	100,0	9,0	100,0
11	Lack of effective monitoring and evaluation mechanisms internally and externally.	9,0	100,0	9,0	100,0
12	Strategic planning activities on service delivery are limited to senior management.	9,5	100,0	9,5	100,0
13	Poor site management from public servants.	9,5	100,0	9,0	100,0
14	Time and cost variations.	9,0	100,0	9,5	100,0
15	Skills and competency issues.	9,5	100,0	9,5	100,0
No.	Government Processes and Decision Making				
1	Detailed regulation and central prescription in South Africa has resulted in excessive bureaucracy and lengthy procedures which are against the interests of customers, internal and external.	10,0	100,0	10,0	100,0
2	Service deliverers are currently forced to spend too much of their time trying to get decisions made and complying with central requirements, many of which hamper the delivery of services to the customer.	10,0	100,0	9,5	100,0
3	Implementing robust risk assessments and management processes at project inception to drive the decision-making process in procurement on public sector projects.	9,5	100,0	9,5	100,0
No.	Management Strategies for Service Delivery				
1	Development of more flexible regulatory frameworks.	9,0	100,0	9,0	100,0
2	Improvement of human resource management systems.	9,0	100,0	9,0	100,0
3	Development of more results-oriented management systems.	9,5	100,0	9,5	100,0

Table 8.12: Delphi Results Round 3 – Government Policies, Frameworks and the FIDPM

DELPHI STUDY - ROUND 3		Importance		Impact	
		Median	% Response (8-10)	Median	% Response (8-10)
Section 2: Government Policies, Frameworks and the FIDPM					
No.	Policy Development and Implementation				
1	Current policy development in SA and policy implementation addresses and deals with their targeted areas of concern regarding improving public service delivery.	9,5	100,0	10,0	100,0
2	Government is good at policy development, understands the policy directions they would like to take, and are successful at implementing policy.	10,0	100,0	9,5	100,0
3	The infrastructure delivery model requires a new trajectory in tackling the under-development and triple challenges of poverty, unemployment and slow economic growth.	10,0	100,0	10,0	100,0
No.	Effective Policy Implementation				
1	Departments not having service standards.	9,0	100,0	9,0	100,0
2	Service standards not readily available to internal or external clients and therefore clients were unaware of the level of service that could be delivered.	8,0	78,0	8,0	71,0
3	Too much emphasis was placed on the responsibilities of government departments and very little emphasis was placed on the responsibilities of the clients who access services.	8,5	71,0	8,0	78,0
4	Service standards were sometimes unachievable, thus leading to clients having exaggerated expectations regarding how soon the service could be rendered.	8,0	64,0	8,0	57,0
5	Members of staff were often uninformed regarding their departments service standards and were therefore unaware of whether services were delivered to the standards set by their department.	9,0	100,0	9,0	100,0
6	Certain departments had rigid and uniform service standards across the whole department, which took no account of local (urban vs. rural) or service variations.	9,0	100,0	9,5	100,0
7	Little understanding within some departments that considerable effort is required, beyond simply defining service standards, to implement the concept.	9,0	100,0	9,0	100,0
8	Not linking the concept of service standards to current initiatives to reform the public service in South Africa such as the eight Batho Pele principles.	9,5	100,0	9,5	100,0
No.	SCM Public Procurement Challenges				
1	Lack of proper knowledge, skills and capacity from public servants.	9,5	100,0	9,5	100,0

2	Non-compliance with SCM policy and regulations.	9,0	100,0	9,0	100,0
3	Inadequate planning and linking of demand to the budget.	9,0	100,0	9,5	100,0
4	Accountability, fraud and corruption.	9,0	100,0	9,5	100,0
5	Inadequate monitoring and evaluation of SCM	9,0	100,0	9,0	100,0
6	Too much decentralisation of the procurement system.	9,0	100,0	9,5	100,0
7	Ineffectiveness of the black economic empowerment (BEE) policy.	9,5	100,0	9,5	100,0
No.	IDMS, SIPDM & FIDPM				
1	National Treasury's Infrastructure Delivery Management System (IDMS) as a model for best practice delivery of infrastructure management within the public sector.	9,5	100,0	9,5	100,0
2	National Treasury's Standard for Infrastructure Procurement and Delivery Management (SIPDM) in support of the supply chain for infrastructure procurement and delivery management to all departments, constitutional institutions and public entities.	9,0	100,0	9,0	100,0
3	National Treasury Instruction No.3 of 2019/2020 which repealed the SIPDM effective from 01 st October 2019 and gave legal effect to the Framework for Infrastructure Delivery and Procurement Management (FIDPM).	9,5	100,0	9,5	100,0
No.	Government Ability to Apply the FIDPM				
Principles					
1	Policy consistency.	9,5	100,0	9,5	100,0
2	Planning alignment.	9,0	100,0	9,0	100,0
3	Clarity of responsibility and accountability.	9,5	100,0	9,5	100,0
4	Evidence-based decision making.	9,0	100,0	9,0	100,0
5	Continuous improvement and scalability (structured to assist all).	9,0	100,0	9,5	100,0
6	Continuous capacity and capability building.	9,5	100,0	9,5	100,0
Benefits					
7	Understanding of delivery and procurement management processes including governance obligations.	9,5	100,0	9,5	100,0
8	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	9,5	100,0	9,5	100,0
9	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9,5	100,0	9,5	100,0
10	Development of programme plans, using simple templates and guides.	9,0	100,0	9,0	100,0
11	Alignment of the allocated budgets to infrastructure programmes.	9,5	100,0	9,5	100,0
12	Improved management of the procurement of supplies, services and engineering and construction works.	9,0	100,0	9,0	100,0
13	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	9,0	100,0	9,0	100,0
14	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8,5	100,0	8,5	100,0
15	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9,0	100,0	9,0	100,0
16	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	9,0	100,0	9,0	100,0
17	Senior management will have a tool to hold delivery managers accountable for performance.	9,0	100,0	9,0	100,0
18	The quality and value for money of service delivery will improve.	8,5	100,0	8,5	100,0

Table 8.13: Delphi Results Round 3 – PM Tools and Techniques

DELPHI STUDY - ROUND 3		Importance		Impact	
		Median	% Response (8-10)	Median	% Response (8-10)
Section 3: PM Tools and Techniques					
No.	PM Attributes				
1	Ability to select and develop an operational team from a standing start.	9,5	100,0	9,5	100,0
2	Leadership and management ability.	9,5	100,0	9,5	100,0
3	Ability to anticipate problems, solve problems and make decisions.	9,5	100,0	9,5	100,0
4	Ability to integrate project stakeholders.	9,5	100,0	9,5	100,0
5	Operational flexibility.	9,5	100,0	9,5	100,0
6	Ability to plan, expedite and get things done.	9,5	100,0	9,5	100,0
7	Ability to negotiate and persuade.	9,5	100,0	9,5	100,0
8	Understand the environment within which the project is being managed.	9,0	100,0	9,0	100,0

9	Ability to review, monitor and apply control.	9,0	100,0	9,0	100,0
10	Ability to administer the contract, the scope of work and scope changes.	9,0	100,0	9,0	100,0
11	The ability to keep the client happy.	9,5	100,0	9,5	100,0
No.	Effective Ways of Introducing Change				
1	Defining what has to be accomplished, generally in terms of time, cost and various technical and quality performance parameters.	9,0	100,0	9,0	100,0
2	Developing a plan to achieve these and then working this plan, ensuring that progress is maintained in line with these objectives.	9,5	100,0	9,5	100,0
3	Using appropriate project management techniques and tools to plan, monitor and maintain progress.	10,0	100,0	10,0	100,0
4	Employing persons skilled in project management, including normally a project manager, who are given responsibility for introducing the change and are accountable for its successful accomplishment.	10,0	100,0	10,0	100,0
No.	Key Skill Sets of Effective PM's				
1	Technical Project Management - The knowledge, skills and behaviours related to specific domains of project.	9,0	100,0	9,0	100,0
2	Leadership - The knowledge, skills and behaviours needed to guide, motivate and direct a team.	9,0	100,0	9,0	100,0
3	Strategic and Business Management - The knowledge of and expertise in the industry and organisation.	9,0	100,0	9,0	100,0
No.	Ten PM Areas of Expertise and Service Delivery Challenges				
1	Policy issues.	9,5	100,0	9,5	100,0
2	Implementation issues.	10,0	100,0	10,0	100,0
3	Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction.	9,0	100,0	9,0	100,0
4	Acute problems of institutional capacity.	9,0	100,0	9,0	100,0
5	Mismanagement of funds.	9,0	100,0	9,0	100,0
6	A lack of public participation.	9,0	100,0	9,0	100,0
7	Absence of people centred culture and lack of objectives in the public service.	9,0	100,0	9,0	100,0
8	Training and development programmes not being underpinned by people first values.	9,0	100,0	9,0	100,0
9	Lack of effective monitoring and evaluation mechanisms internally and externally.	9,0	100,0	9,0	100,0
10	Strategic planning activities on service delivery are limited to senior management.	9,0	100,0	9,0	100,0
11	Poor site management from public servants.	9,5	100,0	9,5	100,0
12	Time and cost variations.	10,0	100,0	10,0	100,0
13	Skills and competency issues.	9,5	100,0	9,5	100,0
No.	Key Institutional Goals				
1	To be more responsive and relevant to the needs of citizens.	10,0	100,0	10,0	100,0
2	To be more efficient and effective in the use of public resources.	9,5	100,0	9,5	100,0
3	To be more representative of the diversity and needs of all, especially the most disadvantaged sectors of society.	10,0	100,0	10,0	100,0
4	To improve access to services, make them more responsive to the needs of citizens.	9,5	100,0	9,5	100,0
5	To be more flexible and more efficient in the use of allocated funding.	10,0	100,0	10,0	100,0
6	To remove the command/ control approach of management and accompanying excess regulation.	10,0	100,0	10,0	100,0
7	To have the ability to adjust policies and processes when societal problems are detected.	10,0	100,0	10,0	100,0
8	To better utilise technology in the delivery of services.	9,5	100,0	9,5	100,0
No.	Application of IDM Toolkits Principles and Benefits by PM's				
Principles					
1	Policy consistency.	9,5	100,0	9,5	100,0
2	Planning alignment.	9,0	100,0	9,0	100,0
3	Clarity of responsibility and accountability.	9,5	100,0	9,5	100,0
4	Evidence-based decision making.	9,0	100,0	9,0	100,0
5	Continuous improvement and scalability (structured to assist all).	9,0	100,0	9,5	100,0
6	Continuous capacity and capability building.	9,5	100,0	9,5	100,0
Benefits					
7	Understanding of delivery and procurement management processes including governance obligations.	9,5	100,0	9,5	100,0
8	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	9,5	100,0	9,5	100,0
9	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9,5	100,0	9,5	100,0
10	Development of programme plans, using simple templates and guides.	9,0	100,0	9,0	100,0
11	Alignment of the allocated budgets to infrastructure programmes.	9,5	100,0	9,5	100,0

12	Improved management of the procurement of supplies, services and engineering and construction works.	9,0	100,0	9,0	100,0
13	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	9,0	100,0	9,0	100,0
14	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8.5	100,0	8.5	100,0
15	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9,0	100,0	9,0	100,0
16	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	9,0	100,0	9,0	100,0
17	Senior management will have a tool to hold delivery managers accountable for performance.	9,0	100,0	9,0	100,0
18	The quality and value for money of service delivery will improve.	8.5	100,0	8.5	100,0
No.	Implementation of IDM Toolkits Principles and Benefits in FIDPM Work Stages				
Principles					
1	Policy consistency.	9.5	100,0	9.5	100,0
2	Planning alignment.	9,0	100,0	9,0	100,0
3	Clarity of responsibility and accountability.	9.5	100,0	9.5	100,0
4	Evidence-based decision making.	9,0	100,0	9,0	100,0
5	Continuous improvement and scalability (structured to assist all).	9,0	100,0	9.5	100,0
6	Continuous capacity and capability building.	9.5	100,0	9.5	100,0
Benefits					
7	Understanding of delivery and procurement management processes including governance obligations.	9.5	100,0	9.5	100,0
8	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	9.5	100,0	9.5	100,0
9	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9.5	100,0	9.5	100,0
10	Development of programme plans, using simple templates and guides.	9,0	100,0	9,0	100,0
11	Alignment of the allocated budgets to infrastructure programmes.	9.5	100,0	9.5	100,0
12	Improved management of the procurement of supplies, services and engineering and construction works.	9,0	100,0	9,0	100,0
13	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	9,0	100,0	9,0	100,0
14	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8.5	100,0	8.5	100,0
15	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9,0	100,0	9,0	100,0
16	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	9,0	100,0	9,0	100,0
17	Senior management will have a tool to hold delivery managers accountable for performance.	9,0	100,0	9,0	100,0
18	The quality and value for money of service delivery will improve.	8.5	100,0	8.5	100,0

The results of the second and third round survey showed significant convergence with no major difference. As a result, consensus was achieved in the third round and the Delphi survey stopped. Table 8.14 presents the discussion of the quantitative results of round three.

Table 8.14: Discussion of Delphi Results Round 3

No.	Public Sector	The public sector measured using seven observed variables which had a total of 46 sub-factors. All seven observed variables and 46 sub factors met the requirements for consensus in the importance and impact criteria.
1	Recurring Problems in the Public Sector	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
2	Public Service Transformation Strategies	All five sub-factors met the requirements for consensus and were seen as very important with a very high impact.

3	Areas for Improved Efficiency for Transforming Service Delivery	All four sub-factors met the requirements for consensus. However, two sub-factors were seen as very important with a very high impact and two sub-factors were seen as important with a high impact.
4	Batho Pele Principles	All eight sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, three sub-factors were rated 10 for both importance and impact.
5	Service Delivery Challenges	All 15 sub-factors met the requirements for consensus and were seen as very important with a very high impact.
6	Government Processes and Decision Making	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
7	Management Strategies for Service Delivery	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
No.	Government Policies, Frameworks and the FIDPM	The government policies, frameworks and the FIDPM driver were measured using five observed variables which had a total of 39 sub-factors. All five observed variables and 39 sub-factors met the requirements for consensus in the importance and impact criteria.
1	Policy Development and Implementation	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
2	Effective Policy Implementation	All eight sub-factors met the requirements for consensus and were seen as very important with a very high impact.
3	SCM Public Procurement Challenges	All seven sub-factors met the requirements for consensus and were seen as very important with a very high impact.
4	IDMS, SIPDM & FIDPM	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
5	Government Ability to Apply the FIDPM	All 18 sub-factors met the requirements for consensus and were seen as very important with a very high impact.
No.	PM Tools and Techniques	The PM tools and techniques driver for improving public service delivery was measured using seven observed variables which had a total of 77 sub-factors. All seven factors and 75 sub-factors met the requirements for consensus in the importance and impact criteria.
1	PM Attributes	All 11 sub-factors met the requirements for consensus and were seen as very important with a very high impact.
2	Effective Ways of Introducing Change	All four sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
3	Skill Sets of Effective PM's	All three sub-factors met the requirements for consensus and were seen as very important with a very high impact.
4	Ten Areas of Expertise and Service Delivery Challenges	All 13 sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, two sub-factors were rated 10 for both importance and impact.
5	Key Institutional Goals	All eight sub-factors met the requirements for consensus and were seen as very important with a very high impact. In addition, five sub-factors were rated 10 for both importance and impact.
6	Application of IDM Toolkits Principals and Benefits by PM's	All 18 sub-factors met the requirements for consensus and were seen as very important with a very high impact.
7	Implementation of IDM Toolkits Principals and Benefits in FIDPM Work Stages	All 18 sub-factors met the requirements for consensus and were seen as very important with a very high impact.

Tables 8.15 – 8.17 presents the 160 sub-factors under 19 unobserved variables and three key drivers considered for further study, which were based on the analysis from the preceding rounds.

Table 8.15: Summary of the Three Delphi Survey Rounds – The Public Sector

DELPHI STUDY - ROUNDS 1, 2 & 3		ROUND 1			ROUND 2			ROUND 3		
		Importance Median	Impact Median	Consensus Achieved	Importance Median	Impact Median	Consensus Achieved	Importance Median	Impact Median	Consensus Achieved
Section 1: The Public Sector										
No.	Recurring Problems in the Public Sector									
1	Consistent recurrence of findings.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
2	Resource optimisation, accountability and a non-compliance culture seem to be the main problem areas in the public sector.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
3	The root causes of problems are not being adequately addressed.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
No.	Public Service Transformation Strategies									
1	Generate mission statements for service delivery linked to service guarantees	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
2	Identify services and target populations for services with emphases on affordability and redress	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
3	Set definite service standards, define outputs and targets and determine performance indicators benchmarked against international standards	9,5	9,0	Yes	9,5	9,0	Yes	9,5	9,0	Yes
4	Manage service delivery by means of sound human and financial resource management in partnerships with the private sector, nongovernmental organisations and the community	9,0	9,5	Yes	9,0	9,5	Yes	9,0	9,5	Yes
5	Develop a culture of customer care and context and client sensitive service delivery	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
No.	Government Initiatives									
1	Suitable infrastructure and logistics.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
2	Competitive input prices.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
3	Skills and technology.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
4	Innovation and partnerships.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
5	Efficient regulation.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
6	Effective government offerings.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
7	Equitability.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
8	Accountability.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
9	Improving Performance Management.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
No.	Batho Pele Principles									
1	Consultation – citizens should be consulted about their needs.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
2	Standards – all citizens should know what service to expect.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
3	Redress – all citizens should be offered an apology and solution when standards are not met.	8,5	8,5	Yes	8,5	8,5	Yes	8,5	8,5	Yes
4	Access – all citizens should have equal access to services.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
5	Courtesy – all citizens should be treated courteously.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
6	Information – all citizens are entitled to full, accurate information.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
7	Openness and Transparency – all citizens should know how decisions are made and departments are run.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
8	Value for Money – all services provided should offer value for money.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
No.	Service Delivery Challenges									
1	Political issues.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes

2	Policy issues.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
3	Implementation issues.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
4	Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
5	Acute problems of institutional capacity.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
6	Mismanagement of funds.	9.0	10.0	Yes	9.0	10.0	Yes	9.0	10.0	Yes
7	High levels of corruption.	9.0	10.0	Yes	9.0	10.0	Yes	9.0	10.0	Yes
8	A lack of public participation.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
9	Absence of people centred culture and lack of objectives in the public service.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
10	Training and development programs not being underpinned by people first values.	9.0	9.0	Yes	9.0	9.0	Yes	9.0	9.0	Yes
11	Lack of effective monitoring and evaluation mechanisms internally and externally.	9.0	9.0	Yes	9.0	9.0	Yes	9.0	9.0	Yes
12	Strategic planning activities on service delivery are limited to senior management.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
13	Poor site management from public servants.	9.5	9.0	Yes	9.5	9.0	Yes	9.5	9.0	Yes
14	Time and cost variations.	9.0	9.5	Yes	9.0	9.5	Yes	9.0	9.5	Yes
15	Skills and competency issues.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
No.	Government Processes and Decision Making									
1	Detailed regulation and central prescription in South Africa has resulted in excessive bureaucracy and lengthy procedures which are against the interests of customers, internal and external.	10.0	10.0	Yes	10.0	10.0	Yes	10.0	10.0	Yes
2	Service deliverers are currently forced to spend too much of their time trying to get decisions made and complying with central requirements, many of which hamper the delivery of services to the customer.	10.0	9.5	Yes	10.0	9.5	Yes	10.0	9.5	Yes
3	Implementing robust risk assessments and management processes at project inception to drive the decision-making process in procurement on public sector projects.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
No.	Management Strategies for Service Delivery									
1	Development of more flexible regulatory frameworks.	9.0	9.0	Yes	9.0	9.0	Yes	9.0	9.0	Yes
2	Improvement of human resource management systems.	9.0	9.0	Yes	9.0	9.0	Yes	9.0	9.0	Yes
3	Development of more results-oriented management systems.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
4	Decentralisation and delegation of management responsibility.	7.0	7.0	No						
5	Systematic sharing of good practice.	7.0	7.0	No						

Table 8.16: Summary of the Three Delphi Survey Rounds – Government Policies, Frameworks and the FIDPM

DELPHI STUDY - ROUNDS 1, 2 & 3		ROUND 1			ROUND 2			ROUND 3		
		Importance Median	Impact Median	Consensus Achieved	Importance Median	Impact Median	Consensus Achieved	Importance Median	Impact Median	Consensus Achieved
Section 2: Government Policies, Frameworks and the FIDPM										
No.	Policy Development and Implementation									
1	Current policy development in SA and policy implementation addresses and deals with their targeted areas of concern regarding improving public service delivery.	9.5	10.0	Yes	9.5	10.0	Yes	9.5	10.0	Yes
2	Government is good at policy development, understands the policy directions they would like to take, and are successful at implementing policy.	10.0	9.5	Yes	10.0	9.5	Yes	10.0	9.5	Yes
3	The infrastructure delivery model requires a new trajectory in tackling the under-development and	10.0	10.0	Yes	10.0	10.0	Yes	10.0	10.0	Yes

	triple challenges of poverty, unemployment and slow economic growth.									
No.	Effective Policy Implementation									
1	Departments not having service standards.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
2	Service standards were poorly defined, thus making them difficult to measure.	6,0	6,5	No						
3	Considerable confusion exists between service standards and service delivery indicators.	6,0	6,5	No						
4	Service standards not readily available to internal or external clients and therefore clients were unaware of the level of service that could be delivered.	8,0	8,0	Yes	8,0	8,0	Yes	8,0	8,0	Yes
5	Too much emphasis was placed on the responsibilities of government departments and very little emphasis was placed on the responsibilities of the clients who access services.	8,5	8,0	Yes	8,5	8,0	Yes	8,5	8,0	Yes
6	Service standards were sometimes unachievable, thus leading to clients having exaggerated expectations regarding how soon the service could be rendered.	8,0	8,0	Yes	8,0	8,0	Yes	8,0	8,0	Yes
7	Members of staff were often uninformed regarding their departments service standards and were therefore unaware of whether services were delivered to the standards set by their department.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
8	Certain departments had rigid and uniform service standards across the whole department, which took no account of local (urban vs. rural) or service variations.	9,0	9,5	Yes	9,0	9,5	Yes	9,0	9,5	Yes
9	Little understanding within some departments that considerable effort is required, beyond simply defining service standards, to implement the concept.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
10	Not linking the concept of service standards to current initiatives to reform the public service in South Africa such as the eight Batho Pele principles.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
No.	SCM Public Procurement Challenges									
1	Lack of proper knowledge, skills and capacity from public servants.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
2	Non-compliance with SCM policy and regulations.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
3	Inadequate planning and linking of demand to the budget.	9,0	9,5	Yes	9,0	9,5	Yes	9,0	9,5	Yes
4	Accountability, fraud and corruption.	9,0	9,5	Yes	9,0	9,5	Yes	9,0	9,5	Yes
5	Inadequate monitoring and evaluation of SCM	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
6	Too much decentralisation of the procurement system.	9,0	9,5	Yes	9,0	9,5	Yes	9,0	9,5	Yes
7	Ineffectiveness of the black economic empowerment (BEE) policy.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
No.	IDMS, SIPDM & FIDPM									
1	National Treasury's Infrastructure Delivery Management System (IDMS) as a model for best practice delivery of infrastructure management within the public sector.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
2	National Treasury's Standard for Infrastructure Procurement and Delivery Management (SIPDM) in support of the supply chain for infrastructure procurement and delivery management to all departments, constitutional institutions and public entities.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
3	National Treasury Instruction No.3 of 2019/2020 which repealed the SIPDM effective from 01 st October 2019 and gave legal effect to the Framework for Infrastructure Delivery and Procurement Management (FIDPM).	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
No.	Government Ability to Apply the FIDPM									
	Principles									
1	Broad ownership.	7,0	7,0	No						
2	Policy consistency.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
3	Planning alignment.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
4	Clarity of responsibility and accountability.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes

5	Evidence-based decision making.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
6	Continuous improvement and scalability (structured to assist all).	9,0	9,5	Yes	9,0	9,5	Yes	9,0	9,5	Yes
7	Continuous capacity and capability building.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
Benefits										
8	Understanding of delivery and procurement management processes including governance obligations.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
9	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
10	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
11	Identification of appropriate delivery options.	6,0	6,0	No						
12	Development of programme plans, using simple templates and guides.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
13	Alignment of the allocated budgets to infrastructure programmes.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
14	Identification and prioritisation of projects.	6,0	6,0	No						
15	Improved operations and maintenance management.	6,0	6,0	No						
16	Improved management of the procurement of supplies, services and engineering and construction works.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
17	Improved management of the planning and design of projects.	6,0	6,0	No						
18	Improved management of procurement and project delivery processes.	6,0	6,0	No						
19	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
20	Good practice guidelines, within a simple structured system, based upon well-defined processes that are necessary to achieve effective infrastructure delivery.	6,0	6,5	No						
21	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8,5	8,5	Yes	8,5	8,5	Yes	8,5	8,5	Yes
22	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
23	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
24	Senior management will have a tool to hold delivery managers accountable for performance.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
25	Reporting of progress, performance and impact will be uniformly documented.	6,0	6,0	No						
26	The quality and value for money of service delivery will improve.	8,5	8,5	Yes	8,5	8,5	Yes	8,5	8,5	Yes

Table 8.17: Summary of the Three Delphi Survey Rounds – PM Tools and Techniques

DELPHI STUDY - ROUNDS 1, 2 & 3		ROUND 1			ROUND 2			ROUND 3		
		Importance Median	Impact Median	Consensus Achieved	Importance Median	Impact Median	Consensus Achieved	Importance Median	Impact Median	Consensus Achieved
Section 3: PM Tools and Techniques										
No.	PM Attributes									
1	Ability to select and develop an operational team from a standing start.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
2	Leadership and management ability.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
3	Ability to anticipate problems, solve problems and make decisions.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
4	Ability to integrate project stakeholders.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
5	Operational flexibility.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes

6	Ability to plan, expedite and get things done.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
7	Ability to negotiate and persuade.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
8	Understand the environment within which the project is being managed.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
9	Ability to review, monitor and apply control.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
10	Ability to administer the contract, the scope of work and scope changes.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
11	Ability to manage within the environment of constant change.	9.5	9.5	Yes	7,0	7,0	No			
12	The ability to keep the client happy.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
No.	Effective Ways of Introducing Change									
1	Defining what has to be accomplished, generally in terms of time, cost and various technical and quality performance parameters.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
2	Developing a plan to achieve these and then working this plan, ensuring that progress is maintained in line with these objectives.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
3	Using appropriate project management techniques and tools to plan, monitor and maintain progress.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
4	Employing persons skilled in project management, including normally a project manager, who are given responsibility for introducing the change and are accountable for its successful accomplishment.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
No.	Key Skill Sets of Effective PM's									
1	Technical Project Management - The knowledge, skills and behaviours related to specific domains of project.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
2	Leadership - The knowledge, skills and behaviours needed to guide, motivate and direct a team.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
3	Strategic and Business Management - The knowledge of and expertise in the industry and organisation.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
No.	Ten PM Areas of Expertise and Service Delivery Challenges									
1	Political issues.	9,0	9,0	Yes	7,0	6.5	No			
2	Policy issues.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
3	Implementation issues.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
4	Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
5	Acute problems of institutional capacity.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
6	Mismanagement of funds.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
7	High levels of corruption.	8,0	8,0	Yes	7,0	7,0	No			
8	A lack of public participation.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
9	Absence of people centred culture and lack of objectives in the public service.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
10	Training and development programmes not being underpinned by people first values.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
11	Lack of effective monitoring and evaluation mechanisms internally and externally.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
12	Strategic planning activities on service delivery are limited to senior management.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
13	Poor site management from public servants.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
14	Time and cost variations.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
15	Skills and competency issues.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
No.	Key Institutional Goals									
1	To be more responsive and relevant to the needs of citizens.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
2	To be more efficient and effective in the use of public resources.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
3	To be more representative of the diversity and needs of all, especially the most disadvantaged sectors of society.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
4	To improve access to services, make them more responsive to the needs of citizens.	9.5	9.5	Yes	9.5	9.5	Yes	9.5	9.5	Yes
5	To be more flexible and more efficient in the use of allocated funding.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
6	To remove the command/ control approach of management and accompanying excess regulation.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes

7	To have the ability to adjust policies and processes when societal problems are detected.	10,0	10,0	Yes	10,0	10,0	Yes	10,0	10,0	Yes
8	To better utilise technology in the delivery of services.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
9	To remove public/ private sector competition and promote partnerships.	8,0	8,0	Yes	7,0	7,0	No			
No.	Application of IDM Toolkits Principles and Benefits by PM's									
Principles										
1	Broad ownership.	7,0	7,0	No						
2	Policy consistency.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
3	Planning alignment.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
4	Clarity of responsibility and accountability.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
5	Evidence-based decision making.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
6	Continuous improvement and scalability (structured to assist all).	9,0	9,5	Yes	9,0	9,5	Yes	9,0	9,5	Yes
7	Continuous capacity and capability building.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
Benefits										
8	Understanding of delivery and procurement management processes including governance obligations.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
9	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
10	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
11	Identification of appropriate delivery options.	6,0	6,0	No						
12	Development of programme plans, using simple templates and guides.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
13	Alignment of the allocated budgets to infrastructure programmes.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
14	Identification and prioritisation of projects.	6,0	6,0	No						
15	Improved operations and maintenance management.	6,0	6,0	No						
16	Improved management of the procurement of supplies, services and engineering and construction works.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
17	Improved management of the planning and design of projects.	6,0	6,0	No						
18	Improved management of procurement and project delivery processes.	6,0	6,0	No						
19	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
20	Good practice guidelines, within a simple structured system, based upon well-defined processes that are necessary to achieve effective infrastructure delivery.	6,0	6,5	No						
21	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8,5	8,5	Yes	8,5	8,5	Yes	8,5	8,5	Yes
22	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
23	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
24	Senior management will have a tool to hold delivery managers accountable for performance.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
25	Reporting of progress, performance and impact will be uniformly documented.	6,0	6,0	No						
26	The quality and value for money of service delivery will improve.	8,5	8,5	Yes	8,5	8,5	Yes	8,5	8,5	Yes
No.	Implementation of IDM Toolkits Principles and Benefits in FIDPM Work Stages									
Principles										
1	Broad ownership.	7,0	7,0	No						
2	Policy consistency.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
3	Planning alignment.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
4	Clarity of responsibility and accountability.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes

5	Evidence-based decision making.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
6	Continuous improvement and scalability (structured to assist all).	9,0	9,5	Yes	9,0	9,5	Yes	9,0	9,5	Yes
7	Continuous capacity and capability building.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
Benefits										
8	Understanding of delivery and procurement management processes including governance obligations.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
9	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
10	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
11	Identification of appropriate delivery options.	6,0	6,0	No						
12	Development of programme plans, using simple templates and guides.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
13	Alignment of the allocated budgets to infrastructure programmes.	9,5	9,5	Yes	9,5	9,5	Yes	9,5	9,5	Yes
14	Identification and prioritisation of projects.	6,0	6,0	No						
15	Improved operations and maintenance management.	6,0	6,0	No						
16	Improved management of the procurement of supplies, services and engineering and construction works.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
17	Improved management of the planning and design of projects.	6,0	6,0	No						
18	Improved management of procurement and project delivery processes.	6,0	6,0	No						
19	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
20	Good practice guidelines, within a simple structured system, based upon well-defined processes that are necessary to achieve effective infrastructure delivery.	6,0	6,5	No						
21	Greater level of uniformity of infrastructure project implementation, across different organs of state.	8,5	8,5	Yes	8,5	8,5	Yes	8,5	8,5	Yes
22	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
23	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
24	Senior management will have a tool to hold delivery managers accountable for performance.	9,0	9,0	Yes	9,0	9,0	Yes	9,0	9,0	Yes
25	Reporting of progress, performance and impact will be uniformly documented.	6,0	6,0	No						
26	The quality and value for money of service delivery will improve.	8,5	8,5	Yes	8,5	8,5	Yes	8,5	8,5	Yes

8.3.4 Ranking of Factors

The Delphi survey aimed at identifying the key drivers of the public sector, government policies, frameworks and the FIDPM including PM tools and techniques that were deemed to be important and have a high impact for improving public service delivery. The Delphi survey was concluded after three rounds and the sub-factors that did not achieve consensus were eliminated. Tables 8.15 – 8.17 indicated there were 46 sub-factors under seven unobserved variables for the public sector driver, 39 sub-factors were under five unobserved variables for the government policies, frameworks and the FIDPM driver and finally 75 sub-factors were under seven unobserved variables for the PM tools and techniques driver. The total of 160 sub-factors were grouped under 19 unobserved variables which were finally grouped into three main drivers. Table 8.18 presents the ranking of the factors.

Table 8.18 Ranking the Importance and Impact of all Factors

RANKING OF FACTORS		Importance		Impact	
		Mean	Rank	Mean	Rank
1: Public Sector (46 sub-factors under 7 unobserved variables)					
1	Recurring Problems in the Public Sector	9.0	6	9.0	5
2	Public Service Transformation Strategies	9.1	5	9.1	4
3	Areas for Improved Efficiency and Effectiveness for Transforming Service Delivery	8.9	7	8.9	6
4	Batho Pele Principles	9.5	2	9.5	2
5	Service Delivery Challenges	9.3	3	9.5	2
6	Government Processes and Decision Making	9.8	1	9.7	1
7	Management Strategies for Service Delivery	9.2	4	9.2	3
2: Government Policies, Frameworks and the FIDPM (39 sub-factors under 5 unobserved variables)					
1	Policy Development and Implementation	9.8	1	9.8	1
2	Effective Policy Implementation	8.8	4	8.8	4
3	SCM Public Procurement Challenges	9.1	3	9.4	2
4	IDMS, SIPDM & FIDPM	9.3	2	9.3	3
5	Government Ability to Apply the FIDPM	8.3	5	8.3	5
3: PM Tools and Techniques (75 sub-factors under 7 unobserved variables)					
1	PM Attributes	8.6	4	8.6	4
2	Effective Ways of Introducing Change	7.3	5	7.3	5
3	Key Skill Sets of Effective PM's	9.0	3	9.0	3
4	Ten PM Areas of Expertise and Service Delivery Challenges	9.3	2	9.3	2
5	Key Institutional Goals	9.8	1	9.8	1
6	Application of IDM Toolkits Principles and Benefits by PM's	8.1	6	8.1	6
7	Implementation of IDM Toolkits Principles and Benefits in FIDPM Work Stages	8.1	6	8.1	6

8.3.4.1 Public Sector

The South African government has been accountable for inadequate service delivery to citizens on numerous occasions, emphasising inequality and problems in the public sector (Fakir, 2014 and Beukes, 2014). The results from Table 8.18 illustrates, expert panellists are concerned with “*government processes and decision making*” as it was ranked the most important factor with the highest impact, with “*Batho Pele principles*” being rated the second in terms of importance and impact, suggesting government are not adhering to the principles set out under Batho Pele. Expert panellists ranked “*recurring problems in the public sector*” and “*areas for improved efficiency and effectiveness for transforming service delivery*” the lowest, although still rated these very important with a high impact, highlighting them as problematic areas in the public sector, which directly impact the performance of improved service delivery.

This indicated that the Delphi study supports the need for the public sector driver to be investigated further through the national questionnaire, which was reinforced by the results of the panel of experts

in all three rounds. While the factors were ranked from highest to lowest, it is evident that all factors were key in terms of importance and impact as consensus was achieved on all seven observed variables.

8.3.4.2 Government Policies, Frameworks and the FIDPM

The South African government has through the years developed and implemented numerous policies and frameworks to facilitate service delivery in the construction industry (Khumalo *et al.* 2017). To date, there are still unresolved challenges (FIDPM, 2019; Ngcamu, 2019). Table 8.18 indicated the importance of project managers to possess knowledge, awareness application of government policies including how they are implemented, as they ranked “*policy development and implementation*” and “*IDMS, SIPDM & FIDPM*” were ranked as the most important factors with the highest impact. However, “*effective policy implementation*” and “*government ability to apply the FIDPM*” ranked the lowest but were still rated very high under importance and impact. This is critical as PMs cannot assist government with effective policy and framework implementation towards improved service delivery, without a comprehensive understanding of the mechanics of policy and framework operations.

8.3.4.3 PM Tools and Techniques

The main driver behind the application of project management in government is to improve state institution’s ability to deliver efficient, effective and high-quality services. Project management is able to support the achievement of institutional goals and provide greater assurance to stake holders regarding effective resource management as project managers vest responsibility, authority, and accountability (Srivannaboon and Milosevic, 2006; Thiry and Matthey, 2005). Table 8.18 depicted expert panellists ranked “*key institutional goals*” the most important factor with the highest impact suggesting it critical for PMs to implement these goals as they may assist towards improving service delivery. Interestingly the “*applications of IDM toolkits principles and benefits by PM’s*” and “*implementation of IDM toolkits principles and benefits in FIDPM work stages*”, although ranked the lowest, was still rated very important with high impact. This indicated expert panellists found the application and implementation of the IDM toolkits principals and benefits key areas for further investigation.

8.4 Chapter Summary

The Delphi study was implemented to ensure that a systematic approach was provided towards achieving consensus on 160 sub-factors under 19 factors grouped into three key drivers for improving service delivery. The results of the Delphi process revealed the public sector, government policies, frameworks and the FIDPM and PM tools and techniques were all important drivers for the effective implementation of service delivery and their impact in the South African public sector.

The public sector driver indicated that recurring problems are evident in the public sector. Public service transformation strategies need to be aligned by government. In addition, government initiatives are lacking. Batho Pele principles need to be adhered to, while service delivery challenges remain present. Government processes and decision-making hampers the progress of service delivery. Management strategies for service delivery must align to international best practice requirements. The government policies, frameworks and the FIDPM driver highlighted: policy development and implementation struggle with successful service delivery. Government requires effective policy implementation. Supply chain management as a strategic tool faces public procurement challenges. PMs need to be aware of the IDMS, SIPDM and FIDPM. Government needs to effectively implement the principles and benefits the IDMS offers through the implementation of the FIDPM.

Finally, the PM tools and techniques driver emphasised that PM attributes can assist government with the implementation of the FIPDM towards improving service delivery. PMs are in an opportune position to implement effective change towards assisting government improve service delivery on public sector projects. Key skill sets of effective project managers should be used to assist government improve service delivery on public sector projects. PMs can use their skills under the ten knowledge areas of expertise to assist government address service delivery challenges. PMs could assist government in achieving key institutional goals. PMs are able to apply the IDM toolkits principals in order to achieve the benefits through the FIDPM. The implementation of the IDM toolkits principals and benefits need to be effectively implemented by government during FIDPM work stages.

CHAPTER 9 – DATA ANALYSIS

9.1 Introduction

This chapter presents the data analysis of the questionnaire on the Public Sector, FIDPM and PM Tools and Techniques drivers that could potentially improve service delivery implementation in the public sector. The data was analysed as follows:

- Reliability testing (Cronbach Alpha), descriptive data analysis, and
- Multivariate data analysis entailing exploratory factor analysis (EFA, confirmatory factor analysis (CFA) and structural equation modelling (SEM).

Descriptive statistics entail measures of frequency (frequency and percent), measures of central tendency (mean, median and mode) including measures of dispersion (variance, standard deviation) while Standard Deviation (SD) measures how spread the data values are from the mean. (Mishra *et al.* 2019). The descriptive statistics were analysed using SPSS Version 27 and is presented under the three drivers, namely, the public sector, government policies, frameworks and the FIDPM and, project management tools and techniques. The indicators under each observed variable were ranked against their mean values and were then discussed, and comparisons were made against the literature.

Estimation methods for Path/ SEM assume multivariate normality. Standard normal distribution entails a bell-shaped curve which are described by the mean and standard deviation where extreme data values have minimal impact on the mean value (Bell, Bryman and Harley, 2019; Mishra *et al.* 2019). However, there are two ways that distribution may be non-normal, these are skewness and kurtosis. Non-normal data entails extreme values in either measure of skewness and kurtosis (Blanca, Alarcon, Arnua, Bono and Bendayan, 2017; Mishra *et al.* 2019).

Skewness measures the lack of symmetry and can be positive or negative.

- *Positive skewness* – indicates the tail on the right side of the bell curve is longer or flatter (mean and median is greater than the mode) while,
- *Negative skewness* – occurs when the tail on the left side is longer or flatter (mean and median is less than the mode) (Bell *et al.* 2019).

Data distribution between -0.5 and 0.5 is regarded as symmetrical. However, data between -1 and -0.5 is moderately skewed and data less than -1 or more than 1 is highly skewed (Bell *et al.* 2019; Mishra *et al.* 2019; Orcan, 2020).

Kurtosis measures peakedness of the distribution is measured in three categories, namely:

1. *Mesokurtic* – where distribution is normal, i.e.: the extreme value of distribution is similar to the normal distribution.
2. *Leptokurtic* – occurs when distribution is greater than mesokurtic distribution. In addition, leptokurtic distribution is a consequence of outliers.
3. *Platykurtic* – distribution that occurs when the extreme values are less than the mesokurtic distribution, caused through a scarcity of outliers (Bell *et al.* 2019)

Authors such as Bell *et al.* (2019), Blanca *et al.* (2017), Cain *et al.* (2017) and Mishra *et al.* (2019) note that extreme values are greater +3 or less than -3 for skewness and kurtosis. Although for sample sizes greater than +300 an absolute skewness value less than 2 and an absolute kurtosis less than 4 may be used as reference values for determining normality. Skewness and kurtosis values are presented and discussed under the descriptive analysis section.

Multivariate data analysis entailing EFA, CFA and SEM was conducted for the data analysis.

EFA was used to assist in the representation of a large number of relationships among normally distributed variables in a parsimonious way and was directed at understanding the relations among variables through understanding the constructs that underlie them (Pallant, 2020; Tabachnick and Fidell, 2019). EFA further assesses the level of construct validity in a data set regarding a measure purported to measure certain constructs. In addition, EFA involved postulating that there is a set of smaller of unobserved variables or constructs (Pallant, 2020; Tabachnick and Fidell, 2019).

CFA is usually conducted after EFA as it is a complex and sophisticated technique which entails the test of specific models of how variables are related to underlying constructs and was conducted through Amos Version 26 (Pallant, 2020). CFA further bridges EFA with SEM, as SEM entails models where casual relationships are investigated between latent variables. While CFA tests whether the hypotheses have a relationship between the observed variables and underlying unobserved constructs known as a good fit to the data (Tabachnick and Fidell, 2019).

9.2 Descriptive Data Analysis

The national questionnaire was distributed to 1185 professionally registered construction project managers with the South African Council for Project and Construction Management Profession (SACPCMP) through a stratified random sampling approach. Four hundred and ten responses were received representing 34.59% response rate and the data was analysed using IBM SPSS v27.

9.2.1 Reliability Analysis – Cronbach Alpha

Cronbach Alpha was conducted to check for internal consistency and ensure reliability of the data. Cronbach’s Alpha is .967 of 160 items for a total number of 410 respondents. According to authors like Bell *et al.* (2019), Sekaran and Bougie (2017), Cronbach Alpha should be greater than 0.6. While Ursachi, Hordnic and Zait (2015: 681) indicated that “a general accepted rule is that α of 0.6-0.7 indicates an acceptable level of reliability, and 0.8 or greater a very good level”. It can therefore be argued that the reliability test implies a strong internal consistency as 0.967 is far above 0.6., regardless of differing views that values higher than 0.95 are not necessarily good as they might be an indication of redundancy (Hulin, Netemeyer, and Cudeck, 2001).

The next section discusses the results of the survey questionnaire.

9.2.2 Demographic Information

The racial distribution of the respondents is presented in Table 9.1. Fifty-three percent of respondents were white while the balance of other races was distributed between Indian (20.2%), African (13.7%) and Coloured (12.2%). The racial and gender distribution of respondents illustrated 388 male respondents, and 22 female responds. In addition, 55% of male respondents were White and 10% Coloured whereas, 36% of female respondents were Coloured and 9% African. The age category of respondents depicted that the highest responsive age categories were, above 50 years (43.9%) and 31-40 years (39.5%). Only one respondent representing 0.3% was from the category 20-30 years. The gender distribution of respondents highlighted 94% were male, and 22 respondents (5.4%) were female. While the years of experience respondents have working on public sector construction projects indicated, 42% of respondents have more than 30 years of experience with 38% having 20-30 years of experience. Only one respondent had between 05-10 years of experience indicating that the questionnaire was answered by a predominately experienced sample population.

Table 9.1: Demographic Information Summary

Category	Race	Frequency		Percent	
Racial description of respondents	White	221		53.9%	
	Indian	83		20.2%	
	African	56		13.7%	
	Coloured	50		12.2%	
	Total	410		100.0%	
Racial and gender distribution of respondents		Male		Female	
	Race	Frequency	Percent	Frequency	Percent
	White	215	55.4%	6	27.3%
	Indian	77	19.8%	6	27.3%
	African	54	13.9%	2	9.1%
	Coloured	42	10.8%	8	36.4%
	Total	388	100.0%	22	100.0%
Age of respondents	Age	Frequency		Percent	
	20 - 30 Years	1		0.3	
	31 - 40 Years	162		39.5	

	41 - 50 Years	67	16.3
	Above 50 Years	180	43.9
	Total	410	100.0
Gender of respondents	Gender	Frequency	Percent
	Male	388	94.6%
	Female	22	5.4%
	Total	410	100.0%
Experience in public sector construction projects	Experience	Frequency	Percent
	05 - 10 Years	1	0.3%
	10 - 20 Years	79	19.3%
	20 - 30 Years	156	38.0%
	Above 30 Years	174	42.4%
	Total	410	100.0%

The frequency of respondents working on public sector construction projects is depicted in Table 9.4. Eighty-nine percent of respondents indicated that they always work on public sector construction projects. The sector of employment distribution of respondents illustrated a total of 374 respondents were employed in the private sector as either consultant or contractor. Eight percent of respondents were employed in the public sector under a government department.

In addition, Table 9.2 illustrates that responses were received from all three targeted provinces. Twenty-eight percent of respondents were involved in infrastructure projects in Gauteng (Johannesburg), KwaZulu-Natal (EThekwini) and Cape Town, while 19% were involved in projects in Gauteng (Johannesburg), KwaZulu-Natal (EThekwini and Msunduzi) and Cape Town. Only nine (2%) of respondents were involved on infrastructure projects in Gauteng (Johannesburg, Tshwane, and Ekurhuleni).

Table 9.2: Employment Sector and Geographic Dispersion

Category	Scale	Frequency	Percent
Frequency of executing public sector construction projects	Seldom	18	4.4%
	Often	27	6.6%
	Always	365	89.0%
	Total	410	100.0%
Current sector of employment	Sector	Frequency	Percent
	Public Sector (Government Official)	36	8.8%
	Private Sector (Consultant/Contractor)	374	91.2%
	Total	410	100.0%
Distribution of provinces and cities involved in infrastructure projects	Province & City	Frequency	Percent
	Gauteng (Johannesburg, Tshwane, and Ekurhuleni), KwaZulu-Natal (EThekwini)	39	9.5%
	Gauteng (Johannesburg, Tshwane, and Ekurhuleni), KwaZulu-Natal (EThekwini) and Cape Town	59	14.4%
	Gauteng (Johannesburg) and Cape Town	23	5.6%
	Gauteng (Johannesburg), KwaZulu-Natal (EThekwini) and Cape Town	115	28.0%
	Gauteng (Johannesburg), KwaZulu-Natal (EThekwini and Msunduzi) and Cape Town	78	19.0%
	Gauteng (Johannesburg), KwaZulu-Natal (EThekwini)	26	6.3%
	Gauteng (Johannesburg, Tshwane, and Ekurhuleni)	9	2.2%
	Gauteng (Johannesburg and Ekurhuleni), Cape Town	14	3.4%
KwaZulu-Natal (EThekwini)	11	2.7%	

	Gauteng (Johannesburg, Tshwane, and Ekurhuleni), KwaZulu-Natal (EThekweni and Msunduzi) and Cape Town	36	8.8%
	Total	410	100.0%

Respondents experience with public sectors efficiency and effectiveness towards providing public goods and services indicated that 75% experienced poor efficiency and effectiveness from public sector and 21% highlighted their experience as very poor. Fourteen respondents had an average experience regarding the provision of public goods and services from public sector. Table 9.3 presents the racial distribution and experience of respondents. Seventy percent of respondents with more than 30 years of experience were White. In addition, 59% of respondents with 20-30 years of experience were also White and 31% were Coloured. However, 51% of respondents with 10-20 years of experience were Indian and 40% were African.

Table 9.3: Racial distribution and experience of respondents

Race	05 - 10 Years		10 - 20 Years		20 - 30 Years		Above 30 Years	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
White	1	100.0%	5	6.3%	93	59.6%	122	70.1%
Indian	0	0.0%	41	51.9%	1	0.6%	41	23.6%
African	0	0.0%	32	40.5%	13	8.3%	11	6.3%
Coloured	0	0.0%	1	1.3%	49	31.4%	0	0.0%
Total	1	100.0%	79	100.0%	156	100.0%	174	100.0%

9.2.3 The Public Sector

Tables 9.4 – 9.10 depicted the Likert scale analysis of the public sector driver, which needed to be investigated to identify government efforts and initiatives towards service deliver including the challenges hindering service delivery. The driver lists seven unobserved variables and 46 indicators depicted in Figure 9.1. The mean values were ranked and presented as follows:

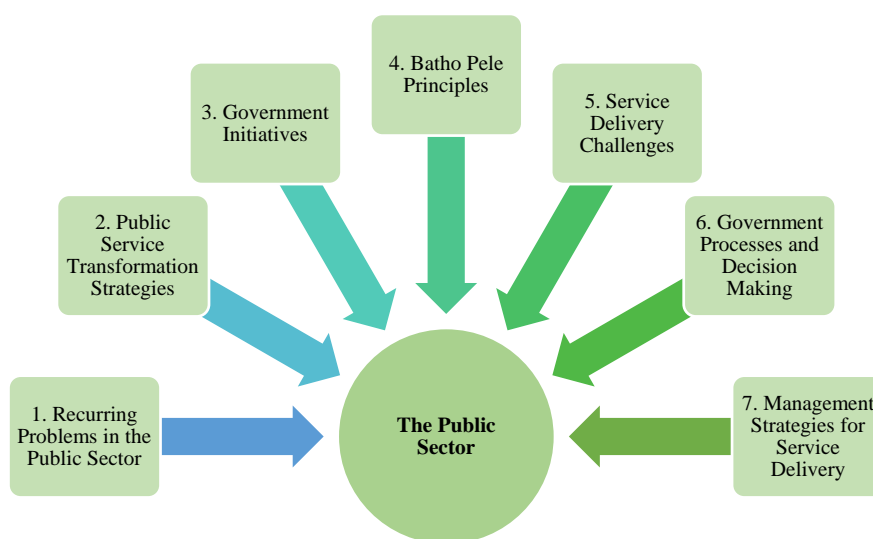


Figure 9.1. The Public Sector

1. Recurring Problems in the Public Sector

Fourie and Poppenpoel (2016) indicated that there is a consistent recurrence of problems in the South African public sector. In addition, Akinboade *et al.* (2012), Francis (2013) and Janse van Rensburg (2014) further highlight poor human resource practices and lack of accountability hinder service delivery. Table 9.4 illustrated whether recurring problems in the public sector are still present.

Respondents ranked item RPPS2 “*resource optimisation...*” (m = 4.93) first with 93.7% strongly agreeing that resource optimisation, accountability and a non-compliance culture are still fundamental problems areas in the public sector, while only 1% were neutral. Table 9.4 further indicated that 386 respondents strongly agreed with item RPPS3 “*the root causes of problems...*” and a further 378 respondents strongly agreed with item RPPS1 “*resource optimisation...*” as the mean values were relatively close to the median value (5), emphasising these are still serious problems. The results suggest government need to pursue the root cause analysis towards identifying and addressing consistently recurring public sector challenges as these are hindering service delivery.

Table 9.4: Recurring Problems in the Public Sector

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
RPPS2	Resource optimisation, accountability and a non-compliance culture seem to be the main problem areas in the public sector.	N	0%	0%	4	22	384	410	4.93	.296	1
		%	0.0%	0.0%	1.0%	5.4%	93.7%					100.0%
RPPS3	The root causes of problems are not being adequately addressed.	N	0%	0%	13	11	386	410	4.91	.382	2
		%	0.0%	0.0%	3.2%	2.7%	94.1%					100.0%
RPPS1	Consistent recurrence of findings.	N	0%	0%	7	25	378	410	4.90	.347	3
		%	0.0%	0.0%	1.7%	6.1%	92.2%					100.0%

2. Public Service Transformation Strategies

Respondent’s experiences with government on public sector projects were explored in Table 9.5 which depicted whether government is aligned to the aims of the strategies highlighted by the White Paper on Transformation of the Public Service.

Government is guided by the ideals of the Constitution for public service and is further supported by the White Paper on the Transformation of the Public Service which promotes the definite need to develop strategies for continuous improvement of service delivery (White Paper on Transforming Public Service Delivery, 1997). Table 9.5 depicted that 53.9% of respondents had poor experiences with item PSTS2 “*identify services and target populations...*” with a mean value of 1.92 while 79 respondents had an average experience. This is a critical issue for government to address as the public sector struggles to identify and prioritise target populations in need of affordable service delivery. No

respondents had any good or excellent experiences with governments alignment to public service transformation strategies. It was surprising to see item PSTS5 “develop a culture of customer care...” rank second (m=1.73) highlighting the severity of governments misalignment to this item as government would be expected to treat customer care during the delivery of services as a priority for its citizens. The results in Table 9.5 indicate government is still not aligned to the aims of the White Paper on the Transformation of the Public Service.

Table 9.5: Public Service Transformation Strategies

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Very Poor	Poor	Average	Good	Excellent				
PSTS2	Identify services and target populations for services with emphasis on affordability and redress	N	110	221	79	0	0	410	1.92	.676	1
		%	26.8%	53.9%	19.3%	0.0%	0.0%	100.0%			
PSTS5	Develop a culture of customer care and context and client sensitive service delivery	N	111	297	2	0	0	410	1.73	.453	2
		%	27.1%	72.4%	0.5%	0.0%	0.0%	100.0%			
PSTS1	Generate mission statements for service delivery linked to service guarantees	N	133	275	2	0	0	410	1.68	.477	3
		%	32.4%	67.1%	0.5%	0.0%	0.0%	100.0%			
PSTS3	Set definite service standards, define outputs and targets and determine performance indicators benchmarked against international standards	N	132	276	2	0	0	410	1.68	.476	3
		%	32.2%	67.3%	0.5%	0.0%	0.0%	100.0%			
PSTS4	Manage service delivery by means of sound human and financial resource management in partnerships with the private sector, nongovernmental organisations, and the community	N	206	201	3	0	0	410	1.50	.515	4
		%	50.2%	72.4%	0.5%	0.0%	0.0%	100.0%			

3. Government Initiatives

Government initiatives towards building a platform for the growth of public services was examined in Table 9.6.

In South Africa, improving service delivery is critical for growing and developing the economy (Fourie, 2014). The South African Constitution further emphasises failure to provide these services would result in a violation of the right to have access to basic services and a better life (Crous, 2004; Mashamaite, 2014; Nengwakhulu, 2009; Wilson, 2012). However, Janse van Rensburg (2014) reinforced that government lacks accountability. Table 9.6 highlighted that all 410 respondents indicated that item GI8 “accountability” was very poorly experienced when engaging with government. It is critical for government adopt a culture of accountability in the public sector towards ensuring public sector employees are held accountable for their actions when implementing service delivery. Without accountable public servants, responsibility diminishes and directly impacts the delivery of services negatively (Janse van Rensburg, 2014). In addition, 321 respondents (78.3%) experience with item GI1 “Suitable infrastructure and logistics” was very poor (m = 1.22), while only 0.5% of respondents had

an average experience. This is a critical problem for government as adequate infrastructure and logistics are imperative towards ensuring successful service delivery. Table 9.8 illustrated, building a platform for future growth remains a challenge for government as their service delivery initiatives were poorly experienced respondents.

Table 9.6: Government Initiatives

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Very Poor	Poor	Average	Good	Excellent				
*GI8	Accountability.	N	410	0	0	0	0	410	3.00	.000	1
		%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%			
GI1	Suitable infrastructure and logistics.	N	321	87	2	0	0	410	1.22	.428	2
		%	78.3%	21.2%	0.5%	0.0%	0.0%	100.0%			
GI9	Improving Performance Management.	N	329	81	0	0	0	410	1.20	.399	3
		%	80.2%	19.8%	0.0%	0.0%	0.0%	100.0%			
GI4	Innovation and partnerships.	N	373	34	3	0	0	410	1.10	.321	4
		%	91.0%	8.3%	0.7%	0.0%	0.0%	100.0%			
GI6	Effective government offerings.	N	373	37	0	0	0	410	1.09	.287	5
		%	91.0%	9.0%	0.0%	0.0%	0.0%	100.0%			
GI7	Equitability.	N	396	2	12	0	0	410	1.06	.344	6
		%	96.6%	0.5%	2.9%	0.0%	0.0%	100.0%			
GI2	Competitive input prices.	N	389	17	4	0	0	410	1.06	.277	6
		%	94.9%	4.1%	1.0%	0.0%	0.0%	100.0%			
GI3	Skills and technology.	N	394	14	2	0	0	410	1.04	.228	7
		%	96.1%	3.4%	0.5%	0.0%	0.0%	100.0%			
GI5	Efficient regulation.	N	394	37	0	0	0	410	1.04	.228	7
		%	91.0%	9.0%	0.0%	0.0%	0.0%	100.0%			

4. Batho Pele Principles

The literature presented eight core principles that Batho Pele is based on. Table 9.7 examined how often respondents experienced government implementing and adhering to these principles.

The performance outcomes reported by the PSC (2000), Batho Pele Policy Review (2003), PSC (2008) and DPSA (2018) highlight poor implementation of Batho Pele principals on public sector projects. It was important to note that 81.2% of respondents seldomly experienced government implementing item BPP4 “*access – all citizens should have equal access to services*” which had a mean value of 1.90 and a further 59 respondents indicated they never experienced this principle at all. This emphasised that the current state of service delivery is lacking as citizens do not have equal access to services. Although 71.4% of respondents indicated they never experienced government adhering to item BPP3 “*Redress – all citizens should be offered an apology and solution when standards are not met*” (m = 1.44) and only 14.9% noted that it was sometimes adhered to. This suggests government needs to focus on improving how it addresses citizens when service delivery standards are not met. It is important that government cares for the needs of its citizens and not ignore them, as citizens are customers of public service (White

Paper on Transforming Public Service Delivery, 1997). Table 9.7 further illustrated respondents had dismal experiences with implementation of Batho Pele principals on public sector projects.

Table 9.7: Batho Pele Principles

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Never	Seldom	Sometimes	Often	Always				
BPP4	Access – all citizens should have equal access to services.	N	59	333	18	0	0	410	1.90	.422	1
		%	14.4%	81.2%	4.4%	0.0%	0.0%	100.0%			
BPP8	Value for Money – all services provided should offer value for money.	N	58	339	13	0	0	410	1.89	.402	2
		%	14.1%	82.7%	3.2%	0.0%	0.0%	100.0%			
BPP5	Courtesy – all citizens should be treated courteously.	N	59	345	6	0	0	410	1.87	.377	3
		%	14.4%	84.1%	1.5%	0.0%	0.0%	100.0%			
BPP6	Information – all citizens are entitled to full, accurate information.	N	59	345	6	0	0	410	1.87	.377	3
		%	14.4%	84.1%	1.5%	0.0%	0.0%	100.0%			
BPP7	Openness and Transparency – all citizens should know how decisions are made and departments are run.	N	92	312	6	0	0	410	1.79	.442	4
		%	22.4%	76.1%	1.5%	0.0%	0.0%	100.0%			
BPP2	Standards – all citizens should know what service to expect.	N	116	278	16	0	0	410	1.76	.513	5
		%	28.3%	67.8%	3.9%	0.0%	0.0%	100.0%			
BPP1	Consultation – citizens should be consulted about their needs.	N	264	56	90	0	0	410	1.58	.828	6
		%	64.4%	13.7%	22.0%	0.0%	0.0%	100.0%			
BPP3	Redress – all citizens should be offered an apology and solution when standards are not met.	N	291	58	61	0	0	410	1.44	.738	7
		%	71.0%	14.1%	14.9%	0.0%	0.0%	100.0%			

5. Service Delivery Challenges

A critical area hampering service delivery in South Africa is explored in Table 9.8 which identified how often respondents experienced service delivery challenges on public sector projects.

The South African government has had to play catch up in dealing with disparities of the past. Various authors such as Burger (2009), Visser (2012), Masiya *et al.* (2019) and Manyathi *et al.* (2021) have stressed various challenges facing service delivery. Items SDC5 “acute problems of institutional capacity” and SDC6 “mismanagement of funds” shared a mean value of 4.81 indicating 347 (84.6%) of respondents always encountered institutional capacity problems and 351 (85.6%) always experienced mismanagement of funds. The results stress the importance of government taking these challenges seriously, as lacking institutional capacity coupled with mismanagement of funds is a disastrous combination for public service delivery. The construction industry suffers from public service skills shortages that affect the capacity of the industry and the public sector in terms of project delivery (CIDB, 2017). Items SDC13 “poor site management...” and SDC15 “skills and competency issues” had mean values relatively close to 5 (m = 4.27), 72.9% of respondents highlighted they were often experienced. This stressed that the differing levels of skills in the industry directly result in poor performance concerning public sector projects (CIDB, 2017). Table 9.8 further exemplifies service delivery challenges are still evident and government urgently needs to be addressed.

Table 9.8: Service Delivery Challenges

Item No.	Description	N	1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Never	Seldom	Sometimes	Often	Always				
SDC5	Acute problems of institutional capacity.	N	0	0	14	49	347	410	4.81	.470	1
		%	0.0%	0.0%	3.4%	12.0%	84.6%	100.0%			
SDC6	Mismanagement of funds.	N	0	0	19	40	351	410	4.81	.497	1
		%	0.0%	0.0%	4.6%	9.8%	85.6%	100.0%			
SDC3	Implementation issues.	N	0	0	18	44	348	410	4.80	.495	2
		%	0.0%	0.0%	4.4%	10.7%	84.9%	100.0%			
SDC2	Policy issues.	N	0	0	26	33	351	410	4.79	.540	3
		%	0.0%	0.0%	6.3%	8.0%	85.6%	100.0%			
SDC1	Political issues.	N	0	0	28	38	344	410	4.77	.560	4
		%	0.0%	0.0%	6.8%	9.3%	83.9%	100.0%			
SDC7	High levels of corruption.	N	0	0	17	75	318	410	4.73	.528	5
		%	0.0%	0.0%	4.1%	18.3	77.6%	100.0%			
SDC4	Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction.	N	0	0	11	92	307	410	4.72	.505	6
		%	0.0%	0.0%	2.7%	22.4%	74.9%	100.0%			
SDC11	Lack of effective monitoring and evaluation mechanisms internally and externally.	N	0	0	2	239	168	410	4.48	1.498	7
		%	0.0%	0.0%	0.5%	58.3%	41.0%	100.0%			
SDC8	A lack of public participation.	N	0	0	15	218	177	410	4.40	.559	8
		%	0.0%	0.0%	3.7%	53.2%	43.2%	100.0%			
SDC12	Strategic planning activities on service delivery are limited to senior management.	N	0	0	4	239	167	410	4.40	.510	8
		%	0.0%	0.0%	1.0%	58.3%	40.7%	100.0%			
SDC14	Time and cost variations.	N	0	0	0	268	142	410	4.35	.476	9
		%	0.0%	0.0%	0.0%	65.4%	34.6%	100.0%			
SDC10	Training and development programs not being underpinned by people first values.	N	0	0	21	229	160	410	4.34	.572	10
		%	0.0%	0.0%	5.1%	55.9%	39.0%	100.0%			
SDC9	Absence of people centered culture and lack of objectives in the public service.	N	0	0	19	240	151	410	4.32	.558	11
		%	0.0%	0.0%	4.6%	58.5%	36.8%	100.0%			
SDC13	Poor site management from public servants during construction.	N	0	0	0	299	111	410	4.27	.445	12
		%	0.0%	0.0%	0.0%	72.9%	27.1%	100.0%			
SDC15	Skills and competency issues.	N	0	0	0	299	111	410	4.27	.445	12
		%	0.0%	0.0%	0.0%	72.9%	27.1%	100.0%			

6. Government Processes and Decision Making

Government has been known to implement lengthy procedures coupled with the inability to expedite decisions timeously, which has not been in the best interest of citizens and has directly hampered service delivery (Public Service Commission Report, 2008; Schwella, 2001). Table 9.9 highlighted respondent's experiences with government processes and ability to make decisions regarding service delivery.

It was noted that 309 (74.4%) of respondents strongly agreed with item GPDM1 “*detailed regulation and central prescription...*” (m = 4.67), while 8.5% of respondents chose to remain neutral. This indicated government faces a serious problem of bureaucracy and lengthy procedures which are not in the interests of citizens and needs to be resolved if service delivery is to improve. No respondents

disagreed with the listed items. Table 9.11 further illustrated 74.9% of respondents strongly agreed with item GDPM3 “*implementing robust risk assessments...*” and 62.2% agreed with item GDPM2 “*service deliverers are currently...*” accentuating governments processes and decision making requires serious adjustment, development and improvement in order enhance public service delivery objectives.

Table 9.9: Government Processes and Decision Making

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
GPD1	Detailed regulation and central prescription in South Africa have resulted in excessive bureaucracy and lengthy procedures which are against the interests of customers, internal and external.	N	0	0	35	66	309	410	4.67	.627	1
		%	0.0%	0.0%	8.5%	16.1%	75.4%	100.0%			
GPD3	Implementing robust risk assessments and management processes at project inception to drive the decision-making process in procurement on public sector projects.	N	0	0	35	68	307	410	4.66	.628	2
		%	0.0%	0.0%	8.5%	16.6%	74.9%	100.0%			
GPD2	Service deliverers are currently forced to spend too much of their time trying to get decisions made and complying with central requirements, many of which hamper the delivery of services to the customer.	N	0	0	16	255	139	410	4.30	.537	3
		%	0.0%	0.0%	3.9%	62.2%	33.9%	100.0%			

7. Management Strategies for Service Delivery

New management strategies required to effect improvements in service delivery by government were examined in Table 9.10.

Globally, new management strategies entailed reorienting existing management strategies towards enhancing the way services are delivered (The World Bank, 2015). The South African public service has been identified in terms of legislature and policy, to be in alignment with international best practice requirements (Republic of South Africa, 1996). The responses in Table 9.10 indicated, 380 (92.7%) of respondents strongly agreed with item MSSD3 “*development of more results-oriented management systems*” (m = 4.90) while only 2.7% remained neutral. This illustrated the importance of government implementing performance measuring and reporting systems regarding service delivery targets which enables performance and reporting to be tracked. Without the ability to track performance and reporting, government will not be able to benchmark targeted future service delivery goals, nor will current achievements have a platform to be measured against (Schwella, 2001). The results for the remaining items depicted in Table 9.10 indicated respondents strongly agreed with items MSSD2 “*improvement of human resources...*” (84.1%) and MSSD1 “*development of more flexible...*” (72.4%) which reinforced, current strategies and systems require adjustment to align to international best practice requirements towards improving service delivery.

Table 9.10: Management Strategies for Service Delivery

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
MSSD3	Development of more results-oriented management systems.	N	0	0	11	19	380	410	4.90	.379	1
		%	0.0%	0.0%	2.7%	4.6%	92.7%	100.0%			
MSSD2	Improvement of human resource management systems.	N	0	0	34	31	345	410	4.76	.591	2
		%	0.0%	0.0%	8.3%	7.6%	84.1%	100.0%			
MSSD1	Development of more flexible regulatory frameworks.	N	0	0	11	102	297	410	4.70	.515	3
		%	0.0%	0.0%	2.7%	24.9%	72.4%	100.0%			

9.2.3.1 Summary of Findings – The Public Sector

The following findings for the public sector driver were summarised as follows:

1. Recurring problems are still evident in the public sector,
2. Public service transformation strategies are still not aligned by government,
3. Government initiatives are lacking,
4. Batho Pele principles are not being implemented or adhered to,
5. Service delivery challenges are still present,
6. Government processes and decision making are hampering the progress of service delivery,
7. Management strategies for service delivery require adjustment to align to international best practice requirements.

9.2.3.2 Skewness and Kurtosis

The descriptive statistics of the public sector driver illustrated that some of the items displayed severe skewness although most items displayed negative skewness. In addition, some of the items displayed extreme levels of kurtosis indicating the presence of outliers. Item *GI8 “accountability” under Government Initiatives was removed from the data analysis as the standard deviation was equal to zero, (Table in Appendix H). This was a result of the responses for all respondents being equal, the term $(x_i - x)^2 = 0$. Every data value was equal to the mean. The result for this item indicated that all its values are identical. The data set therefore indicated non-normally distributed data which required caution and robust maximum likelihood estimation to be implemented.

9.2.4 Government Policies, Frameworks and the FIDPM

Tables 9.11 – 9.15 presented the Likert scale analysis for the government policies, frameworks and FIDPM driver. It was critical to investigate the current state of governments policy development and implementation initiatives, procurement challenges including whether government has the ability to apply the FIDPM principles and benefits towards improving public sector service delivery. The driver listed five unobserved variables and 39 indicators illustrated in Figure 9.2. The mean values were ranked and highlighted the following:

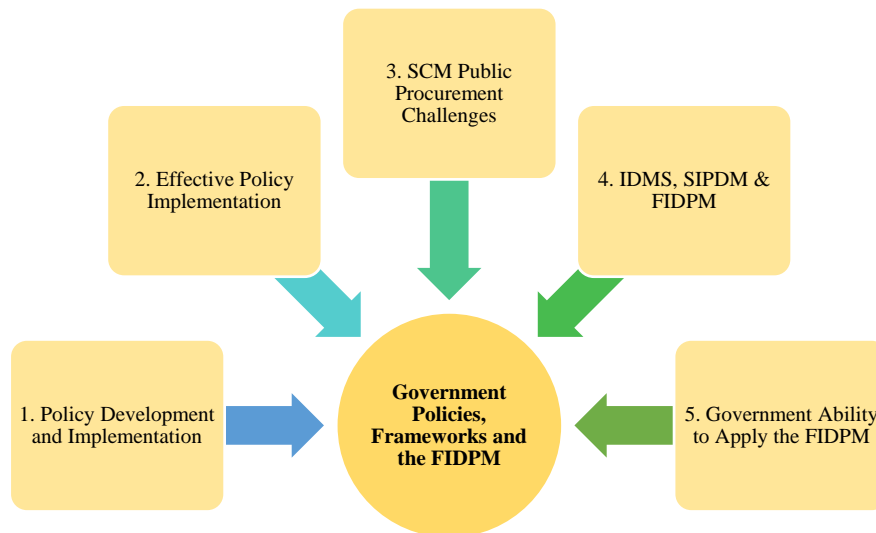


Figure 9.2. Government Policies, Frameworks and the FIDPM

1. Policy Development and Implementation

Authors such as Emuze and Smallwood (2013) and Khumalo *et al.* (2017) highlight that current policy does not effectively address service delivery, government are not successful in policy implementation and infrastructure delivery requires a new trajectory. Respondents experience with government on public sector projects were illustrated in Table 9.11 and were not ranked as it grouped three key statements which required respondents to rate their level of agreement on.

Items PDI1 “*Current policy development in SA...*” and PDI2 “*Government is good at policy development...*” depicted mean values of 1.26 and 1.24 and questioned respondents experience on whether current policy development addressed the concerns of service delivery including governments understanding and success in implementing policy. Table 9.11 highlighted that 90.7% of respondents strongly disagreed that they had any positive experiences, which is of serious concern and emphasises that policy development is not addressing service delivery concerns.

Furthermore, governments understanding and success in policy implementation is lacking and needs to be urgently addressed. The intent of this item PD13 “*the infrastructure delivery model...*” ($m = 4.48$) was to test the level of agreement respondents had towards whether infrastructure delivery requires a new trajectory in addressing service delivery challenges. The response rate indicated, 96.3% of respondents strongly agreed that the delivery model does require new trajectory suggesting that current policy is not effective and that the FIDPM may require additional support to improve implementation.

Table 9.11: Policy Development and Implementation

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Deviation
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree			
PDI1	Current policy development in SA and policy implementation addresses and deals with their targeted areas of concern regarding improving public service delivery.	N	372	1	37	0	0	410	1.26	0.645
		%	90.7%	0.2%	9.0%	0.0%	0.0%	100.0%		
PDI2	Government is good at policy development, understands the policy directions they would like to take, and are successful at implementing policy.	N	361	48	1	0	0	410	1.24	0.563
		%	88.0%	11.7%	0.2%	0.0%	0.0%	100.0%		
PDI3	The infrastructure delivery model requires a new trajectory in tackling the under-development and triple challenges of poverty, unemployment and slow economic growth.	N	0	0	0	15	395	410	4.83	0.511
		%	0.0%	0.0%	0.0%	3.7%	96.3%	100.0%		

2. Effective Policy Implementation

The PSC (2005), PSC (2010), PSC (2015) and PSC (2018) service delivery evaluation reports highlighted several critical challenges remain through the development and use of service standards to access service delivery. Table 9.12 investigated poor quality public service standards encountered in alignment to effective policy implementation on public sector projects.

Respondents encountered items EPI7 “*Little understanding within some departments ...*” (62.2%), EPI2 “*Service standards not readily available...*” (65.6%) and EPI8 “*Not linking the concept of service standards...*” (58.8%) often when working on public sector projects. This indicated public service employees have a poor understanding of service standards, they do not make service standards readily available to clients and are not able to link service standards to policy reform initiatives, suggesting that government need to train, develop, and build capacity towards ensuring skilled public servants achieve service delivery targets through robust policy implementation.

The responses to item EPI1 “*Departments not having service standards*” was of serious concern as 324 respondents indicated that they often experienced departments with no service standards. This indicates that public sector are not adhering to the policies and guidelines set out by the government. The consistent and successful delivery of services cannot be achieved if not implemented in alignment to service standards. Table 9.12 further illustrates that respondent’s often to always encountered poor quality public service in alignment to effective policy implementation, emphasising government public service standards are poor and policy implementation is not effective.

Table 9.12: Effective Policy Implementation

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Never	Seldom	Sometimes	Often	Always				
EPI7	Little understanding within some departments that considerable effort is required, beyond simply defining service standards, to implement the concept.	N	0	0	0	255	155	410	4.38	0.485	1
		%	0.0%	0.0%	0.0%	62.2%	37.8%	100.0%			
EPI2	Service standards not readily available to internal or external clients and therefore clients were unaware of the level of service that could be delivered.	N	0	0	0	269	141	410	4.34	0.476	2
		%	0.0%	0.0%	0.0%	65.6%	34.4%	100.0%			
EPI8	Not linking the concept of service standards to current initiatives to reform the public service in South Africa such as the eight Batho Pele principles.	N	0	0	14	241	155	410	4.34	0.543	2
		%	0.0%	0.0%	3.4%	58.8%	37.8%	100.0%			
EPI3	Too much emphasis was placed on the responsibilities of government departments and very little emphasis was placed on the responsibilities of the clients who access services.	N	0	0	14	255	141	410	4.31	0.532	3
		%	0.0%	0.0%	3.4%	62.2%	34.4%	100.0%			
EPI4	Service standards were sometimes unachievable, thus leading to clients having exaggerated expectations regarding how soon the service could be rendered.	N	0	0	14	254	142	410	4.31	0.533	3
		%	0.0%	0.0%	3.4%	62.0%	34.6%	100.0%			
EPI5	Members of staff were often uninformed regarding their departments service standards and were therefore unaware of whether services were delivered to the standards set by their department.	N	0	0	61	171	178	410	4.29	0.709	4
		%	0.0%	0.0%	14.9%	41.7%	43.4%	100.0%			
EPI6	Certain departments had rigid and uniform service standards across the whole department, which took no account of local (urban vs. rural) or service variations.	N	0	0	37	218	155	410	4.29	0.622	4
		%	0.0%	0.0%	9.0%	53.2%	37.8%	100.0%			
EPI1	Departments not having service standards.	N	0	0	0	324	86	410	4.21	0.408	5
		%	0.0%	0.0%	0.0%	79.0%	21.0%	100.0%			

3. SCM Public Procurement Challenges

Supply chain management has been identified as a critical part of procurement in the South African public sector (Ambe and Badenhorst-weiss, 2012). However, despite utilising SCM as a strategic tool, public procurement challenges are present (National Treasury, 2005). Table 9.13 depicted whether SCM still faced public procurement challenges.

According to Davey and Getenby (2017) recent policy developments placed greater support on public procurement as a tool for achieving economic transformation. However, authors such as Ambe and Badenhorst-weiss (2012) and Bolton (2006) argued that public procurement practitioners require

specific knowledge about procurement objectives and policies to manage procurement processes effectively. Items SCMPPC4 “*Accountability, fraud and corruption*” and SCMPPC5 “*Inadequate monitoring and evaluation of SCM*” shared a mean value of 4.86, illustrating 90% of respondents felt public servants were not held accountable while fraud and corruption still plagued government. Furthermore, the responses indicated SCM was not monitored and evaluated based on their performance to meet procurement targets suggesting government are not effectively managing public procurement, directly impacting service delivery negatively. Only 4% of respondents chose to remain neutral. It was alarming that 311 respondents strongly agreed with item SCMPPC1 “*Lack of proper knowledge...*” as SCM cannot be expected to implement successful public procurement through public servants who display a lack knowledge, skills and capacity. Government needs to address the concerns of public procurement challenges as Table 9.13 indicated respondents felt these challenges are still present.

Table 9.13: SCM Public Procurement Challenges

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
SCMPPC4	Accountability, fraud and corruption.	N	0	0	19	21	370	410	4.86	0.465	1
		%	0.0%	0.0%	4.6%	5.1%	90.2%	100.0%			
SCMPPC5	Inadequate monitoring and evaluation of SCM	N	0	0	15	26	369	410	4.86	0.438	1
		%	0.0%	0.0%	3.7%	6.3%	90.0%	100.0%			
SCMPPC7	Ineffectiveness of the black economic empowerment (BEE) policy.	N	0	0	23	19	368	410	4.84	0.496	2
		%	0.0%	0.0%	5.6%	4.6%	89.8%	100.0%			
SCMPPC6	Too much decentralisation of the procurement system.	N	0	0	29	34	347	410	4.78	0.562	3
		%	0.0%	0.0%	7.1%	8.3%	84.6%	100.0%			
SCMPPC3	Inadequate planning and linking of demand to the budget.	N	0	0	0	65	331	410	4.77	0.494	4
		%	0.0%	0.0%	0.0%	15.9%	80.7%	100.0%			
SCMPPC2	Non-compliance with SCM policy and regulations.	N	0	1	18	75	316	410	4.72	0.551	5
		%	0.0%	0.2%	4.4%	18.3%	77.1%	100.0%			
SCMPPC1	Lack of proper knowledge, skills and capacity from public servants.	N	0	0	22	77	311	410	4.7	0.562	6
		%	0.0%	0.0%	5.4%	18.8%	75.9%	100.0%			

4. IDMS, SIPDM & FIDPM

It was important to understand whether respondents were familiar with the IDMS and FIDPM, and also the SIPDM, as the SIPDM was a component of the IDMS and was the system implemented prior to the FIDPM (IDMS, 2014). Table 9.14 explored respondent’s knowledge, awareness, and application levels of the IDMS, SIPDM and FIDPM. As a result, the responses were not ranked.

The responses indicated, 91% of respondents had a relatively good understanding of items ISF1 “*National Treasury’s Infrastructure Delivery Management System*”, ISF2 “*National Treasury’s Standard for Infrastructure Procurement and Delivery Management*” and ISF3 “*Framework for Infrastructure Delivery and Procurement Management*” which shared an equal mean value of 4.79.

This was a supportive result for government as it indicated respondents have a good knowledge base, awareness, and application of the IDMS, SIPDM and FIDPM. Further accentuating, experienced project managers through their key role on projects are in a key position to assist government improve service delivery, through effective implementation of policy objectives (FIDPM, 2019; Knipe *et al.* 2016).

Table 9.14: IDMS, SIPDM & FIDPM

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev
			Very Poor	Poor	Average	Good	Excellent			
ISF1	National Treasury’s Infrastructure Delivery Management System (IDMS) as a model for best practice delivery of infrastructure management within the public sector.	N	0	0	14	23	373	410	4.79	0.698
		%	0.0%	0.0%	3.4%	5.6%	91.0%	100.0%		
ISF2	National Treasury’s Standard for Infrastructure Procurement and Delivery Management (SIPDM) in support of the supply chain for infrastructure procurement and delivery management to all departments, constitutional institutions and public entities.	N	0	0	14	23	373	410	4.79	0.698
		%	0.0%	0.0%	3.4%	5.6%	91.0%	100.0%		
ISF3	National Treasury Instruction No.3 of 2019/2020 which repealed the SIPDM effective from 01st October 2019 and gave legal effect to the Framework for Infrastructure Delivery and Procurement Management (FIDPM).	N	0	0	14	23	373	410	4.79	0.698
		%	0.0%	0.0%	3.4%	5.6%	91.0%	100.0%		

5. Government Ability to Apply the IDMS Principles and Benefits through the FIDPM

The National Treasury service delivery review conducted in 2002 saw the development and implementation of the IDMS which was chosen as the government wide system for infrastructure delivery, indicating governments initiative for improving service delivery (FIDPM, 2019). The final unobserved variable highlighted PMs experiences on public sector projects with governments ability to apply infrastructure delivery management tools principles and benefits through the implementation of the FIDPM. The mean values were ranked separately for the principles, presented in Table 9.15 and benefits presented in Table 9.16, to allow for a structured discussion of the data responses.

Governments Ability to apply IDMS Principles through the FIDPM

The Infrastructure Delivery Management System (IDMS) is governments policy for the strategic implementation of enhancing socio-economic growth and development through infrastructure delivery (IDMS, 2019). As a result, the IDMS principles and benefits aim to assist in successful and robust policy implementation (IDMS, 2019). However, the implementation and sustainability of the IDMS remains a challenge (National Treasury, 2019). Table 9.15 indicated that item GAAFP5 “*continuous improvement and scalability*” (m = 1.78) was rated by 55.6% of respondents as below standards and by a further 42.9% as far below standards. This result was concerning as it clearly indicated government are not aligned to the principles of Batho Pele.

However, 49.3% of respondents rated item GAAFP4 “*evidence-based decision making*” and 75.6% rated GAAFP6 “*continuous capacity and capability building*” as below standards (m = 1.59), emphasising government does not display continuous improvement and measures for evaluation through scalability while decision making, and continuous capacity building was non-evident. Further reinforcing the discussion under Effective Policy Implementation, that government needs to develop and build capacity towards ensuring service delivery goals are achieved through the implementation of the FIDPM. Table 9.15 depicted respondents found governments ability below standards when applying the IDMS principles through the FIDPM.

Table 9.15: Governments Ability to apply IDMS Principles through the FIDPM

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Far Below Standards	Below Standards	Meet Standards	Above Standards	Far Above Standards				
GAAFP5	Continuous improvement and scalability	N	176	228	6	0	0	410	1.78	0.54	1
		%	42.9%	55.6%	1.5%	0.0%	0.0%	100.0%			
GAAFP2	Planning alignment	N	127	252	25	0	0	410	1.74	0.563	2
		%	32.4%	61.5%	6.1%	0.0%	0.0%	100.0%			
GAAFP1	Policy consistency	N	127	275	6	2	0	410	1.72	0.539	3
		%	31.0%	97.1%	1.5%	0.5%	0.0%	100.0%			
GAAFP3	Clarity of responsibility and accountability	N	184	197	29	0	0	410	1.62	0.614	4
		%	44.9%	48.0%	7.1%	0.0%	0.0%	100.0%			
GAAFP4	Evidence-based decision making	N	189	202	19	0	0	410	1.59	0.58	5
		%	46.1%	49.3%	4.6%	0.0%	0.0%	100.0%			
GAAFP6	Continuous capacity and capability building	N	90	310	10	0	0	410	1.59	0.522	5
		%	22.0%	75.6%	2.4%	0.0%	0.0%	100.0%			

Governments Ability to apply IDMS benefits through the FIDPM

The ability to apply the IDMS principles impact the benefits that can be achieved towards an improved service delivery (IDMS, 2019).

Table 9.16 illustrated 303 (73.9%) respondents rated item GAAFB11 “*senior management will have a tool...*” below standards with the highest with mean value of 1.85, suggesting that senior management are not utilising their tools to effectively execute their mandate and hold delivery managers accountable. In addition, 58.5% of respondents rated item GAAFB6 “*improved management of the procurement...*” below standards (m = 1.66). This indicated the need for improved management in government and supported the discussion under SCM Public Procurement Challenges, that government are not effectively managing public procurement, directly impacting the effective implementation of the FIDPM towards improved service delivery (FIDPM, 2019). The results of the data set in Table 9.16 indicated government is not effectively implementing the principles and benefits the IDMS offers through the implementation of the FIDPM.

Table 9.16: Governments Ability to apply IDMS benefits through the FIDPM

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Far Below Standards	Below Standards	Meet Standards	Above Standards	Far Above Standards				
GAAFB11	Senior management will have a tool to hold delivery managers accountable for performance.	N	85	303	22	0	0	410	1.85	0.488	1
		%	20.7%	73.9%	5.4%	0.0%	0.0%	100.0%			
GAAFB3	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	N	88	302	20	0	0	410	1.83	0.486	2
		%	21.5%	73.7%	4.9%	0.0%	0.0%	100.0%			
GAAFB4	Development of programme plans, using simple templates and guides.	N	100	282	28	0	0	410	1.82	0.531	3
		%	24.4%	68.8%	6.8%	0.0%	0.0%	100.0%			
GAAFB1	Understanding of delivery and procurement management processes	N	90	310	10	0	0	410	1.8	0.454	4
		%	22.0%	75.6%	2.4%	0.0%	0.0%	100.0%			
GAAFB9	Greater level of certainty achieved within the construction industry of how projects are rolled out by the public sector.	N	107	282	21	0	0	410	1.79	0.519	5
		%	26.1%	68.8%	5.1%	0.0%	0.0%	100.0%			
GAAFB12	The quality and value for money of service delivery will improve.	N	125	264	21	0	0	410	1.75	0.541	6
		%	30.5%	64.4%	5.1%	0.0%	0.0%	100.0%			
GAAFB10	A structured environment for inexperienced delivery managers to thrive	N	100	309	1	0	0	410	1.76	0.434	7
		%	24.4%	75.4%	0.2%	0.0%	0.0%	100.0%			
GAAFB5	Alignment of the allocated budgets to infrastructure programmes.	N	109	294	7	0	0	410	1.75	0.471	8
		%	26.6%	71.7%	1.7%	0.0%	0.0%	100.0%			
GAAFB8	Greater level of uniformity of infrastructure project implementation, across different organs of state.	N	108	299	3	0	0	410	1.74	0.453	9
		%	26.3%	72.9%	0.7%	0.0%	0.0%	100.0%			
GAAFB7	Improved oversight of the implementation of projects and performance of the contract administration.	N	156	225	29	0	0	410	1.69	0.597	10
		%	38.0%	54.9%	7.1%	0.0%	0.0%	100.0%			
GAAFB2	Improved control of infrastructure delivery, due to appropriate decision points	N	145	146	19	0	0	410	1.69	0.553	10
		%	35.4%	60.0%	4.6%	0.0%	0.0%	100.0%			
GAAFB6	Improved management of the procurement of supplies, services and construction works.	N	155	240	15	0	0	410	1.66	0.547	11
		%	37.8%	58.5%	3.7%	0.0%	0.0%	100.0%			

9.2.4.1 Summary of Findings – Government Policies, Frameworks and the FIDPM

The findings for the government policies, frameworks and the FIDPM driver were summarised as follows:

1. Policy development and implementation are not resulting in successful service delivery,
2. Government is not effective in policy implementation,
3. Supply chain management as a strategic tool still faces public procurement challenges,
4. PMs are aware of the IDMS, SIPDM and FIDPM,
5. Government is not effectively implementing the principles and benefits the IDMS offers through the implementation of the FIDPM.

9.2.4.2 Skewness and Kurtosis

The descriptive statistics of the government policies, frameworks and the FIDPM driver indicated most items displayed negative skewness while some of the items were moderately and severely skewed. Furthermore, although some of the items depicted extreme levels of kurtosis most items were not too kurtotic (skewness and kurtosis Table in Appendix H). This data set displayed non-normally distributed data which required caution and strong maximum likelihood estimation to be implemented.

9.2.5 Project Management Tools and Techniques

Tables 9.17 – 9.25 presents the Likert scale analysis for the project management tools and techniques driver which examines the PM tools and techniques available to PMs and whether they may be applied towards assisting government with the implementation of the FIDPM. The driver entails seven unobserved variables and 75 indicators illustrated in Figure 9.3. In addition, this section discusses the first six unobserved variables. The mean values were ranked and highlighted the following:

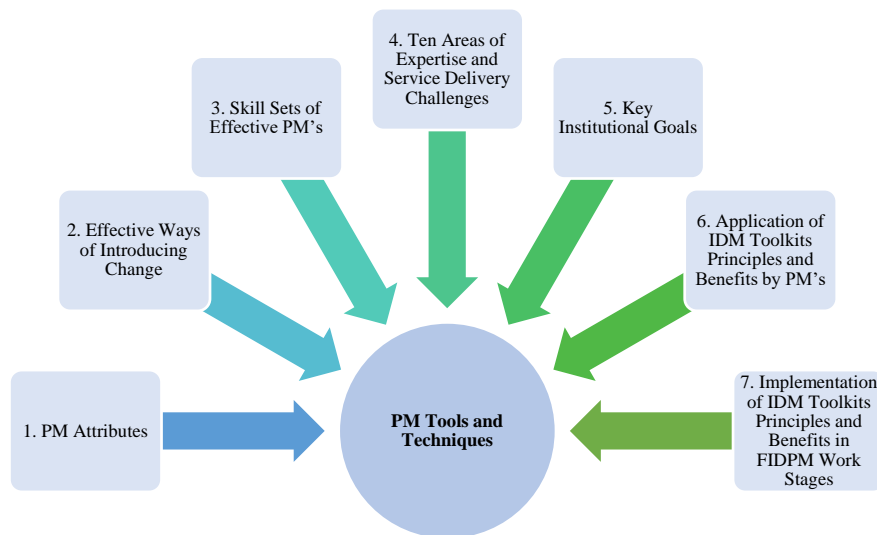


Figure 9.3. PM Tools and Techniques

1. PM Attributes

The appointment of the PM can influence the success or failure of a project and, as the single point of responsibility, the PM through the attributes they exhibit will guide a project to successful completion (Burke, 2019). Table 9.17 investigated whether respondents agreed that the attributes PMs possess can assist government improve service delivery, specifically through improving the implementation of the FIDPM on public sector projects. Item PMA1 “*ability to select and develop an operational team from a standing start*” was ranked the highest ($m = 4.90$) by 93.4% of respondents who strongly agreed. This suggested PMs are ready to assist government in the selection of operational teams which may be further developed from the outset of projects. More specifically, indicating their readiness be actively involved immediately from a standing start. It was noted that 248 of respondents strongly agreed with item

PMA11 “*the ability to keep the client happy*” (m = 4.50), which illustrated that this is still an important attribute for PMs to exhibit. Without client satisfaction, it is unlikely the project will be deemed successful. The results illustrated in Table 9.17 indicate that respondents felt their attributes may assist government with the implementation of the FIPDM towards improving service delivery.

Table 9.17: PM Attributes

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
PMA1	Select and develop an operational team from a standing start.	N	0	4	6	17	383	410	4.90	.422	1
		%	0.0%	1.0%	1.5%	4.1%	93.4%	100.0%			
PMA10	Administer the contract, the scope of work and scope changes.	N	0	4	4	27	375	410	4.89	.424	2
		%	0.0%	1.0%	1.0%	6.6%	91.5%	100.0%			
PMA9	Review, monitor and apply control.	N	0	4	7	25	374	410	4.88	.450	3
		%	0.0%	1.0%	1.7%	6.1%	91.2%	100.0%			
PMA7	Negotiate and persuade.	N	0	4	2	38	366	410	4.87	.428	4
		%	0.0%	1.0%	0.5%	9.3%	89.3%	100.0%			
PMA2	Leadership and management ability.	N	0	4	18	13	375	410	4.85	.523	5
		%	0.0%	1.0%	4.4%	3.2%	91.5%	100.0%			
PMA8	Understand the environment within which the project is being managed.	N	0	4	13	28	365	410	4.84	.508	6
		%	0.0%	1.0%	3.2%	6.8%	89.0%	100.0%			
PMA3	Anticipate problems, solve problems and make decisions.	N	0	4	9	43	354	410	4.82	.499	7
		%	0.0%	1.0%	2.2%	10.5%	86.3%	100.0%			
PMA4	Integrate project stakeholders.	N	0	4	10	48	348	410	4.80	.515	8
		%	0.0%	1.0%	2.4%	11.7%	84.9%	100.0%			
PMA5	Operational flexibility.	N	0	4	29	20	357	410	4.78	.610	9
		%	0.0%	1.0%	7.1%	4.9%	87.1%	100.0%			
PMA6	Plan, expedite and get things done.	N	0	4	12	44	350	410	4.80	.524	8
		%	0.0%	1.0%	2.9%	10.7%	85.4%	100.0%			
PMA11	To keep the client happy.	N	0	4	31	127	248	410	4.50	.721	10
		%	0.0%	1.0%	7.6%	31.0%	60.5%	100.0%			

2. Effective Ways of Introducing Change

Project management is extensively regarded as the most effective way of introducing unique change (APM PMBOK, 2019; PMBOK, 2021). Table 9.18 examines whether project management is the most effective way of introducing change to assist government improve service delivery.

All 410 respondents strongly agreed with item EWIC1 “*defining what has to be accomplished...*” (m = 5) which suggested respondents felt, defining project parameters critical towards effecting the most change as it provides a blueprint within which the project operates in terms of time, cost and quality. In addition, 78% of respondents agreed with the item EWIC4 “*employing persons skilled in project management...*” which had a mean value of 4.78, indicating the importance of this item, that employing skilled project managers was still regarded as a very effective way of introducing change. Project management literature argues that while projects should be managed by a PM, this isn’t always the case. Projects are more likely to be successful where a PM has been identified for its accomplishment as they

are able to adapt the project environments unique objectives, stakeholders and complexity ultimately contributing to projects success (APM PMBOK, 2019; PMBOK, 2021). The results in Table 9.18 strongly suggest PMs are in an opportune position to implement effective change towards assisting government improve service delivery on public sector projects.

Table 9.18: Effective Ways of Introducing Change

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
EWIC1	Defining what has to be accomplished, generally in terms of time, cost and various technical and quality performance parameters.	N	0	0	0	0	410	410	5.00	.000	1
		%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%			
EWIC3	Using appropriate project management techniques and tools to plan, monitor and maintain progress.	N	0	0	18	19	373	410	4.87	.452	2
		%	0.0%	0.0%	4.4%	4.6%	91.0%	100.0%			
EWIC2	Developing a plan to achieve these and then working this plan, ensuring that progress is maintained in line with these objectives.	N	0	0	18	29	363	410	4.84	.471	3
		%	0.0%	0.0%	4.4%	7.1%	88.5%	100.0%			
EWIC4	Employing a skilled project manager, who is given responsibility for introducing the change and is accountable for its successful accomplishment.	N	0	0	0	90	320	410	4.78	.414	4
		%	0.0%	0.0%	0.0%	22.0%	78.0%	100.0%			

3. Key Skill Sets of Effective PM's

The PMBOK (2017) identifies key skill sets of effective project managers. Table 9.19 examined whether PMs are able to utilise key skill sets to assist government improve service delivery.

While technical project management skills are core to program and project management, they are not enough in today's evolving, complex and competitive global marketplace. Organisations are therefore pursuing added skills to support strategic objectives to achieve targeted goals (PMBOK, 2017). All respondents strongly agreed with item KSSEP1 "technical project management" and 99.8% strongly agreed with item KSSEP2 "leadership" (m = 5). Technical project management involves PMs managing project elements, including but not limited to, schedule, cost, resources and risks while leadership demonstrates essential capabilities such as negotiation, resilience, communication, problem solving, critical thinking and interpersonal skills (PMBOK, 2017). This accentuated that these key skill sets are important in the aim towards PMs assisting government with service delivery goals.

In addition, 385 respondents strongly agreed with item KSSSEP3 "strategic business management" indicating strategy implementation in a way that maximises business value of the project is a vital skill set for PMs. The results suggest government should be no different to other PM orientated organisations, emphasising that they may also pursue added skills offered through project management to support their own strategic objectives. Table 9.19 highlighted that respondents agreed, key skill sets of effective project managers should be used to assist government improve service delivery on public sector projects.

Table 9.19: Key Skill Sets of Effective PM's

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
KSSEP1	Technical Project Management - The knowledge, skills and behaviours related to specific domains of project.	N	0	0	0	0	410	410	5.00	.000	1
		%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%			
KSSEP2	Leadership - The knowledge, skills and behaviours needed to guide, motivate and direct a team.	N	0	0	0	1	409	410	5.00	.049	1
		%	0.0%	0.0%	0.0%	0.2%	99.8%	100.0%			
KSSEP3	Strategic and Business Management - The knowledge of and expertise in the industry and organisation.	N	0	0	0	25	385	410	4.94	.240	2
		%	0.0%	0.0%	0.0%	6.1%	93.9%	100.0%			

4. Ten PM Areas of Expertise and Service Delivery Challenges

The Project Management Institute (PMI) highlights ten knowledge areas under which PMs implement their knowledge, skills, tools, and techniques (PMBOK, 2017). Table 9.20 investigated whether PMs are able to use their skills under the ten knowledge areas of expertise to assist government address service delivery challenges.

The IDMS (2019) and PMBOK (2017) emphasises that using project management processes, tools and techniques puts a sound foundation in place for organisations to achieve their goals and objectives. As a result, government should not be excluded as project management can be adopted to suite government's needs. Table 9.20 illustrated 410 (100%) respondents strongly agreed with items ESDC11 "poor site management from public servants during construction", ESDC12 "time and cost variations" and ESDC13 "skills and competency issues" (m = 5). This depicted that PMs are able to utilise their skills which can be implemented throughout the project lifecycle which comprises the management of all involved towards achieving the project objectives safely and within agreed time, cost, technical, quality and other performance criteria (APM PMBOK, 2019).

Furthermore, 79.5% of respondents also strongly agreed with item ESDC5 "mismanagement of funds" (m = 4.63) which suggested PMs are able to assist government address a serious service delivery challenge. A project as a vehicle for service delivery and project management is a strategic tool available at any organisations disposal to enhance service delivery including sound financial management (Knipe *et al.* 2016). The responses in Table 9.20 indicated that PMs are able to assist government with the listed service delivery challenges towards ensuring the successful implementation of the FIDPM to improve service delivery.

Table 9.20: Ten PM Areas of Expertise and Service Delivery Challenges

Item No.	Description	N	1	2	3	4	5	Total	Mean	Std. Dev.	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
ESDC11	Poor site management from public servants during construction.	N	0	0	0	0	410	410	5.00	.000	1
		%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%			
ESDC12	Time and cost variations.	N	0	0	0	0	410	410	5.00	.000	1
		%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%			
ESDC13	Skills and competency issues.	N	0	0	0	0	410	410	5.00	.000	1
		%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%			
ESDC3	Prolonged procurement processes resulting in delayed appointments, ultimately delaying construction.	N	0	0	10	47	353	410	4.84	.431	2
		%	0.0%	0.0%	2.4%	11.5%	86.1%	100.0%			
ESDC2	Implementation issues.	N	0	0	15	55	340	410	4.79	.488	3
		%	0.0%	0.0%	3.7%	13.4%	82.9%	100.0%			
ESDC4	Acute problems of institutional capacity.	N	0	0	26	30	354	410	4.80	.536	3
		%	0.0%	0.0%	6.3%	7.3%	86.3%	100.0%			
ESDC8	Training and development programmes not being underpinned by people first values.	N	0	0	14	57	339	410	4.79	.483	3
		%	0.0%	0.0%	3.4%	13.9%	82.7%	100.0%			
ESDC6	A lack of public participation.	N	0	0	6	84	320	410	4.77	.457	4
		%	0.0%	0.0%	1.5%	20.5%	78.0%	100.0%			
ESDC9	Lack of effective monitoring and evaluation mechanisms internally and externally.	N	0	0	23	52	335	410	4.76	.543	5
		%	0.0%	0.0%	5.6%	12.7%	81.7%	100.0%			
ESDC10	Strategic planning activities on service delivery are limited to senior management.	N	0	0	24	55	331	410	4.75	.553	6
		%	0.0%	0.0%	5.9%	13.4%	80.7%	100.0%			
ESDC1	Policy issues.	N	0	0	38	49	323	410	4.70	.631	7
		%	0.0%	0.0%	9.3%	12.0%	78.8%	100.0%			
ESDC7	Absence of people centred culture and lack of objectives in the public service.	N	0	0	21	94	295	410	4.67	.570	8
		%	0.0%	0.0%	5.1%	22.9%	72.0%	100.0%			
ESDC5	Mismanagement of funds.	N	0	0	69	15	326	410	4.63	.756	9
		%	0.0%	0.0%	16.8%	3.7%	79.5%	100.0%			

5. Key Institutional Goals

The fundamental driver behind the application of project management in government is to improve state institution's ability to deliver efficient, effective and high-quality services. Project management is able to support the achievement of institutional goals as well as provide greater assurance to stake holders that resources are effectively managed (Srivannaboon and Milosevic, 2006). Table 9.21 identified whether respondents agreed with PMs being able to assist government achieve key institutional goals towards improving service delivery.

All respondents (100%) strongly agreed with item KIG2 *"to be more efficient and effective in the use of public resources"* (m = 5), suggesting that government struggles with maximising the use of its resources efficiently and effectively, contributing to poor service delivery and the PM assistance is indeed required. It was concerning to note that government does not optimise its use of its resources when the public interest regarding the delivery of services is at stake. Interestingly 345 respondents also strongly agreed that item KIG4 *"to improve access to services..."* requires further PM intervention

towards assisting government achieve key institutional goals. This depicted that PMs are able to assist government address the needs of its citizens through the improvement of service delivery as this is a critical area where additional support is required. The responses in Table 9.21 signify that PMs are in a position to assist government achieve key institutional goals.

Table 9.21: Key Institutional Goals

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
KIG2	To be more efficient and effective in the use of public resources.	N	0	0	0	0	410	410	5.00	.000	1
		%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%			
KIG8	To better utilise technology in the delivery of services.	N	0	0	9	45	356	410	4.85	.418	2
		%	0.0%	0.0%	2.2%	11.0%	86.8%	100.0%			
KIG5	To be more flexible and more efficient in the use of allocated funding.	N	0	0	7	53	350	410	4.84	.414	3
		%	0.0%	0.0%	1.7%	12.9%	85.4%	100.0%			
KIG1	To be more responsive and relevant to the needs of citizens.	N	0	0	19	33	358	410	4.83	.486	4
		%	0.0%	0.0%	4.6%	8.0%	87.3%	100.0%			
KIG4	To improve access to services, make them more responsive to the needs of citizens.	N	0	0	21	44	345	410	4.79	.519	5
		%	0.0%	0.0%	5.1%	10.7%	84.1%	100.0%			
KIG7	To have the ability to adjust policies and processes when societal problems are detected.	N	0	0	42	29	339	410	4.72	.637	6
		%	0.0%	0.0%	10.2%	7.1%	82.7%	100.0%			
KIG3	To be more representative of the diversity and needs of all, especially the most disadvantaged sectors of society.	N	0	0	14	95	301	410	4.70	.528	7
		%	0.0%	0.0%	3.4%	23.2%	73.4%	100.0%			
KIG6	To remove the command/ control approach of management and accompanying excess regulation.	N	0	0	7	129	274	410	4.65	.512	8
		%	0.0%	0.0%	1.7%	31.5%	66.8%	100.0%			

6. Application of IDM Toolkits Principles and Benefits by PMs

The FIDPM prescribes the minimum requirements for the implementation of the IDMS through the infrastructure delivery management project processes. Respondents level of agreement with PMs applying the infrastructure delivery management toolkits principals and benefits through the FIDPM was examined in Table 9.22.

Application of IDMS Principles by PMs

The IDMS (2019) highlights key principals towards ensuring the effective development and implementation of infrastructure strategy.

The responses in Table 9.22 illustrated 364 (79%) respondents strongly agreed with item AITP6 “continuous capacity and capability building” (m = 4.86). A serious concern for government that requires PM intervention, continuous capacity building is a key component for government to ensure they have the necessary skilled resources to implement successful service delivery. This emphasised

PMs are able to assist government build and improve capacity. Continuous policy development is critical for adapting to economic climate change, government has been identified as being good at policy development, but poor in implementation. (Schwella, 2001; Kanyane, 2014). Interestingly 68.8% of respondents strongly agreed with item AITP1 “*policy consistency*” which had a mean value of 4.66 suggesting that government should be consistent with policy implementation. More importantly, government needs to ensure that they have skilled resources to implement service delivery policy. This will ensure policy implementation improves and remains consistent (Kanyane, 2014). The relative closeness of mean values suggests that respondents felt all principles in Table 9.22 need to be applied by PMs through the implementation of the FIDPM on public sector projects.

Table 9.22: Application of IDM Toolkits Principles by PM’s

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
AITP6	Continuous capacity and capability building.	N	0	0	13	33	364	410	4.86	.433	1
		%	0.0%	0.0%	1.2%	19.8%	79.0%	100.0%			
AITP5	Continuous improvement and scalability (structured to assist all).	N	0	0	16	50	344	410	4.80	.488	2
		%	0.0%	0.0%	3.9%	12.2%	83.9%	100.0%			
AITP4	Evidence-based decision making.	N	0	0	22	52	336	410	4.77	.536	3
		%	0.0%	0.0%	5.4%	12.7%	82.0%	100.0%			
AITP3	Clarity of responsibility and accountability.	N	0	0	23	55	332	410	4.75	.546	4
		%	0.0%	0.0%	5.6%	13.4%	81.0%	100.0%			
AITP2	Planning alignment.	N	0	0	21	59	330	410	4.75	.537	4
		%	0.0%	0.0%	5.1%	14.4%	80.5%	100.0%			
AITP1	Policy consistency.	N	0	0	12	116	282	410	4.66	.533	5
		%	0.0%	0.0%	2.9%	28.3%	68.8%	100.0%			

Application of IDMS Benefits by PM’s

The significance of project management is regarded as a cornerstone for any institutions responsible for rendering services to the public or customers (Knipe *et al.* 2016). In addition, the FIDPM recognises that project management plays a critical role in the delivery of public services in South Africa (FIDPM, 2019). The IDMS (2019) further notes through the implementation of the listed principles, key benefits are achievable.

The responses in Table 9.23 depicted, 87.1% of respondents strongly agreed with item AITB12 “*the quality and value for money...*” with a mean value of 4.92, and only five respondents (1.25) chose to remain neutral, accentuating that this benefit was not significantly experienced by PMs when working on public sector projects. This is a serious concern for government as it is in alignment with the principles of Batho Pele and needs to be urgently addressed as it is an important benefit. In addition, 75.4% of respondents strongly agreed with item AITB2 “*improved control of infrastructure delivery...*” (m = 4.71), further indicating government lacks control due to poor decision making within

infrastructure delivery and procurement management processes which is a fundamental problem that requires robust intervention. If decision points within the delivery and procurement processes are not effectively managed, service delivery challenges will never be addressed. Furthermore, respondents felt all benefits in Table 9.23 need to be achieved through the application of the infrastructure delivery management tools through the implementation of the FIDPM on public sector projects.

Table 9.23: Application of IDM Toolkits Benefits by PM's

Item No.	Description		1	2	3	4	5	Total	Mean	Std. Dev	Rank
			Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree				
AITB12	The quality and value for money of service delivery will improve.	N	0	1	18	34	357	410	4.92	1.993	1
		%	0.0%	0.2%	4.4%	8.3%	87.1%	100.0%			
AITB11	Senior management will have a tool to hold delivery managers accountable for performance.	N	0	0	13	29	368	410	4.87	.424	2
		%	0.0%	0.0%	3.2%	7.1%	89.8%	100.0%			
AITB8	Greater level of uniformity of infrastructure project implementation, across different organs of state.	N	0	1	13	69	327	410	4.86	1.999	3
		%	0.0%	0.2%	3.2%	16.8%	79.8%	100.0%			
AITB7	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	N	0	0	6	70	334	410	4.80	.436	4
		%	0.0%	0.0%	1.5%	17.1%	81.5%	100.0%			
AITB3	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	N	0	0	13	60	337	410	4.79	.479	5
		%	0.0%	0.0%	3.2%	14.6%	82.2%	100.0%			
AITB1	Understanding of delivery and procurement management processes including governance obligations.	N	0	0	5	81	324	410	4.78	.444	6
		%	0.0%	0.0%	1.2%	19.8%	79.0%	100.0%			
AITB10	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	N	0	0	11	67	332	410	4.78	.473	6
		%	0.0%	0.0%	2.7%	16.3%	81.0%	100.0%			
AITB6	Improved management of the procurement of supplies, services and engineering and construction works.	N	0	0	12	67	331	410	4.78	.481	6
		%	0.0%	0.0%	2.9%	16.3%	80.7%	100.0%			
AITB9	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	N	0	0	8	75	327	410	4.78	.461	6
		%	0.0%	0.0%	2.0%	18.3%	79.8%	100.0%			
AITB5	Alignment of the allocated budgets to infrastructure programmes.	N	0	0	16	73	321	410	4.74	.519	7
		%	0.0%	0.0%	3.9%	17.8%	78.3%	100.0%			
AITB4	Development of programme plans, using simple templates and guides.	N	0	0	15	80	315	410	4.73	.520	8
		%	0.0%	0.0%	3.7%	19.5%	76.8%	100.0%			
AITB2	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	N	0	0	19	82	309	410	4.71	.548	9
		%	0.0%	0.0%	4.6%	20.0%	75.4%	100.0%			

7. Implementation of IDM Toolkits Principles and Benefits in FIDPM Work Stages

The presence of the IDM toolkits principles and benefits being implemented by government over the project life cycle presented under the FIDPM seven work stages were examined in Tables 9.24 and 9.25. Table 9.24 first examined the implementation of principles.

Implementation of Principles in the FIDPM Work Stage 1- Initiation

During the first stage on public sector projects, the level of involvement from public employees is minimal as the project initiation and prefeasibility report is prepared by the professional consultant team guided by the PM (FIDPM, 2019). Table 9.24 illustrates item IDMTPC1 “*clarity of responsibility and accountability*” (m = 4.01) as 43.9% of respondents indicated this principle was always absent. While 44.1% of respondents indicated item IDMTPF1 “*continuous capacity and capacity building*” (m = 3.08) was seldomly present. This suggests while clarity of responsibility and accountability including capacity building by public employees was not extensively experienced by respondents, the reason could be a result of limited involvement from public employees. However, this does not exempt public employees from implementing these principles due to limited involvement in stage one.

Implementation of Principles in the FIDPM Work Stage 2 - Concept

Throughout work stage 2, the involvement of public employees increases through regular engagement with the professional consultant team to achieve the concept and feasibility report (FIDPM, 2019). Table 9.24 depicts item IDMTPC1 “*clarity of responsibility and accountability*” (m = 4.18) as 56.3% of respondents indicated this principle always non-existent. In addition, 54.1% of respondents illustrated IDMTPF1 “*continuous capacity and capacity building*” was non-existent. With increased engagement from public employees, it is alarming that respondents did not experience clarity of responsibility and accountability. In addition, evidence of limited capacity building became apparent, moving into work stage 2, indicating public employees are not implementing the principles in alignment with infrastructure delivery management system.

Implementation of Principles in the FIDPM Work Stage 3 – Design Development

In the third work stage, the key output is the design development report, prepared by the professional consultant team in regular and in-depth engagement with public sector (FIDPM, 2019). Table 9.24 presents the responses of stage 3 which highlighted 279 (68%) of respondents always felt item IMTPD3 “*evidence-based decision making*” was not implemented. However, 54.1% of respondents noted item IMTPD3 “*continuous improvement and scalability...*” (m = 4.06) was always absent. With work stage 3 becomes a key point for design development in a construction project and it is imperative for public employees to be able to engage with robust decision-making abilities as this is where project delays may occur, should decisions not be made timeously. Furthermore, it is critical for public employees to ensure continuous improvement including the ability to apply scalability in order to adapt to different

project demands during the various FIDPM work stages. Government needs to make every effort to ensure these principles are implemented as intended.

Implementation of Principles in the FIDPM Work Stage 4 – Design Documentation

Stage 4 is an important and pivotal stage during the project life cycle. With the completion all design documentation by the professional consultant team, facilitated and coordinated through the PM, infrastructure procurement also takes places through SCM during stage 4 (FIDPM, 2019). Table 9.24 illustrates 47.8% of respondents indicated they always felt item IDMTPF4 “*continuous capacity and capacity building*” was non-existent with a mean value of 4.03. In addition, 158 (38.5%) respondents further highlighted item IDMTPB4 “*planning alignment*” (m = 3.38) sometimes experienced this principle. The results highlight capacity building as a commonly lacking principle in the preliminary work stages, while planning alignment by public sector employees was sometimes noticeable. This signifies government should adopt a more rigorous approach towards ensuring capacity building and planning alignment is consistently implemented throughout the project stages. Many project delays occur before construction commences. Therefore, prolonged decision making, inadequate capacity building and uncertain planning alignment must be eliminated, if the FIDPM is to be effectively implemented.

Implementation of Principles in the FIDPM Work Stage 5 – Works

The fifth work stage entails the construction of works which is managed through the PM, professional consultant team and contractors. In addition, great input and engagement occurs with public sector employees as they ensure the government processes are implemented and in place on their end, such as ensuring monthly payments are processed including regular performance reporting of progress to other client stakeholders (FIDPM 2019; IDMS, 2019).

Table 9.24 exemplifies IDMTPF5 “*continuous capacity and capacity building*” appeared again as always non-existent by 219 (53.4%) of respondents with a mean value of 4.03, while item IDMTPA5 “*policy consistency*” was not experienced. The results highlight, government urgently requires capacity building to enhance public employee’s skills. Skilled public employees will ensure improved implementation of evidence-based decision making. Interestingly, policy consistency was also identified under stage 5, as some public sector projects, through prolonged completion of work stages, experience changes in policy during the project life cycle. An example would be projects which started under the guidance of the SIPDM and are now governed by the FIDPM as they may have still been in progress.

Implementation of Principles in the FIDPM Work Stage 6 - Handover

Stage 6 is an extension of stage 5, which entails handing over the completed works to the client and end users (FIDPM, 2019). Table 9.24 depicted 33.9% of respondents indicated they always felt item IDMTPF6 “*continuous capacity and capacity building*” was non-existent with a mean value of 3.89. However, 28.3% of respondents noted item IDMTPF6 was sometimes implemented, suggesting some public sector employees are skilled at stage 6, although the results are not convincing. Furthermore, 279 (68%) respondents sometimes felt IDMTPD6 “*evidence-based decision making*” ($m = 3.27$) was implemented which indicated some public sector employees exhibited the ability to make decisions during stage 6. The dispersion of the results illustrated in Table 9.33 (stage 6) suggests limited and questionable skills and knowledge base exhibited by public sector employees during this work stage.

Implementation of Principles in the FIDPM Work Stage 7 – Close-out

The final stage involves closing out the project which requires the PM to ensure the professional consultant team meets the requirements from a defined list of deliverables prescribed by the FIDPM (FIDPM, 2019). This stage is important as once the project draws to an end, and all contractual requirements are met, insurances, guarantees and retention held against the contracting stakeholder who executed the works are then required to be released. Table 9.24 highlighted 135 (32.9%) respondents illustrated item IDMTPB7 “*planning alignment*” ($m = 3.80$) was not always experienced and a further 32.2% of respondents noted it was sometimes present. In addition, 35.6% of respondents indicated they seldomly had issues with item IDMTPA7 “*policy consistency*”, 122 respondents felt this principle was only sometimes implemented. The responses vary in opinion as the experiences of these principles being implemented during stage 7 were mixed. Engagement with skilled public sector employees is imperative.

However, the spread of the results depicted in Table 9.24 suggests limited and questionable skills and knowledge base displayed by public sector employees. Successful infrastructure delivery does not rely solely on effective project management and the built environment professional. The role of government departments is crucial in terms of setting the direction and providing effective governance (Watermeyer, 2018). This further emphasised, the need for government to be geared up and ready to implement the principles of the IDM toolkit. If not done, the benefits discussed next will not be achievable.

Table 9.24: Implementation of Principles in the FIDPM Work Stages 1 - 7

Work Stage		Stage 1			Stage 2			Stage 3			Stage 4			Stage 5			Stage 6			Stage 7		
Item No.	Description	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank
IDMTPA	Policy consistency.	3.82	1.23	3	4.12	1.13	3	4.15	1.16	3	3.96	1.23	2	3.79	1.3	4	3.6	1.12	4	3.29	1.27	6
IDMTPB	Planning alignment.	3.68	1.28	4	4.1	1.09	5	4.13	1.23	4	3.38	1.19	5	4.03	1.11	2	3.61	0.99	3	3.8	1.03	1
IDMTPC	Clarity of responsibility and accountability.	4.01	1.07	1	4.18	1.06	1	4.17	1.12	2	3.94	1.23	3	3.56	1.22	5	3.6	1.29	4	3.34	1.26	5
IDMTPD	Evidence-based decision making.	3.86	1.06	2	4.11	1.11	4	4.4	1.05	1	3.93	1.06	4	3.79	1.32	4	3.27	1.05	5	3.67	1.08	2
IDMTPE	Continuous Improvement and scalability (structured to assist all).	3.69	1.15	5	4.16	1.09	2	4.06	1.2	6	3.93	1.29	4	3.9	1.16	3	3.72	1.21	2	3.47	1.28	3
IDMTPF	Continuous capacity and capability building.	3.08	1.23	6	4.09	1.2	6	4.12	1.07	5	4.03	1.04	1	4.04	1.2	1	3.89	0.98	1	3.41	1.26	4

Implementation of Benefits in FIDPM Work Stages

The next section examined the implementation of benefits which were presented in Table 9.25 and the findings were discussed as follows:

The Implementation of Benefits in the FIDPM Work Stage 1 – Initiation

Item IDMTBL1 “*The quality and value for money...*” (m = 4.12) was often not experienced by 51% of respondents. It is concerning respondents indicated this benefit was often non-existent from project commencement. Value for money is a principle of Batho Pele and government needs to focus on improving quality and value for money as this sets the tone of governments commitment to improve service delivery from stage 1. Furthermore, 195 (47.6%) of respondents noted that they sometimes experienced item IDMTBB1 “*improved control of infrastructure delivery...*” with a mean value of 3.43. This suggested due to minimal involvement from government during this stage (discussed under stage 1 of IDM principles), this benefit was sometimes experienced. However, the results suggest this benefits is not consistently present, as government has been identified to harbour poorly skilled employees. Table 9.25 further highlights that IDM benefits are not being consistently achieved in the first work stage.

The Implementation of Benefits in the FIDPM Work Stage 2 – Concept

Table 9.25 indicated 71.5% of respondents always found item IDMTBC2 “*consistent, reliable reporting...*” not present, with a mean value of 4.21, signifying public sector employees were not consistent and reliable in their reporting. This can lead to inaccurate performance tracking and budget allocation of projects if not addressed by government. In addition, 206 (50.2%) of respondents indicated item IDMTBD2 “*development of programme plans...*” (m = 3.69) was always not exhibited. However, 21.5% of respondents indicated no poor experiences with this item as it was present. This suggests some respondents may have worked on public sector projects with experienced public sector employees that enabled this benefit to be experienced, while others encountered poorly skilled employees. The results in Table 9.25 further noted, IDM benefits are not being achieved at an acceptable level during stage 2 by government.

The Implementation of Benefits in the FIDPM Work Stage 3 – Design Development

The next stage highlighted item IDMTBL3 “*the quality and value for money...*” (m = 4.57) this benefit was always non-existent by 78% of respondents. This highlighted no benefit being experienced from a principle of Batho Pele during the third work stage which is of serious concern for government to address.

However, 178 (43.4%) of respondents noted that they sometimes experienced item IDMTBB3 “*consistent reliable reporting*”, suggesting in stage 3 that some respondents experienced skilled public sector employees who were able to ensure this benefit was achieved. However, due to lack of capacity building identified under IDM principles, poorly skilled employees may not have the ability to effectively implement improved infrastructure delivery. The dispersion of responses in Table 9.25 indicates government are not achieving the benefits highlighted by the IDM toolkit.

The Implementation of Benefits in the FIDPM Work Stage 4 – Design Documentation

It was of serious concern that item IDMTBL4 “*the quality and value for money...*” (m = 4.62) was again rated by 82% of respondents who found this benefit always non-existent. This indicated the importance respondents felt through the absence of this benefit, as stage 4 has been identified as an important and pivotal stage in the project life cycle (FIDPM, 2019). Based on the high level of involvement between both professional consultant team and government, it is imperative government consistently achieves this benefit at this critical work stage. In addition, 326 (79.5%) of respondents depicted item IDMTBD2 “*development of programme plans...*” (m = 3.69) was always not present, indicating government is not effectively implementing its service delivery plans in a simple and structured approach. Detailed regulation and central prescription including excessive bureaucracy and lengthy procedures are not in the interest of customers, leading to hampered progress of service delivery. Government needs to address these concerns urgently. The responses in Table 9.25 further suggest that government are not achieving the IDM toolkits key benefits.

The Implementation of Benefits in the FIDPM Work Stage 5 – Works

Table 9.25 depicted 56.6% of respondents always found item IDMTBB5 “*improved control of infrastructure delivery...*” to be absent by government (m = 4.27), which signified unskilled public sector employees could be out of their depths in attempting to ensure improved control of infrastructure delivery is achieved through sound decision making processes. Government needs to ensure through robust capacity building, its bolsters its resource base with skilled public sector employees capable of implementing and achieving IDM benefits. Furthermore, 222 respondents noted item IDMTBH5 “*greater level of uniformity...*” was always non-existent with a mean value of 4.04. This suggested respondent’s experiences with various of organs of state yielded the same experiences regarding the absenteeism uniform infrastructure project implementation during stage 5. Table 9.25 further highlighted respondent’s experiences in stage 5 with different organs of state, IDM benefits were not effectively present.

The Implementation of Benefits in the FIDPM Work Stage 6 – Handover

Item IDMTBC6 “*Consistent, reliable reporting, based on the full life cycle costs of infrastructure*” was always not experienced during stage 6 by 76.1% of respondents as it ranked the highest (m = 4.30). Emphasising that during stage 6, inconsistent and unreliable reporting by government was evident. Highlighted under work stage 2, this can lead to inaccurate performance tracking and budget allocation of projects if not addressed by government. Fifty-four percent of respondents ranked item IDMTBB6 “*Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes*” last (m = 3.91) as it was always absent. This suggests due to lack of capacity building identified under IDM principles, poorly skilled employees may not have the ability to effectively implement improved infrastructure delivery during work stage 6. The results in Table 9.25 depicts government are not achieving the IDM benefits during stage 6 of the FIDPM.

The Implementation of Benefits in the FIDPM Work Stage 7 – Close Out

In the final stage, 37.3% of respondents highlighted item IDMTBJ7 “*a structured environment...*” with a mean value of 3.19 was always absent. However, 131 (32%) of respondents noted they did not have negative encounters with this benefit as it was in fact experienced on public sector projects. This emphasises some respondents felt that the current environment is not structured for inexperienced delivery managers to excel and develop their skills in, while other respondents did not find issues with this benefit as their experiences may have been with experienced public sector employees who did create an environment for growth and development.

Furthermore, item IDMTBD7 “*development of programme plans...*” (m = 2.68) was present on public sector projects during stage 7 by 42.9% of respondents. However, a combined total of 174 (42%) of respondents indicated they this benefit was often or always absent. This suggests, once the project is in the close out stage, through the professional consultant team being primarily responsible for concluding the administrative requirements for the final stage, the role of public sector employees is minimal. As a result, this item was highlighted as present by some respondents while others did not experience this benefit due to limited public sector employee involvement. The dispersion of results in Table 9.25 indicated through limited public sector interface during the final stage, respondents noted some benefits were experienced, while some benefits were non-existent.

Table 9.25: The Implementation of Benefits in the FIDPM Work Stages 1 - 7

Work Stage		Stage 1			Stage 2			Stage 3			Stage 4			Stage 5			Stage 6			Stage 7		
Item No.	Description	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank	Mean	Std. Dev	Rank
IDMTBA	Understanding of delivery and procurement management processes including governance obligations.	4.06	1.16	2	4.02	1.26	2	3.99	1.22	10	4.49	1.01	7	4.11	0.94	6	4.01	1.12	10	3.07	1.09	5
IDMTBB	Improved control of infrastructure delivery, due to appropriate decision points within the delivery and procurement management processes.	3.43	1.13	10	3.92	1.35	7	3.97	1.22	11	4.47	1.06	8	4.27	0.96	1	3.91	1.35	12	3.08	1.19	4
IDMTBC	Consistent, reliable reporting, based on the full life cycle costs of infrastructure.	3.99	0.94	4	4.21	1.31	1	4.19	1.23	8	4.56	0.95	4	4.15	1.15	4	4.3	1.36	1	3.1	1.25	3
IDMTBD	Development of programme plans, using simple templates and guides.	3.91	1.05	5	3.69	1.63	10	4.15	1.34	9	4.47	1.17	8	4.21	1.12	2	4.17	1.4	5	2.68	1.66	12
IDMTBE	Alignment of the allocated budgets to infrastructure programmes.	4.06	0.99	2	3.87	1.36	9	4.27	1.06	6	4.53	1	5	4.13	1.2	5	3.94	1.33	11	2.69	1.67	11
IDMTBF	Improved management of the procurement of supplies, services and engineering and construction works.	3.74	1.09	7	4	1.4	3	4.26	1.17	7	4.5	1.11	6	4.13	1.1	5	4.08	1.26	9	3.05	1.35	6
IDMTBG	Improved oversight of the implementation of projects and performance of the contract administration functions including performance and risk management.	3.57	1.23	9	3.93	1.28	6	4.52	0.95	4	4.57	0.91	3	4.2	1.05	3	4.15	1.11	7	3	1.28	7
IDMTBH	Greater level of uniformity of infrastructure project implementation, across different organs of state.	3.69	1.06	7	3.94	1.28	5	4.56	0.93	2	4.6	0.93	2	4.04	1.26	10	4.22	0.98	2	2.98	1.37	8
IDMTBI	Greater level of certainty achieved within the construction industry of how programmes and projects are rolled out by the public sector.	3.58	1.29	8	3.9	1.32	8	4.53	0.98	3	4.56	0.95	4	4.08	1.21	7	4.2	1.12	3	2.97	1.37	9
IDMTBJ	A structured environment for inexperienced delivery managers to thrive and gain understanding well beyond their years of experience.	3.85	1.09	6	3.96	1.37	4	4.56	0.92	2	4.49	1.06	7	4.07	1.26	8	4.16	1.15	6	3.19	1.62	1
IDMTBK	Senior management will have a tool to hold delivery managers accountable for performance.	4.04	1.16	3	3.93	1.27	6	4.48	1.05	5	4.43	1.15	9	4.06	1.36	9	4.18	1.14	4	3.12	1.41	2
IDMTBL	The quality and value for money of service delivery will improve.	4.12	0.9	1	4	1.17	3	4.57	0.86	1	4.62	0.89	1	4.12	1.17	6	4.18	1.14	8	2.92	1.19	10

Principals and Benefits - Summary of Findings

The overall results of both sections of the last question highlighted that the IDM toolkits principals need to be effectively implemented in order to achieve the benefits offered. During the first stage, public sector involvement is minimal yet the principles, clarity of responsibility and accountability by public employees were not experienced. While capacity building was seldomly present. As the involvement of public employees increases in stage 2, clarity of responsibility and accountability by public employees was still non-existent. However, evidence of limited capacity building became apparent. In stage 3, where the regular and in-depth engagement exists with public sector employees, PMs identified that evidence base decision making including continuous Improvement were always absent. During the important and pivotal work stage 4, government needs to ensure capacity building and planning alignment are consistently implemented throughout the project stages. Stage 5 highlighted that public sector employees lacked capacity building including evidence base decision making and policy consistency as it these principals were always absent. The dispersion of the results in stage 6 suggested limited and questionable skills and knowledge base exhibited by public sector employees some principles were implemented, and some were not. Finally, the spread of the results during stage 7 indicated similar findings to those in stage 6, that limited and questionable skills and knowledge base were displayed by public sector employees.

Government's ability to implement the IDM toolkits principles during the seven FIDPM work stages are limited and lacking. The implementation of these principles by public sector employees are not extensively recognisable by PMs during the first 5 work stages. However, during that last two work stages some principles are noticeable but are not convincing. As a result of government not effectively implementing the principles, the benefits offered were not consistently achievable throughout the seven FIDPM work stages. The IDM toolkits principles need to be effectively implemented in order to achieve the benefits offered. Government needs to reinforce capacity building towards bolstering its skilled resource base. Further indicating, government needs to be geared up and ready to implement the principles of the IDM toolkit if the FIDPM is to be effectively implemented.

In addition, Question 6 emphasised PMs ability to apply IDM toolkits principals and benefits, suggesting the project management approach may assist in aiding government with the structured implementation of the FIDPM towards improving public service delivery.

9.2.5.1 Summary of Findings – PM Tools and Techniques

The findings for the PM tools and techniques driver were summarised as follows:

1. PM attributes can assist government with the implementation of the FIPDM towards improving service delivery.

2. PMs were identified as being in an opportune position to implement effective change towards assisting government improve service delivery on public sector projects.
3. Key skill sets of effective project managers should be used to assist government improve service delivery on public sector projects.
4. PMs can use their skills under the ten knowledge areas of expertise to assist government address service delivery challenges.
5. PMs were found to be in a position to assist government in achieving key institutional goals.
6. PMs agreed with applying the IDM toolkits principals in order to achieve the benefits through the FIDPM.
7. Finally, the implementation of the IDM toolkits principals and benefits were found to be not very effective by government as PMs felt these principles and benefits were always absent during seven FIDPM work stages.

9.2.5.2 Skewness and Kurtosis

The descriptive statistics of the final driver, PM Tool and Techniques depicted moderate and extreme levels of skewness amongst some items with the rest displaying negative skewness. Some items depicted extreme levels of kurtosis while most items were not overly kurtotic. The following items were removed from the data analysis as the standard deviations were equal to zero (skewness and kurtosis Table in Appendix H).

- *EWIC1 “*defining what has to be accomplished*” (Effective Ways of Introducing Change),
- *KSSEP1 “*technical project management*” (Key Skill Sets of Effective PM’s),
- *ESDC11 “*poor site management*” (Ten PM Areas of Expertise and Service Delivery Challenges),
- *ESDC12 “*time and cost variations*” (Ten PM Areas of Expertise and Service Delivery Challenges),
- *ESDC13 “*skills and competency issues*” (Ten PM Areas of Expertise and Service Delivery Challenges), and
- *KIG2 “*to be more efficient and effective*” (Key Institutional Goals).

This was a result of the responses for all respondents being equal, the term $(x_i - \bar{x})^2 = 0$. Every data value was equal to the mean. The results for these items indicated that all their values were identical. The data was distributed non-normally and required caution together with vigorous maximum likelihood estimation to be implemented.

9.3 Exploratory Factor Analysis Results

Authors such as Finch (2020), Pallant (2020) and Tabachnick and Fidell (2019) describe exploratory factor analysis (EFA) as a statistical technique used to reduce data to a smaller set of summary variables used to determine relationships between the variable and respondent. Exploratory factor analysis was used to test the reliability and validity of implications derived from the questionnaire and conceptual model. In addition, IBM SPSS Statistics 27 was used to conduct the EFA.

Prior to conducting the EFA, it was important to prepare the data through running key tests (Finch, 2020). These included:

- Data screening to ensure the data is usable, reliable, valid, and ready to use for testing,
- Checking of missing data, outliers, and unengaged responses including normality of the data to check skewness and kurtosis, and
- Multicollinearity which entailed checking if any variables were highly collated (Finch, 2020).

Furthermore, EFA was used to test adequacy convergent, validity, discriminant validity and reliability (Tabachnick and Fidell, 2019).

9.3.1 Dimension Reduction Process

The dimension reduction process involved deciding on the descriptive extraction, rotation scores and options. Three steps which were adopted when conducting factor analysis are highlighted by Pallant (2020), namely, (1) an assessment of the suitability of the data, (2) factor extraction and (3) factor rotation and interpretation.

Assessment of suitability of data

Saunders *et al.* (2019) highlighted in chapter 6 that a response rate between 30%-50% as appropriate and Collins and Hussey (2014) identified for studies where a population size is of 1000, a sample of 278 is required. Therefore, the response rate of 410 (34.59%) was considered adequate.

The strength of the intercorrelations amongst items including testing if the data is appropriate to conduct factor analysis was determined through implementing Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity. In addition, Bartlett's Test of Sphericity requires a significance ($p < 0.05$) (Hair *et al.* 2018). KMO was necessary to indicate factorability of a matrix (Pallant, 2020). According to Kaiser (1974), factorability of a matrix can be considered if it is above 0.5, anything less than 0.5 cannot be considered. Authors such as Field, (2000), Hutcheson and Sofroniou (1999), Kaiser (1974) and Pallant (2020) illustrates KMO measures of sampling adequacy presented in Table 9.26. The minimum acceptable threshold adopted in this study was 0.60.

Table 9.26: KMO Measures of Sampling Adequacy (Field, 2000; Hutcheson and Sofroniou, 1999; Kaiser, 1974; Pallant, 2020)

Measure	Sampling Adequacy
0.00 to 0.49	Unacceptable
0.50 to 0.59	Miserable
0.60 to 0.69	Mediocre
0.70 to 0.79	Middling
0.80 to 0.89	Meritorious
0.90 to 1.00	Marvellous

Factor extraction

This study implemented the Maximum Likelihood extraction method with the Promax Rotation as it maximises the differences between factors including providing model fit estimates. This was important as it is also compatible with Amos Version 26, which is used for the confirmatory factor analysis (CFA) and the structural model (Finch, 2020). The degree of variance was explained using Kaiser's criterion (Eigenvalue greater than one rule) (Pallant, 2020). The KMO values range from 0-1 where values above 0.60 indicated the minimum threshold for factorability (Tabachnick and Fidell, 2019). In addition, the Eigenvalue was also utilised test the data where eigenvalues greater than one are interpreted as significant (Hair *et al.* 2018). Finally, Catell's scree test was included to view dimensionality diagrammatically (Pallant, 2020).

Factor rotation and interpretation

Interpretation of the data is further assisted by rotating the factors where their underlying solution is not altered, however, their communalities including eigenvalues although unchanged are presented to enable easier interpretation (Hair *et al.* 2018). Maximum Likelihood extraction method with the Promax Rotation was implemented in this study as a method for factor extraction.

The analysis of this study was divided into three drivers, mainly, (1) public sector, (2) government policies, frameworks and the FIDPM, and (3) project management tools and techniques.

9.3.2 The Public Sector

The public sector driver comprised seven unobserved variables, namely:

1. Recurring problems (RPPS),
2. Public service transformation strategies (PSTS),
3. Government initiatives (GI),
4. Batho Pele principles (BPP),
5. Service delivery challenges (SDC),
6. Government processes and decision making (GPDM), and

7. Management strategies for service delivery (MSSD).

Item SDC15 “*skills and competency issues*” was removed after the covariance matrix was not positive definitive because it was singular, highlighting that at least one of the variables can be expressed as a linear combination of the others. As a result, there was no need of all the variables as the value of at least one can be determined from a subset of the others. A second run was done after the removal of the mentioned item.

The KMO for the public sector was 0.835 which was greater than 0.5 and Bartlett’s test of sphericity indicated a significance of 0.000 ($p < 0.00$) as illustrated in Table 9.27. The data was appropriate to conduct factor analysis through the indicative strength of the item correlation values.

Table 9.27: KMO and Bartlett’s Test – Public Sector

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.835
Bartlett's Test of Sphericity	Approx. Chi-Square	18835.759
	df	946
	Sig.	.000

Communalities for the public sector are presented in Table 9.28. According to Pallant (2020), communalities are used to improve or refine the scale and explain variance. In addition, item communality involves a numerical measure of how much an items variance is being capture by the factor model (Brown, 2015). Communalities between 0.25 and 0.4 are suggested as acceptable cut-off values, with ideal communalities being 0.7 (Beavers, Loundsbury, Richards, Huck, Skolits and Esquivel, 2013). When the values are below 0.3, they are considered low which may indicate that the item do not fit well with other items under its factor. As a result, removing low values increases the total variance explained (Pallant, 2020). When communality values are excessively high (0.999 or equal to 1) SPSS usually issues a warning as it is assumed, no single item may reflect more than 90% of true variance in social sciences (Pallant, 2020).

Stricter cut-off values entail better model fit with the items retained. However, choosing smaller cut-off values for item communality results in models with a poor fit when compared to ones which utilised stricter cut-off values (Eaton, Frank, Johnson and Willoughby, 2019). Usually, models generated will have varying levels of goodness of fits with data as it depends on the strictness of the cut-off values selected. However, a balance is required as stricter cut-off values may result in fewer items being retained within the model. Therefore, cut-off values should be selected to allow a generated model to fit the data well while retaining an acceptable number of items from the assessment (Pallant, 2020; Tabachnick and Fidell, 2019).

Table 9.28 reflected communalities which indicate high values that fell within the acceptable range (>0.999 or equal to 1) including low values. The low values were retained to ensure the generated model under the CFA section fits the data well and retains an acceptable number of items from the assessment (Pallant 2020; Tabachnick and Fidell, 2018).

Table 9.28: Communalities – Public Sector

Communalities ^a				
No.	Item Ref.	Item Description	Initial	Extraction
Recurring Problems in the Public Sector				
1	RPPS1	Resource optimisation...	.363	.328
2	RPPS2	The root causes of problems...	.503	.463
3	RPPS3	Consistent recurrence of findings.	.230	.104
Public Service Transformation Strategies				
1	PSTS1	Identify services and target populations...	.953	.969
2	PSTS2	Develop a culture of customer care...	.878	.852
3	PSTS3	Generate mission statements...	.954	.992
4	PSTS4	Set definite service standards...	.899	.893
5	PSTS5	Manage service delivery by means ...	.907	.866
Government Initiatives				
1	GI1	Suitable infrastructure and logistics.	.906	.931
2	GI2	Competitive input prices.	.771	.740
3	GI3	Skills and technology.	.875	.871
4	GI4	Innovation and partnerships.	.949	.940
5	GI5	Efficient regulation.	.896	.899
6	GI6	Effective government offerings.	.980	.999
7	GI7	Equitability.	.904	.924
8	GI8	Accountability. (removed as std. dev. = 0)		
9	GI9	Improving Performance Management.	.935	.934
Batho Pele Principles				
1	BPP1	Consultation – citizens should be consulted about their needs.	.962	.968
2	BPP2	Standards – all citizens should know what service to expect.	.908	.982
3	BPP3	Redress – all citizens should be offered...	.945	.934
4	BPP4	Access – all citizens should have equal access to services.	.948	.947
5	BPP5	Courtesy – all citizens should be treated courteously.	.897	.894
6	BPP6	Information – all citizens are entitled to full, accurate information.	.913	.917
7	BPP7	Openness and Transparency – all citizens should know...	.857	.835
8	BPP8	Value for Money – all services provided should offer value for money.	.843	.833
Service Delivery Challenges				
1	SDC1	Political issues.	.337	.258
2	SDC2	Policy issues.	.405	.377
3	SDC3	Implementation issues.	.339	.278
4	SDC4	Prolonged procurement processes...	.610	.549
5	SDC5	Acute problems of institutional capacity.	.403	.326
6	SDC6	Mismanagement of funds.	.497	.409
7	SDC7	High levels of corruption.	.507	.437
8	SDC8	A lack of public participation.	.637	.563
9	SDC9	Absence of people centred culture...	.553	.517
10	SDC10	Training and development programs...	.636	.600
11	SDC11	Lack of effective monitoring...	.520	.124
12	SDC12	Strategic planning activities on service...	.866	.891
13	SDC13	Poor site management from public servants.	.981	.997
14	SDC14	Time and cost variations.	.987	.994
15	SDC15	Skills and competency issues. (removed, not positive definitive)		
Government Processes and Decision Making				
1	GPDM1	Detailed regulation and central prescription...	.117	.025
2	GPDM2	Service deliverers are currently...	.163	.051

3	GPDM3	Implementing robust risk assessments...	.152	.050
Management Strategies for Service Delivery				
1	MSSD1	Development of more flexible regulatory frameworks.	.557	.502
2	MSSD2	Improvement of human resource management systems.	.195	.062
3	MSSD3	Development of more results-oriented management systems.	.161	.040

Extraction Method: Maximum Likelihood.

The Total Variance Explained (TVE) is required to be greater than 50%, while 60% was the minimum acceptable threshold adopted for this study. This was supported by Hair *et al.* (2018) who indicated that the acceptable variance explained in factor analysis for a construct to be valid is 60%. Table 9.29 illustrated that the Total Variance Explained for the public sector indicated 10 factors emerged with factors greater than 1 which explained a 73.01% of the variance and could therefore be considered valid. Furthermore, Figure 9.4 exemplifies the scree plot.

Table 9.29: Total Variance Explained – Public Sector

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	9.953	22.622	22.622	6.487	14.743	14.743	7.456
2	6.991	15.888	38.510	6.101	13.867	28.610	5.821
3	4.689	10.656	49.165	4.792	10.891	39.501	7.121
4	2.387	5.425	54.590	4.004	9.100	48.601	6.057
5	2.149	4.883	59.474	1.638	3.723	52.325	6.195
6	1.513	3.439	62.913	2.430	5.523	57.848	3.074
7	1.207	2.743	65.656	1.161	2.639	60.487	1.683
8	1.140	2.592	68.248	.639	1.452	61.939	2.062
9	1.068	2.426	70.674	.401	.912	62.851	2.144
10	1.044	2.374	73.048	.384	.872	63.723	1.603

Extraction Method: Maximum Likelihood.

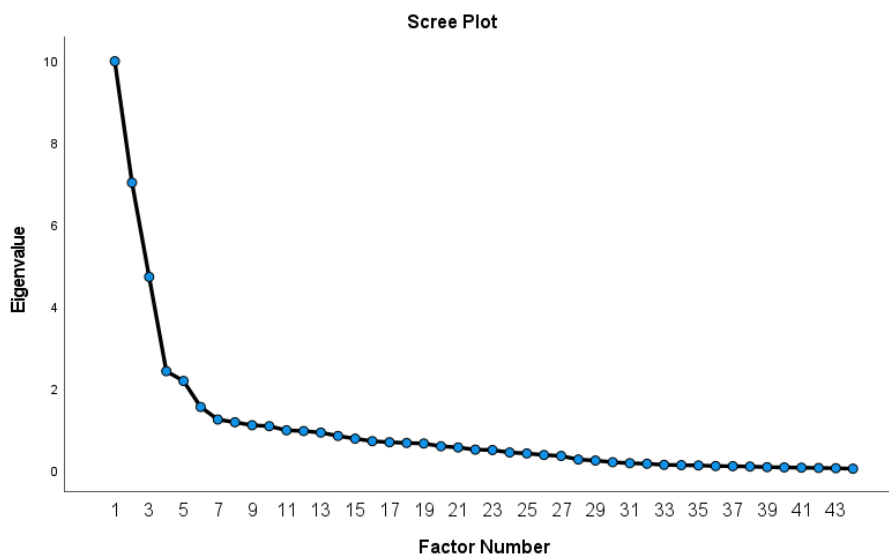


Figure 9.4: Scree Plot – Public Sector

Table 9.30 presents the pattern matrix for the retained factors for the public sector.

A pattern matrix coefficient entails a series of standardised regression coefficients which express the variable as a function of factor loadings (Finch, 2020). The direction of the relationship between a pair of variables are indicated by correlations which values range between -1 and +1 and the factor loadings generally illustrate relevance in defining the factors dimensionality (Pallant, 2020). Loadings between 0.3 and 0.4 are considered to meet the minimum level of interpretation, provided the sample size is greater than 350 (Patel, 2015). This was supported by Pallant (2020) that correlation coefficients should be >0.3 . As a result, based on the sample of 410 in this study, >0.3 was adopted as the minimum threshold.

However, negative factor loadings are important as positive factor loadings (Mindrila, Zhu & DiStefano, 2009). According to Schwartz (1971), factor loadings vary between -1,00 to 1,00 and are easily interpreted. Whether positive or negative the loading value simply expresses the correlation between the variables and the factors (Schwartz, 1971:38). The negative sign of the loading is not an indication of the strength of the variable to the factor, rather, it gives meaning that the variable is related in the opposite direction with the factor (Asnawai, Gravell & Wills, 2012; De Vaus, 2002). Jaskaluk (2016) and Mindrila *et al.* (2009) further notes that negative factor loadings indicate that the unobserved variable is not unidimensional to the construct and is therefore the relationship is interpreted accordingly. Each row of the matrix depicts a regression equation where the standardised observed variable is expressed as a function of the factors (Pallant, 2020). Uncorrelated factors depict identical pattern and structure coefficients. The stronger the correlation of factors, the two types of coefficients become less alike. Therefore, the pattern matrix describes each items unique relationships to each factor (Tabachnick and Fidell, 2019).

Table 9.30 presented the pattern matrix for the public sector driver. The factor analysis entailed maximum likelihood (ML) extraction which was used with Kaiser Normalisation including Promax rotation. Coefficients were suppressed with an absolute value below 0.5 and the factors returned were based on the number of interpretable factors. Eigenvalues greater than one yielded 10 factors which loaded 36 out of 46 items.

Factor 1 loaded 9 items. Five items, namely, PSTS1, PSTS2, PSTS3, PSTS4 and PSTS5 related to public service transformation strategies emphasising that these are fundamental elements under this unobserved variable which need to be implemented to achieve transformation of strategies in the public service. This was supported by the White Paper on Transforming Public Service Delivery (1997) which clearly highlighted that government is guided by the ideals of the constitution for public service and promotes the definite need to develop strategies for continuous improvement of service delivery. In

addition, one item BPP2 related to Batho Pele principles. This emphasised that “*standards...*” need to be incorporated in public sector service delivery implementation. The performance outcomes reported by the PSC (2000), Batho Pele Policy Review (2003), PSC (2008) and DPSA (2018) emphasised poor implementation of Batho Pele standards on public sector projects. Three items SDC9 “*absence of people centred culture...*”, SDC10 “*training and development...*” and SDC12 “*strategic planning activities on...*” loaded negatively indicating they share a relationship in the opposite direction to the absolute value and are considered important service delivery challenges. Masiya *et al.* (2019) and Manyathi *et al.* (2021) have stressed various challenges facing service delivery including absence of people centred culture, training and development and a lack of strategic planning activities. The results indicated that factor 1 is not unidimensional due to negative factor loadings. As a result, factor 1 can be described as “*Public service transformation strategies, initiatives and Batho Pele principles*” and may also be considered as “*service delivery challenges*”.

Factor 2 loaded 6 items. Two items, namely, GI1 and GI9 related to government initiatives, suggesting suitable infrastructure and logistics including improving performance management are key government initiatives required in the public sector. Fourie (2014) supports this by noting that improving service delivery is a critical factor to be initiated by government for growing and developing the country’s economy. Items BPP1 and BPP3 related to Batho Pele principles emphasising further that consultation and redress need to be implemented by the public sector. The performance Batho Pele Policy Review (2003) and DPSA (2018) emphasised poor implementation of Batho Pele consultation and redress on public sector projects. Item PSTS4 loaded negatively under transformation strategies in the public service suggesting that factor 2 is not unidimensional. However, the positive value for this item which loaded under factor one was retained as it indicated a stronger relationship towards the absolute value. The last item, MSSD1 indicated that the development of flexible regulatory frameworks was highlighted as fundamental to ensuring management strategies are implemented for service delivery. The South African public service aligns with international best practice requirements regarding legislature and policy, however, more flexible regulatory frameworks are to be developed for enhancing service delivery (Republic of South Africa, 1996). Factor 2 can be described as “*Government initiatives and Batho Pele principles towards service delivery*”.

Factor 3 loaded 5 items, namely, BPP3, BPP4, BPP5, BPP6 and BPP7 which highlighted that access, courtesy, information, openness and value for more were all important principles required for implementation by the public sector. These principles need to be implemented in order to ensure Batho Pele principles are achieved. Poor implementation of Batho Pele principles on public sector projects were reported by the the PSC (2000), Batho Pele Policy Review (2003), PSC (2008) and DPSA (2018) further highlighting the need for government to start adhering to these principles in order to address public service delivery. As a result, factor 3 may be described as “*Batho Pele principles*”.

Factor 4 loaded 5 items. Two items, namely, GI4 and GI6 which depicted that skills and technology including effective government offerings are important components for achieving government initiatives. Furthermore, items SDC1, SDC2 and SDC3 illustrated negative loadings, namely, political issues, policy issues and implementation issues indicating they correlate in the opposite direction to the absolute value and were interpreted as important service delivery challenges in the public sector. Factor 4 is not unidimensional due to negative factor loadings and can therefore be described as, “*Government initiatives for improved service delivery*” and “*Public sector service delivery challenges*”.

Factor 5 loaded 4 items. Item RPPS1 loaded negatively illustrating a relationship in the opposite direction to the absolute value which suggests resource optimization is still a serious recurring problem in the public sector. This was supported by Akinboade *et al.* (2012), Francis (2013) and Janse van Rensburg (2014) who highlighted that poor human resource practices hinder service delivery which is of great concern in the public sector and needs serious attention by government.

Three items, namely, GI3, GI5 and GI7 indicated that skills and technology, efficient regulation and effective government offerings are key components for achieving government initiatives. The South African Constitution further emphasises failure to provide these services would result in a violation of the right to have access to basic services and a better life (Crous, 2004; Mashamaite, 2014; Nengwakhulu, 2009; Wilson, 2012). As a result, it is critical for government initiatives to be put in place and be taken seriously towards improving service delivery. The negative loading is indicative that factor 5 is not unidimensional and may therefore be described as “*Recurring resource optimization problems in the public sector*” and “*Government initiatives in the public sector*”.

Factor 6 loaded 2 items, SDC13 and SDC14 relating to service delivery challenges. Factor 7 loaded 1 item, SDC 6 indicating that mismanagement of funds was an important challenge relating to service delivery. Factor 8 loaded 1 item, RPPS2 which loaded negatively highlighting correlation in the opposite direction to the absolute value. Factor 9 loaded 1 item, BPP2 which displayed a negative loading and was not retained, as this item had already loaded under factor 1. Factor 10 loaded 1 item, GPDM2.

Watkins (2018) highlighted that at least three measured variables are needed for statistical analysis, therefore factors 6, 7, 8, 9 and 10 had less than three variables which were considered weak and were dropped.

The correlation values further illustrated in Table 9.30 between most of the listed items and the public sector driver displayed were high (closest to 1) and confirmed convergent validity. In addition, Kline

(2016) noted that correlation values <0.9 indicate discriminant validity. With the exception of items GI3 and GI3, the scale met the requirements for discriminant validity. The public sector driver met the requirements for the internal reliability criteria, however, the low correlations were acknowledged and interpreted with caution.

Table 9.30: Pattern Matrix – The Public Sector

Pattern Matrix ^a												
No.	Item Ref.	Item Description	1	2	3	4	5	6	7	8	9	10
Recurring Problems in the Public Sector												
1	RPPS1	Resource optimisation...					-0.582					
2	RPPS2	The root causes of problems...								-0.589		
3	RPPS3	Consistent recurrence of findings.										
Public Service Transformation Strategies												
1	PSTS1	Identify services and target ...	.868									
2	PSTS2	Develop a culture of customer care...	.612									
3	PSTS3	Generate mission statements...	.815									
4	PSTS4	Set definite service standards...	.717	-0.611								
5	PSTS5	Manage service delivery by means ...	.841									
Government Initiatives												
1	GI1	Suitable infrastructure and logistics.		.952								
2	GI2	Competitive input prices.										
3	GI3	Skills and technology.					1.006					
4	GI4	Innovation and partnerships.				.962						
5	GI5	Efficient regulation.					1.008					
6	GI6	Effective government offerings.				.997						
7	GI7	Equitability.					.717					
8	GI8	Accountability.										
9	GI9	Improving Performance Management.		.999								
Batho Pele Principles												
1	BPP1	Consultation...		.792								
2	BPP2	Standards...	.583								-0.545	
3	BPP3	Redress...		.830								
4	BPP4	Access...			.833							
5	BPP5	Courtesy...			.925							
6	BPP6	Information...			.968							
7	BPP7	Openness...			.786							
8	BPP8	Value for Money...			.924							
Service Delivery Challenges												
1	SDC1	Political issues.				-0.529						
2	SDC2	Policy issues.				-0.660						
3	SDC3	Implementation issues.				-0.505						
4	SDC4	Prolonged procurement processes...										
5	SDC5	Acute problems of institutional...										
6	SDC6	Mismanagement of funds.							.638			
7	SDC7	High levels of corruption.										
8	SDC8	A lack of public participation.										
9	SDC9	Absence of people centred culture...	-0.625									
10	SDC10	Training and development...	-0.669									
11	SDC11	Lack of effective monitoring...										
12	SDC12	Strategic planning activities on...	-0.800									
13	SDC13	Poor site management from public...						.891				
14	SDC14	Time and cost variations...						.749				
15	SDC15	Skills and competency...										
Government Processes and Decision Making												
1	GPDM1	Detailed regulation and central...										

1	EPI1	Departments not having ...	.545	.569
2	EPI2	Service standards not ... (removed, high communalities)		
3	EPI3	Too much emphasis ... (removed, high communalities)		
4	EPI4	Service standards were ...	.810	.935
5	EPI5	Members of staff were often ...	.772	.927
6	EPI6	Certain departments ... (removed, high communalities)		
7	EPI7	Little understanding ... (removed, not positive definitive)		
8	EPI8	Not linking the concept... (removed, high communalities)		
SCM Public Procurement Challenges				
1	SCMPPC1	Lack of proper knowledge...	.506	.617
2	SCMPPC2	Non-compliance...	.494	.601
3	SCMPPC3	Inadequate planning... (removed, high communalities)		
4	SCMPPC4	Accountability...	.283	.294
5	SCMPPC5	Inadequate monitoring ...	.186	.176
6	SCMPPC6	Too much decentralisation ...	.561	.698
7	SCMPPC7	Ineffectiveness of the black...	.291	.287
IDMS, SIPDM & FIDPM				
1	ISF1	IDMS... (removed, not positive definitive)		
2	ISF2	SIPDM... (removed, not positive definitive)		
3	ISF3	FIDPM... (removed, not positive definitive)		
Government Ability to Apply the FIDPM (Principles)				
1	GAAFP1	Policy consistency...	.359	.452
2	GAAFP2	Planning alignment... (removed, not positive definitive)		
3	GAAFP3	Clarity of responsibility... (removed, not positive definitive)		
4	GAAFP4	Evidence-based decision...	.273	.314
5	GAAFP5	Continuous improvement...	.378	.563
6	GAAFP6	Continuous capacity... (removed, not positive definitive)		
Government Ability to Apply the FIDPM (Benefits)				
7	GAAFB1	Understanding of delivery...	.393	.431
8	GAAFB2	Improved control... (removed, high communalities)		
9	GAAFB3	Consistent, reliable...	.561	.717
10	GAAFB4	Development of programme...	.619	.707
11	GAAFB5	Alignment of the allocated...	.459	.483
12	GAAFB6	Improved management...	.342	.341
13	GAAFB7	Improved oversight...	.393	.354
14	GAAFB8	Greater level of uniformity...	.568	.780
15	GAAFB9	Greater level of certainty...	.176	.172
16	GAAFB10	A structured environment...	.373	.420
17	GAAFB11	Senior management... (removed, high communalities)		
18	GAAFB12	The quality and...	.401	.695

Extraction Method: Maximum Likelihood.

Seven factors with eigenvalues greater than 1 were illustrated in Table 9.33 which explained 62.1% of the variance and was considered valid. Figure 9.5 illustrated the scree plot.

Table 9.33: Total Variance Explained - Government Policies, Frameworks and the FIDPM

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	4.305	17.221	17.221	3.301	13.204	13.204	3.092
2	3.326	13.304	30.526	3.108	12.432	25.635	2.216
3	2.393	9.572	40.098	1.858	7.431	33.066	2.806
4	1.756	7.025	47.123	1.422	5.688	38.754	2.335
5	1.477	5.907	53.030	1.291	5.163	43.917	2.330

6	1.254	5.017	58.047	.762	3.046	46.963	1.620
7	1.021	4.086	62.133	.528	2.112	49.075	1.364

Extraction Method: Maximum Likelihood.

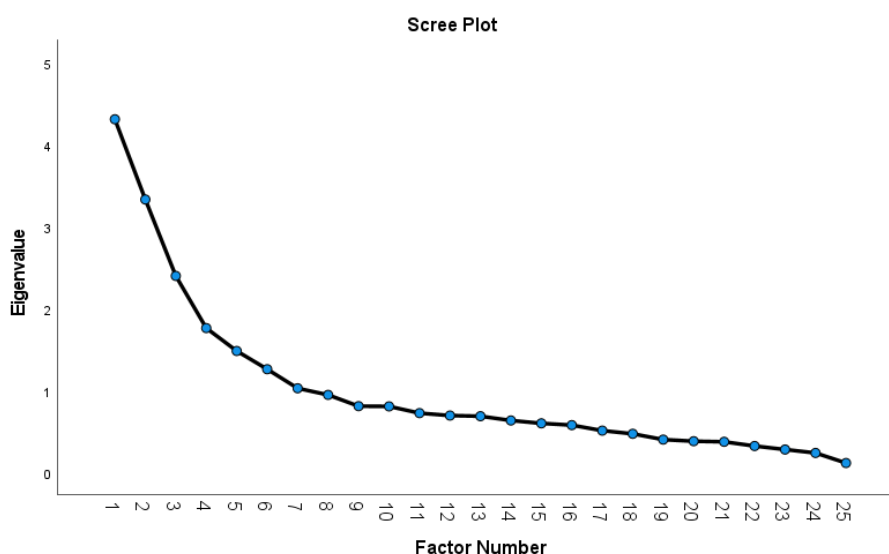


Figure 9.5: Scree Plot – Government Policies, Frameworks and the FIDPM

Table 9.34 presented the pattern matrix for the government policies, frameworks and the FIDPM driver. The factor analysis entailed maximum likelihood (ML) extraction which was used with Kaiser Normalisation including Promax rotation. Coefficients were suppressed with an absolute value below 0.5 and the factors returned were based on the number of interpretable factors. Eigenvalues greater than one yielded 7 factors which loaded 16 out of 39 items.

Factor 1 loaded 4 items, namely, GAAFB2, GAAFB3, GAAFB4 and GAAFB8 which illustrated that consistent and reliable, development of programme plans and a greater level of uniformity of infrastructure where important benefits required to be implemented by government towards ensuring the successful implementation of the FIDPM. However, item GAAFB8 loaded a higher correlation value under factor 7 indicating a stronger relationship with the greater level of uniformity and government’s ability to apply the FIDPM benefits. The IDMS principles and benefits aim to assist in successful and robust policy implementation (IDMS, 2019). The FIDPM (2019) further emphasised governments inefficiencies are directly impacting the effective implementation of the FIDPM towards improved service delivery. Therefore, factor 1 can be described as “*Government’s ability to apply FIDPM benefits*”.

Factor 2 loaded 2 items. The first item, PDI1 loaded negatively suggesting correlation in the opposite direction to the absolute value which indicated that current policy is not in alignment with policy development and implementation. The second item, SCMPPC6 related to supply chain public

procurement challenges indicating that too much decentralisation of the procurement system is an important challenge for SCM to address.

Factor 3 loaded 3 items, namely, EPI1, EPI4 and EPI5 relating to effective policy implementation, suggesting that departments not having service standards, service standards sometimes being unachievable, and members of staff were often uninformed regarding their departments service standards were important towards ensuring government implements policy effectively. The PSC (2005), PSC (2010), PSC (2015) and PSC (2018) service delivery evaluation reports highlighted that these critical challenges remain through the development and use of service standards to access service delivery. This is of serious concern and requires urgent corrective intervention by government. Therefore, factor 3 can be described as “*effective policy implementation*”.

Factor 4 loaded 2 items, SCMPPC1 and SCMPPC2 relating to supply chain public procurement challenges which highlighted that a lack of proper knowledge and non-compliance by public sector SCM employees are critical challenges for government to address. Factor 5 loaded 2 items, namely, GAAFP1 and GAAFP5 relating to government ability to apply FIDPM principles. Factor 6 loaded 2 items, GAAFB10 and GAAFB12 depicting that a structured environment for inexperienced delivery managers to thrive and the quality and value for money of service delivery will improve were fundamental benefits for government to apply through the FIDPM.

Factors 2, 4, 5, 6 and 7 were dropped because they had less than three measured variables (Watkins, 2018).

In addition, Table 9.34 presented the correlation values for government policies, frameworks and the FIDPM and indicated that they are correlated. Item PDI1 displayed a negative loading indicating a low correlation, while the correlation values for the remaining items ranged from -.615 to .856 and met the requirements for discriminant validity. Therefore, this construct satisfied the internal reliability criteria and the construct validity criteria.

Table 9.34: Pattern Matrix – Government Policies, Frameworks and the FIDPM

Pattern Matrix ^a									
No.	Item Ref.	Item Description	1	2	3	4	5	6	7
Policy Development and Implementation									
1	PDI1	Current policy development...		-.615					
2	PDI2	Government is good at policy...							
3	PDI3	The infrastructure delivery...							
Effective Policy Implementation									
1	EPI1	Departments not having ...			.856				
2	EPI2	Service standards not ...							
3	EPI3	Too much emphasis ...							

4	EPI4	Service standards were ...			.820				
5	EPI5	Members of staff were often ...			.626				
6	EPI6	Certain departments ...							
7	EPI7	Little understanding ...							
8	EPI8	Not linking the concept...							
SCM Public Procurement Challenges									
1	SCMPPC1	Lack of proper knowledge...				.796			
2	SCMPPC2	Non-compliance...				.789			
3	SCMPPC3	Inadequate planning...							
4	SCMPPC4	Accountability...							
5	SCMPPC5	Inadequate monitoring ...							
6	SCMPPC6	Too much decentralisation ...			.825				
7	SCMPPC7	Ineffectiveness of the black...							
IDMS, SIPDM & FIDPM									
1	ISF1	IDMS...							
2	ISF2	SIPDM...							
3	ISF3	FIDPM...							
Government Ability to Apply the FIDPM (Principles)									
1	GAAFP1	Policy consistency...					.668		
2	GAAFP2	Planning alignment...							
3	GAAFP3	Clarity of responsibility...							
4	GAAFP4	Evidence-based decision...							
5	GAAFP5	Continuous improvement...					.788		
6	GAAFP6	Continuous capacity...							
Government Ability to Apply the FIDPM (Benefits)									
7	GAAFB1	Understanding of delivery...							
8	GAAFB2	Improved control...							
9	GAAFB3	Consistent, reliable...		.853					
10	GAAFB4	Development of programme...		.840					
11	GAAFB5	Alignment of the allocated...		.636					
12	GAAFB6	Improved management...							
13	GAAFB7	Improved oversight...							
14	GAAFB8	Greater level of uniformity...		.569					.657
15	GAAFB9	Greater level of certainty...							
16	GAAFB10	A structured environment...						.553	
17	GAAFB11	Senior management...							
18	GAAFB12	The quality and...						.814	

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalisation.^a

The next section discusses project management tools and techniques.

9.3.4 Project Management Tools and Techniques

The project management tools and techniques driver comprised of seven unobserved variables, namely:

1. PM attributes (PMA),
2. Effective way of introducing change (EWIC),
3. Key skill sets of effective PM's (KSSEP),
4. Ten PM areas of expertise and service delivery challenge (ESDC),
5. Key institutional goals (KIG),
6. Application of IDM toolkits principles and benefits by PM's (AITP/B) and
7. Implementation of IDM toolkits principles and benefits in FIDPM work stages (IDMTB/P).

The seventh unobserved variable IDMTB/P “*implementation of IDM toolkits...*” covered seven work stages and seemed to be challenging when it was combined with the other unobserved variables by producing a very low KMO of 0.328 with very high communalities. As a result, it was separated from the other six unobserved variables and factor analysed separately.

In addition, items KIG2 “*to be more efficient and effective*” and AITB12 “*the quality and value for money*” were both removed as the matrix was not positive definitive. The analysis was then re-run and the results presented in Table 9.35. The KMO score was 0.834 for the first six unobserved variables which is meritorious and depicted an acceptable significance of 0.00 ($p < 0.00$), implying that data could be factor analysed.

Table 9.35: KMO and Bartlett’s Test – PM Tools and Techniques (six unobserved variables)

KMO and Bartlett's Test			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.			.834
Bartlett's Test of Sphericity	Approx. Chi-Square		8160.384
	df		1225
	Sig.		.000

Table 9.36 illustrates the communalities, which entailed high and low values. However, no items were removed.

Table 9.36: Communalities – PM Tools and Techniques (six unobserved variables)

Communalities ^a				
No.	Item Ref.	Item Description	Initial	Extraction
PM Attributes				
1	PMA1	Ability to select and develop...	.499	.474
2	PMA2	Leadership and management...	.400	.393
3	PMA3	Ability to anticipate problems...	.497	.488
4	PMA4	Ability to integrate ...	.504	.518
5	PMA5	Operational flexibility...	.577	.589
6	PMA6	Ability to plan, expedite ...	.449	.461
7	PMA7	Ability to negotiate ...	.470	.475
8	PMA8	Understand the environment ...	.378	.416
9	PMA9	Ability to review, monitor...	.645	.671
10	PMA10	Ability to administer...	.611	.664
11	PMA11	The ability to keep...	.574	.552
Effective Ways of Introducing Change				
1	EWIC1	Defining what has to be... (removed as std. dev. = 0)		
2	EWIC2	Developing a plan to...	.666	.999
3	EWIC3	Using appropriate project...	.243	.220
4	EWIC4	Employing persons skilled...	.847	.955
Key Skill Sets of Effective PM’s				
1	KSSEP1	Technical Project Management... (removed as std. dev. = 0)		
2	KSSEP2	Leadership...	.224	.202
3	KSSEP3	Strategic and Business...	.693	.999
Ten PM Areas of Expertise and Service Delivery Challenges				
1	ESDC1	Policy issues. ...	.622	.686

2	ESDC2	Implementation issues...	.469	.560
3	ESDC3	Prolonged procurement...	.446	.471
4	ESDC4	Acute problems...	.571	.650
5	ESDC5	Mismanagement...	.756	.807
6	ESDC6	A lack of public...	.714	.730
7	ESDC7	Absence of people...	.781	.835
8	ESDC8	Training and development...	.406	.380
9	ESDC9	Lack of effective...	.372	.333
10	ESDC10	Strategic planning...	.394	.439
11	ESDC11	Poor site management... (removed as std. dev. = 0)		
12	ESDC12	Time and cost... (removed as std. dev. = 0)		
13	ESDC13	Skills and competency... (removed as std. dev. = 0)		
Key Institutional Goals				
1	KIG1	To be more responsive...	.310	.290
2	KIG2	To be more efficient... (removed, not positive definitive)		
3	KIG3	To be more representative...	.431	.487
4	KIG4	To improve access to services...	.360	.459
5	KIG5	To be more flexible...	.441	.443
6	KIG6	To remove the command...	.764	.999
7	KIG7	To have the ability to...	.648	.711
8	KIG8	To better utilise...	.481	.524
Application of IDM Toolkits Principles by PM's (Principles)				
1	AITP1	Policy consistency...	.510	.495
2	AITP2	Planning alignment...	.162	.099
3	AITP3	Clarity of responsibility...	.220	.195
4	AITP4	Evidence-based decision making...	.179	.197
5	AITP5	Continuous improvement...	.159	.134
6	AITP6	Continuous capacity...	.200	.156
Application of IDM Toolkits Benefits by PM's (Benefits)				
1	AITB1	Understanding of delivery...	.497	.555
2	AITB2	Improved control of...	.280	.231
3	AITB3	Consistent, reliable ...	.380	.487
4	AITB4	Development of...	.318	.330
5	AITB5	Alignment of the...	.298	.336
6	AITB6	Improved management...	.378	.364
7	AITB7	Improved oversight...	.310	.317
8	AITB8	Greater level of uniformity...	.037	.027
9	AITB9	Greater level of certainty...	.427	.454
10	AITB10	A structured environment...	.323	.316
11	AITB11	Senior management...	.243	.185
12	AITB12	The quality and value... (removed, not positive definitive)		

Extraction Method: Maximum Likelihood.

The results in Table 9.37 indicated 12 eigenvalues greater than 1 which explained 60.1% of the variance.

Figure 9.6 presented the scree plot.

Table 9.37: Total Variance Explained – PM Tools and Techniques (six unobserved variables)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.213	14.427	14.427	3.432	6.864	6.864	4.968
2	4.698	9.395	23.822	3.442	6.885	13.749	4.809
3	3.520	7.040	30.862	1.868	3.735	17.484	4.294
4	3.255	6.509	37.371	3.559	7.119	24.603	2.352
5	2.538	5.077	42.448	3.160	6.320	30.923	3.940

6	1.759	3.519	45.967	2.459	4.918	35.840	2.516
7	1.366	2.731	48.698	1.940	3.879	39.719	3.095
8	1.335	2.669	51.367	1.702	3.404	43.123	2.418
9	1.161	2.322	53.689	.694	1.388	44.511	2.604
10	1.068	2.136	55.825	.585	1.170	45.681	2.734
11	1.039	2.078	57.903	.465	.930	46.611	2.291
12	1.021	2.042	60.945	.451	.902	49.514	2.793

Extraction Method: Maximum Likelihood.

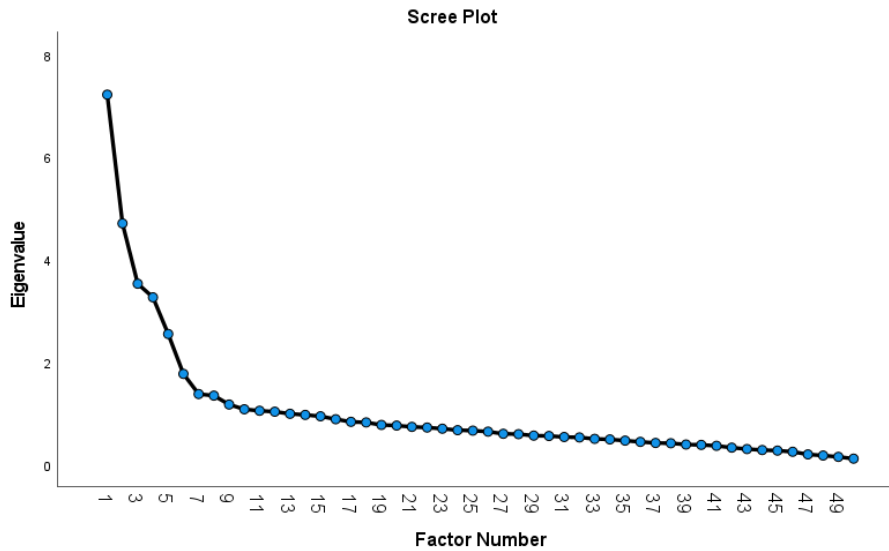


Figure 9.6: Scree Plot – Project Management Tools and Techniques (six unobserved variables)

Table 9.38 illustrated the pattern matrix for the PM tools and techniques driver. The factor analysis entailed maximum likelihood (ML) extraction which was used with Kaiser Normalisation including Promax rotation. Coefficients were suppressed with an absolute value below 0.5 and the factors returned were based on the number of interpretable factors. Eigenvalues greater than one yielded 12 factors which loaded 34 out of 77 items for the first six unobserved variables.

Factor 1 loaded 10 items, namely PMA1, PMA2, PMA3, PMA4, PMA5, PMA6, PMA7, PMA8, PMA9 and PMA10 indicating that the ability to select and develop, leadership and management, ability to anticipate problems, ability to integrate, operational flexibility, ability to plan, expedite, ability to negotiate, understand the environment, ability to review, monitor and the ability to administer are critical attributes to project managers and are key to the PM tools and techniques driver. Burke (2019) further illustrated that the appointment of the PM can influence the success or failure of a project and, as the single point of responsibility, the PM through the attributes they exhibit will guide a project to successful completion. As a result, factor 1 can be described as “*PM attributes*”.

Factor 2 loaded 7 items, AITM1, AITM3, AITM4, AITM6, AITM7, AITM9 and AITM10 which highlighted understanding of delivery, consistent and reliable reporting, development of programme plans, improved management, improved oversight, greater level of certainty and a structured environment are important benefits to be applied by project managers towards assisting the public sector. The FIDPM recognises that project management plays a critical role in the delivery of public services in South Africa (FIDPM, 2019). The IDMS (2019) further notes through the implementation of the listed principles, key benefits are achievable. This emphasised the significance of project management as the cornerstone for ensuring the IDMS benefits are implemented towards improving service delivery. Therefore, factor 2 can be described as *“The application of IDM benefits by PMs”*.

Factor 3 loaded 4 items. Item EWIC4 emphasised that employment of skilled persons is critical for effective ways of introducing change on public sector projects. The PMBOK (2021) reinforced that project management is extensively regarded as the most effective way of introducing unique change and may assist government introduce change on public sector projects.

Items ESDC5, ESDC6 and ESDC7 depicted mismanagement, a lack of public participation and an absence of people centred culture are important service delivery challenges that can be addressed through the ten PM areas of expertise. The PMBOK (2017) emphasised experienced project managers possess ten knowledge areas of expertise, processes, and tools and techniques which put a sound foundation in place enabling them to assist government address service delivery challenges. Government should consider engaging with experienced PM’s towards utilising their knowledge, tools and techniques to improve service delivery. Therefore, factor 3 can be described as *“Effective ways of introducing change and PM areas of expertise for service delivery challenges”*.

Factor 4 loaded 3 items which indicated that KSSEP3, strategic business was a key skill set of effective PMs, while items ESDC8 and ESDC10 confirmed that training and development and, strategic planning were important service delivery challenges that can be addressed through the ten PM areas of expertise. It is critical for government to consider utilising PM’s to employ their key skill sets towards ensuring the effective implementation of project management knowledge areas of expertise, processes, and tools and techniques as this will be the first step towards improving service delivery (Mashamaite, 2014; PMBOK, 2017). As a result, factor 4 can be described as *“Key skill sets of effective PMs and PM areas of expertise for service delivery challenges”*.

Factors 5 loaded 2 items, ESDC1 and ESDC2 which illustrated that policy issues and implementation issues are fundamental service delivery challenges that can be addressed through the ten PM areas of

expertise. In addition, Factor 6 also loaded 2 items, ESDC3 and ESDC4 depicting that prolonged procurement and acute problems are also key service delivery challenges that may be addressed through the ten PM areas of expertise.

Factor 7 loaded only 1 item, KIG8 depicting that to better utilise technology in the delivery of services was seen as an important key institutional goal. No items loaded under factor 8. Factor 9 loaded 2 items, namely, EWIC2 and EWIC3 suggesting that developing a plan to achieve these and then working this plan, ensuring that progress is maintained in line with these objectives including using appropriate project management techniques and tools to plan, monitor and maintain progress are effective ways of introducing change. Factor 10 loaded 1 item, KIG6 emphasising to remove the command/ control approach of management and accompanying excess regulation was viewed as a key institutional goal. Factor 11 loaded 1 item, AITP4 highlighting that evidence-based decision making is an important principle required to be applied by project managers towards assisting public sector implement the FIDPM.

Factors 5 to 12 did not have the need for statistical identification (Watkins, 2018) and were therefore dropped.

The correlation values depicted in Table 9.38 between the listed items and the PM tools and techniques driver where above the cut-off threshold and confirmed convergent validity. In addition, the correlation values ranged from .509 to .872 indicating discriminant validity, with the exception of items KSSEP3 and ESDC2 which displayed values over 0.9 but under 1, indicating a strong relationship to the driver. This construct satisfied the internal reliability criteria and the construct validity criteria.

Table 9.38: Pattern Matrix – PM Tools and Techniques (six unobserved variables)

Pattern Matrix ^a														
No.	Item Ref.	Item Description	1	2	3	4	5	6	7	8	9	10	11	12
PM Attributes														
1	PMA1	Ability to select and develop...	.694											
2	PMA2	Leadership and management...	.579											
3	PMA3	Ability to anticipate problems...	.567											
4	PMA4	Ability to integrate ...	.653											
5	PMA5	Operational flexibility...	.554											
6	PMA6	Ability to plan, expedite ...	.628											
7	PMA7	Ability to negotiate ...	.731											
8	PMA8	Understand the environment ...	.632											
9	PMA9	Ability to review, monitor...	.775											
10	PMA10	Ability to administer...	.694											
11	PMA11	The ability to keep...												
Effective Ways of Introducing Change														
1	EWIC1	Defining what has to be...												
2	EWIC2	Developing a plan to...									.661			.660
3	EWIC3	Using appropriate project...									.683			

4	EWIC4	Employing persons skilled...				.808													
Key Skill Sets of Effective PM's																			
1	KSSEP1	Technical Project...																	
2	KSSEP2	Leadership...																	
3	KSSEP3	Strategic and Business...				.975													
Ten PM Areas of Expertise and Service Delivery Challenges																			
1	ESDC1	Policy issues. ...					.752												
2	ESDC2	Implementation issues...					.934												
3	ESDC3	Prolonged procurement...							.787										
4	ESDC4	Acute problems...							.830										
5	ESDC5	Mismanagement...				.872													
6	ESDC6	A lack of public...				.851													
7	ESDC7	Absence of people...				.726													
8	ESDC8	Training and development...					.536												
9	ESDC9	Lack of effective...																	
10	ESDC10	Strategic planning...				.525													
11	ESDC11	Poor site management...																	
12	ESDC12	Time and cost...																	
13	ESDC13	Skills and competency...																	
Key Institutional Goals																			
1	KIG1	To be more responsive...																	
2	KIG2	To be more efficient...																	
3	KIG3	To be more representative...																	
4	KIG4	To improve access to services...																	
5	KIG5	To be more flexible...																	
6	KIG6	To remove the command...																.839	
7	KIG7	To have the ability to...																	
8	KIG8	To better utilise...								.670									
Application of IDM Toolkits Principles by PM's (Principles)																			
1	AITP1	Policy consistency...																	
2	AITP2	Planning alignment...																	
3	AITP3	Clarity of responsibility...																	
4	AITP4	Evidence-based decision making...																	.509
5	AITP5	Continuous improvement...																	
6	AITP6	Continuous capacity...																	
Application of IDM Toolkits Benefits by PM's (Benefits)																			
1	AITB1	Understanding of delivery...				.762													
2	AITB2	Improved control of...																	
3	AITB3	Consistent, reliable ...				.553													
4	AITB4	Development of...				.563													
5	AITB5	Alignment of the...																	
6	AITB6	Improved management...				.588													
7	AITB7	Improved oversight...				.512													
8	AITB8	Greater level of uniformity...																	
9	AITB9	Greater level of certainty...				.637													
10	AITB10	A structured environment...				.601													
11	AITB11	Senior management...																	
12	AITB12	The quality and value...																	

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalisation.^a

Project Management Tools and Techniques – Implementation of IDM Principles and Benefits

The implementation stage, which forms part of the project management tools and techniques driver comprised the last (seventh) unobserved variable, namely, implementation of IDM toolkits principles and benefits in FIDPM work stages (IDMTP and IDMTB).

Table 9.39 highlighted both the KMO, and Bartlett's test indicated the factors can be analysed. The KMO for the IDMTB/P was 0.766, which is at a middling level, and the Bartlett's test showed a significance of 0.00 ($p < 0.00$).

Table 9.39: KMO and Bartlett's Test – PM Tools and Techniques – Implementation of IDM Principles and Benefits

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.766
Bartlett's Test of Sphericity	Approx. Chi-Square	63228.130
	df	2415
	Sig.	.000

Table 9.40 depicted the items which were removed after a few runs, in order to achieve a clean extraction of communalities, using the Maximum Likelihood extraction method.

Table 9.40: Communalities – PM Tools and Techniques - Implementation of IDM Principles and Benefits

Communalities ^a				
No.	Item Ref.	Item Description	Initial	Extraction
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 1: Initiation (Principles)				
1	IDMTPA1	Policy consistency...	.988	.675
2	IDMTPB1	Planning alignment...	.973	.742
3	IDMTPC1	Clarity of responsibility...	.992	.879
4	IDMTPD1	Evidence-based decision...	.994	.902
5	IDMTPE1	Continuous improvement...	.985	.847
6	IDMTPF1	Continuous capacity...	.994	.903
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 2: Concept (Principles)				
1	IDMTPA2	Policy consistency...	.968	.742
2	IDMTPB2	Planning alignment...	.986	.626
3	IDMTPC2	Clarity of responsibility...	.962	.822
4	IDMTPD2	Evidence-based decision...	.987	.898
5	IDMTPE2	Continuous improvement...	.978	.889
6	IDMTPF2	Continuous capacity...	.990	.914
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 3: Design Dev (Principles)				
1	IDMTPA3	Policy consistency...	.972	.693
2	IDMTPB3	Planning alignment... (removed, not positive definitive)		
3	IDMTPC3	Clarity of responsibility...	.988	.885
4	IDMTPD3	Evidence-based decision...	.996	.981
5	IDMTPE3	Continuous improvement...	.990	.907
6	IDMTPF3	Continuous capacity...	.995	.895
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 4: Design Doc (Principles)				
1	IDMTPA4	Policy consistency...	.992	.895
2	IDMTPB4	Planning alignment...	.994	.911
3	IDMTPC4	Clarity of responsibility...	.989	.787
4	IDMTPD4	Evidence-based decision...	.995	.876
5	IDMTPE4	Continuous improvement...	.981	.835
6	IDMTPF4	Continuous capacity...	.993	.939
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 5: Works (Principles)				
1	IDMTPA5	Policy consistency...	.995	.860
2	IDMTPB5	Planning alignment...	.997	.965

3	IDMTPC5	Clarity of responsibility... (removed, not positive definitive)		
4	IDMTPD5	Evidence-based decision... (removed, not positive definitive)		
5	IDMTPE5	Continuous improvement...	.997	.960
6	IDMTPF5	Continuous capacity... (removed, not positive definitive)		
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 6: Handover (Principles)				
1	IDMTPA6	Policy consistency... (removed, not positive definitive)	.466	.230
2	IDMTPB6	Planning alignment... (removed, not positive definitive)		
3	IDMTPC6	Clarity of responsibility... (removed, not positive definitive)		
4	IDMTPD6	Evidence-based decision... (removed, not positive definitive)		
5	IDMTPE6	Continuous improvement... (removed, not positive definitive)		
6	IDMTPF6	Continuous capacity... (removed, not positive definitive)		
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 7: Close Out (Principles)				
1	IDMTPA7	Policy consistency...	.667	.459
2	IDMTPB7	Planning alignment...		
3	IDMTPC7	Clarity of responsibility...	.774	.610
4	IDMTPD7	Evidence-based decision...	.792	.699
5	IDMTPE7	Continuous improvement...		
6	IDMTPF7	Continuous capacity...	.697	.691
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 1: Initiation (Benefits)				
1	IDMTBA1	Understanding of delivery...	.988	.675
2	IDMTBB1	Improved control of...	.973	.742
3	IDMTBC1	Consistent, reliable ...	.992	.879
4	IDMTBD1	Development of...	.994	.902
5	IDMTBE1	Alignment of the...	.985	.847
6	IDMTBF1	Improved management...	.994	.903
7	IDMTBG1	Improved oversight...	.992	.893
8	IDMTBH1	Greater level of uniformity...	.996	.859
9	IDMTBI1	Greater level of certainty...	.995	.928
10	IDMTBJ1	A structured environment...	.990	.902
11	IDMTBK1	Senior management...	.995	.915
12	IDMTBL1	The quality and value...	.997	.909
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 2: Concept (Benefits)				
1	IDMTBA2	Understanding of delivery...	.968	.742
2	IDMTBB2	Improved control of...	.986	.626
3	IDMTBC2	Consistent, reliable ...	.962	.822
4	IDMTBD2	Development of...	.987	.898
5	IDMTBE2	Alignment of the...	.978	.889
6	IDMTBF2	Improved management...	.990	.914
7	IDMTBG2	Improved oversight...	.994	.908
8	IDMTBH2	Greater level of uniformity...	.996	.908
9	IDMTBI2	Greater level of certainty...	.996	.956
10	IDMTBJ2	A structured environment...	.993	.873
11	IDMTBK2	Senior management...	.992	.904
12	IDMTBL2	The quality and value... (removed, not positive definitive)		
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 3: Design Dev (Benefits)				
1	IDMTBA3	Understanding of delivery...	.972	.693
2	IDMTBB3	Improved control of... (removed, not positive definitive)		
3	IDMTBC3	Consistent, reliable ...	.988	.885
4	IDMTBD3	Development of...	.996	.981
5	IDMTBE3	Alignment of the...	.990	.907
6	IDMTBF3	Improved management...	.995	.895
7	IDMTBG3	Improved oversight...	.987	.803
8	IDMTBH3	Greater level of uniformity...	.979	.895
9	IDMTBI3	Greater level of certainty...	.997	.826
10	IDMTBJ3	A structured environment...	.998	.862
11	IDMTBK3	Senior management...	.996	.833
12	IDMTBL3	The quality and value...	.996	.784
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 4: Design Doc (Benefits)				

1	IDMTBA4	Understanding of delivery...	.992	.895
2	IDMTBB4	Improved control of...	.994	.911
3	IDMTBC4	Consistent, reliable ...	.989	.787
4	IDMTBD4	Development of...	.995	.876
5	IDMTBE4	Alignment of the...	.981	.835
6	IDMTBF4	Improved management...	.993	.939
7	IDMTBG4	Improved oversight...	.978	.863
8	IDMTBH4	Greater level of uniformity...	.996	.870
9	IDMTBI4	Greater level of certainty...	.997	.914
10	IDMTBJ4	A structured environment...	.996	.890
11	IDMTBK4	Senior management...	.997	.896
12	IDMTBL4	The quality and value...	.980	.785
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 5: Works (Benefits)				
1	IDMTBA5	Understanding of delivery...	.995	.860
2	IDMTBB5	Improved control of...	.997	.965
3	IDMTBC5	Consistent, reliable... (removed, not positive definitive)		
4	IDMTBD5	Development of... (removed, not positive definitive)		
5	IDMTBE5	Alignment of the...	.997	.960
6	IDMTBF5	Improved management...		
7	IDMTBG5	Improved oversight...	.996	.905
8	IDMTBH5	Greater level of uniformity...		
9	IDMTBI5	Greater level of certainty...	.996	.949
10	IDMTBJ5	A structured environment...	.995	.941
11	IDMTBK5	Senior management...	.997	.897
12	IDMTBL5	The quality and value...	.996	.972
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 6: Handover (Benefits)				
1	IDMTBA6	Understanding of delivery...	.466	.230
2	IDMTBB6	Improved control of... (removed, not positive definitive)		
3	IDMTBC6	Consistent, reliable ... (removed, not positive definitive)		
4	IDMTBD6	Development of... (removed, not positive definitive)		
5	IDMTBE6	Alignment of the... (removed, not positive definitive)		
6	IDMTBF6	Improved management... (removed, not positive definitive)		
7	IDMTBG6	Improved oversight...	.684	.244
8	IDMTBH6	Greater level of uniformity...	.639	.115
9	IDMTBI6	Greater level of certainty...	.814	.294
10	IDMTBJ6	A structured environment...	.700	.168
11	IDMTBK6	Senior management...	.746	.298
12	IDMTBL6	The quality and value...		
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 7: Close Out (Benefits)				
1	IDMTBA7	Understanding of delivery...	.667	.459
2	IDMTBB7	Improved control of... (removed, not positive definitive)		
3	IDMTBC7	Consistent, reliable ...	.774	.610
4	IDMTBD7	Development of...	.792	.699
5	IDMTBE7	Alignment of the... (removed, not positive definitive)		
6	IDMTBF7	Improved management...	.697	.691
7	IDMTBG7	Improved oversight...	.730	.539
8	IDMTBH7	Greater level of uniformity...	.743	.535
9	IDMTBI7	Greater level of certainty...	.771	.568
10	IDMTBJ7	A structured environment...	.826	.795
11	IDMTBK7	Senior management...	.854	.832
12	IDMTBL7	The quality and value...	.763	.650

Extraction Method: Maximum Likelihood.

The Total Variance Explained for the PM tools and techniques – implementation of IDM principles and benefits presented in Table 9.41 indicated nine factors emerged with factors greater than 1 which

explained an 83.52% of the variance and could therefore be considered valid. Figure 9.7 depicted the scree plot.

Table 9.41: Total Variance Explained – PM Tools and Techniques - Implementation of IDM Principles and Benefits

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	27.942	39.917	39.917	27.486	39.266	39.266	25.481
2	9.270	13.243	53.159	9.020	12.886	52.152	15.647
3	5.994	8.563	61.722	4.642	6.631	58.783	8.699
4	4.823	6.890	68.613	2.463	3.518	62.301	4.654
5	3.010	4.301	72.913	2.561	3.658	65.959	4.116
6	2.317	3.310	76.223	4.616	6.594	72.553	8.263
7	2.230	3.186	79.409	1.368	1.954	74.507	9.231
8	1.675	2.393	81.802	1.113	1.591	76.098	2.096
9	1.200	1.714	83.516	1.525	2.179	78.277	6.217

Extraction Method: Maximum Likelihood.

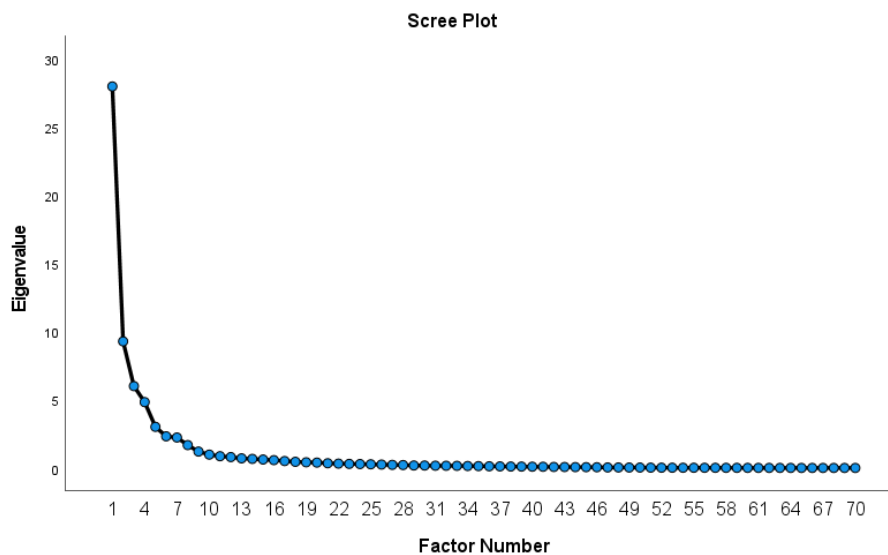


Figure 9.7: Scree Plot – PM Tools and Techniques - Implementation of IDM Principles and Benefits

Table 9.42 illustrated the pattern matrix for the seventh unobserved variable for PM tools and techniques driver. The factor analysis entailed maximum likelihood (ML) extraction which was used with Kaiser Normalisation including Promax rotation. Coefficients were suppressed with an absolute value below 0.5 and the factors returned were based on the number of interpretable factors. Eigenvalues greater than one yielded 9 factors which depicted the items which loaded under each of the seven FIDPM work stages.

The factor loadings for “*implementation of IDM principles...*” for all seven work stages were too high to be included in the pattern matrix and had to be interpreted with caution.

Factor 1 loaded 8 items under work stage 3 (benefits), namely, IDMTBD3, IDMTBF3, IDMTBG3, IDMTBH3, IDMTBI3, IDMTBJ3, IDMTBK3 and IDMTBL3 indicating that the development of programme plans, improved management, improved oversight, greater level of uniformity, greater level of certainty, a structured environment, senior management including quality and value were highlighted as important benefits to be implemented by government for work stage 3. The IDMS (2019) and FIDPM (2019) highlight in work stage 3 that regular and in-depth engagement exists with public sector employees and it is therefore important towards ensuring these benefits are realised. In addition, all 12 items loaded under work stage 4 (benefits) suggesting that all benefits listed were fundamental for implementation by government under work stage 4. During the important and pivotal work stage 4, government needs to ensure all benefits are experienced throughout the project stages (IDMS, 2019). Furthermore, 8 items loaded under work stage 5 (benefits), IDMTBA5, IDMTBB5, IDMTBE5, IDMTBG5, IDMTBI5, IDMTBJ5, IDMTBK5 and IDMTBL5 emphasising that understanding of delivery, improved control, alignment of allocated budgets, improved oversight, greater level of certainty, a structured environment, senior management including quality and value were highlighted as key benefits to be implemented by government for work stage 5. IDM benefits are critically important to work stage 5 (IDMS, 2019). However, work stage 5 highlighted that public sector employees lacked the ability to implement these benefits as they were always absent. It is imperative for government to address these concerns if they are to realise the benefits that can assist in the improvement of service delivery. Therefore, factor 1 can be described as “*Implementation of IDM benefits for work stages 3, 4 and 5*”.

Factor 2 loaded 11 items under work stage 2 (benefits), namely, IDMTBA2, IDMTBB2, IDMTBC2, IDMTBD2, IDMTBE2, IDMTBF2, IDMTBG2, IDMTBH2, IDMTBI2, IDMTBJ2 and IDMTBK2 illustrating that an understanding of delivery, improved control, consistent and reliable reporting, development of programme plans, alignment of allocated budgets, improved management, improved oversight, greater level of uniformity, greater level of certainty, a structured environment and senior management were important benefits required to be implemented by government under work stage 2. The IDMS (2019) illustrates that the involvement of public employees increases in stage 2. However, the importance of the listed benefits was still non-existent and requires urgent intervention by government to address these inefficiencies. Therefore, factor 2 can be described as “*Implementation of IDM benefits for work stage 2*”.

Factor 3 loaded 9 items under work stage 1 (benefits), IDMTBA1, IDMTBB1, IDMTBC1, IDMTBD1, IDMTBE1, IDMTBF1, IDMTBG1, IDMTBH1 and IDMTBI1 depicting that an understanding of delivery, improved control, consistent and reliable reporting, development of programme plans, alignment of allocated budgets, improved management, improved oversight, greater level of uniformity and greater level of certainty were highlighted as key benefits to be implemented by government for work stage 1. The FIDPM (2019) and IDMS (2019) highlight that during the first stage, the level of involvement from public employees is minimal as the project initiation and prefeasibility report is prepared by the professional consultant team guided by the PM. However, through limited involvement from the public sector, key benefits were not experienced which raised serious concern for governments ability not to be able to implement the benefits in the first work stage of this important service delivery framework. As a result, factor 3 can be described as *“Implementation of IDM benefits for work stage 1”*.

Factor 4 loaded 6 items under work stage 7 (benefits), namely, IDMTBC7, IDMTBD7, IDMTBF7, IDMTBG7, IDMTBH7 and IDMTBI7 highlighting that consistent and reliable reporting, development of programme plans, improved management, improved oversight, greater level of uniformity and a greater level of certainty were important benefits required to be implemented by government under work stage 7. Factor 5 also loaded 3 items under work stage 7 (benefits), IDMTBJ7, IDMTBK7 and IDMTBL7 indicating that a structured environment, senior management including quality and value were fundamental benefits required to be implemented by government under work stage 7.

The final stage involves closing out the project which requires the PM to ensure the professional consultant team meets the requirements from a defined list of deliverables prescribed by the FIDPM (FIDPM, 2019). However, the results during stage 7 indicated that limited and questionable skills and knowledge base were displayed by public sector employees. This is of grave concern as government needs to be able to realise the benefits of improved service delivery throughout all seven work stages. As a result, factors 4 and 5 can be described as *“Implementation of IDM benefits for work stage 7”*.

Factor 6 loaded 3 items under work stage 1 (benefits), namely, IDMTBJ1, IDMTBK1 and IDMTBL1 indicating that a structured environment, senior management including quality and value were important benefits required to be implemented by government under work stage 1. Work stage one has highlighted minimal public sector involvement (FIDPM, 2019). However, factor 6 has emphasised that the remaining benefits under this work stage still need to be implemented by government if service delivery is to be improved during this work stage. As a result, factor 6 can be described as *“Implementation of IDM benefits for work stage 1”*.

Factor 7 loaded 3 items under work stage 3 (benefits), IDMTBC3, IDMTBD3 and IDMTBE3 which depicted that consistent and reliable reporting, development of programme plans, and alignment of

allocated budgets were key benefits to be implemented by government during FIDPM work stage 3. In addition, item IDMTBD3 also loaded under factor 1, however, was retained under factor 7 as it displayed a stronger relationship to work stage 3 (benefits). The FIDPM (2019) depicted that regular and in-depth engagement occurs between the PM and the public sector. However, there are limited experiences regarding the implementation of the listed benefits. Government needs to address these concerns as they are critical towards preventing improved service delivery. Therefore, factor 7 can be described as *“Implementation of IDM benefits for work stage 3”*.

Factor 8 loaded 3 items under work stage 6 (benefits), namely, IDMTBA6, IDMTBB6 and IDMTBC6 emphasising a strong relationship between the understanding of delivery, improved control and, consistent and reliable reporting under work stage 6 suggesting that these are critical benefits needed to be implemented by government. Stage 6 is an extension of stage 5, which entails handing over the completed works to the client and end users (FIDPM, 2019). The results in stage 6 suggested limited benefits were implemented, and some were not further suggesting questionable commitment from government towards consistently applying the benefits. As a result, factor 8 can be described as *“Implementation of IDM benefits for work stage 6”*.

Factor 9 loaded 3 items under work stage 5 (benefits), namely, IDMTBI5, IDMTBJ5 and IDMTBL5. However, the loadings under factor 1 were retained as they indicated stronger relationship with work stage 5 (benefits).

Table 9.42 further displayed the correlations values for the seventh unobserved variable for PM tools and techniques. The correlation values for the *“implementation of IDM benefits...”* ranged from .509 to .976 indicating discriminant validity, with the exception of the items which displayed values over 0.9 but under 1, indicating a strong relationship to the driver. This construct met the requirements for the internal reliability criteria, however, the low correlations were acknowledged and observed with caution.

Table 9.42: Pattern Matrix – PM Tools and Techniques - Implementation of IDM Principles and Benefits

Pattern Matrix ^a											
No.	Item Ref.	Item Description	1	2	3	4	5	6	7	8	9
Implementation of IDM Toolkits Benefits in FIDPM Work Stages – Stage 1: Initiation (Benefits)											
1	IDMTBA1	Understanding of delivery...			.555						
2	IDMTBB1	Improved control of...			.869						
3	IDMTBC1	Consistent, reliable ...			.790						
4	IDMTBD1	Development of...			.716						
5	IDMTBE1	Alignment of the...			.622						
6	IDMTBF1	Improved management...			.846						
7	IDMTBG1	Improved oversight...			.933						
8	IDMTBH1	Greater level of uniformity...			.798						
9	IDMTBI1	Greater level of certainty...			.938						
10	IDMTBJ1	A structured environment...						.777			
11	IDMTBK1	Senior management...						.774			
12	IDMTBL1	The quality and value...						.804			
Implementation of IDM Toolkits Benefits in FIDPM Work Stages – Stage 2: Concept (Benefits)											
1	IDMTBA2	Understanding of delivery...		.768							
2	IDMTBB2	Improved control of...		.798							
3	IDMTBC2	Consistent, reliable ...		.913							
4	IDMTBD2	Development of...		.826							
5	IDMTBE2	Alignment of the...		.842							
6	IDMTBF2	Improved management...		.902							
7	IDMTBG2	Improved oversight...		.947							
8	IDMTBH2	Greater level of uniformity...		.896							
9	IDMTBI2	Greater level of certainty...		.897							
10	IDMTBJ2	A structured environment...		.931							
11	IDMTBK2	Senior management...		.953							
12	IDMTBL2	The quality and value...									
Implementation of IDM Toolkits Benefits in FIDPM Work Stages – Stage 3: Design Dev (Benefits)											
1	IDMTBA3	Understanding of delivery...									
2	IDMTBB3	Improved control of...									
3	IDMTBC3	Consistent, reliable ...						.649			
4	IDMTBD3	Development of...	.516					.670			
5	IDMTBE3	Alignment of the...						.638			
6	IDMTBF3	Improved management...	.766								
7	IDMTBG3	Improved oversight...	.783								
8	IDMTBH3	Greater level of uniformity...	.943								
9	IDMTBI3	Greater level of certainty...	.880								
10	IDMTBJ3	A structured environment...	.915								
11	IDMTBK3	Senior management...	.878								
12	IDMTBL3	The quality and value...	.830								
Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 4: Design Doc (Benefits)											
1	IDMTBA4	Understanding of delivery...	.908								
2	IDMTBB4	Improved control of...	.889								
3	IDMTBC4	Consistent, reliable ...	.859								
4	IDMTBD4	Development of...	.900								
5	IDMTBE4	Alignment of the...	.894								
6	IDMTBF4	Improved management...	.976								
7	IDMTBG4	Improved oversight...	.912								
8	IDMTBH4	Greater level of uniformity...	.927								
9	IDMTBI4	Greater level of certainty...	.931								
10	IDMTBJ4	A structured environment...	.896								
11	IDMTBK4	Senior management...	.769								
12	IDMTBL4	The quality and value...	.887								
Implementation of IDM Toolkits Benefits in FIDPM Work Stages – Stage 5: Works (Benefits)											

1	IDMTBA5	Understanding of delivery...	.794								
2	IDMTBB5	Improved control of...	.734								
3	IDMTBC5	Consistent, reliable...									
4	IDMTBD5	Development of...									
5	IDMTBE5	Alignment of the...	.842								
6	IDMTBF5	Improved management...									
7	IDMTBG5	Improved oversight...	.738								
8	IDMTBH5	Greater level of uniformity...									
9	IDMTBI5	Greater level of certainty...	.712								.509
10	IDMTBJ5	A structured environment...	.647								.564
11	IDMTBK5	Senior management...	.756								
12	IDMTBL5	The quality and value...	.653								.513
Implementation of IDM Toolkits Benefits in FIDPM Work Stages – Stage 6: Handover (Benefits)											
1	IDMTBA6	Understanding of delivery...									.713
2	IDMTBB6	Improved control of...									.657
3	IDMTBC6	Consistent, reliable ...									.746
4	IDMTBD6	Development of...									
5	IDMTBE6	Alignment of the...									
6	IDMTBF6	Improved management...									
7	IDMTBG6	Improved oversight...									
8	IDMTBH6	Greater level of uniformity...									
9	IDMTBI6	Greater level of certainty...									
10	IDMTBJ6	A structured environment...									
11	IDMTBK6	Senior management...									
12	IDMTBL6	The quality and value...									
Implementation of IDM Toolkits Benefits in FIDPM Work Stages – Stage 7: Close Out (Benefits)											
1	IDMTBA7	Understanding of delivery...									
2	IDMTBB7	Improved control of...									
3	IDMTBC7	Consistent, reliable ...				.841					
4	IDMTBD7	Development of...				.866					
5	IDMTBE7	Alignment of the...									
6	IDMTBF7	Improved management...				.907					
7	IDMTBG7	Improved oversight...				.654					
8	IDMTBH7	Greater level of uniformity...				.628					
9	IDMTBI7	Greater level of certainty...				.539					
10	IDMTBJ7	A structured environment...					.912				
11	IDMTBK7	Senior management...					.908				
12	IDMTBL7	The quality and value...					.647				

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalisation.^a

9.3.5 Pattern Matrix

Table 9.43 depicted that all items were retained under the factor 1 suggesting a strong relationship between the FIDPM seven work stages for principles and benefits and PM tools and techniques. Therefore factor 1 may be described as “*PM Tools and Techniques – IDM Implementation of principles and benefits*”. All 6 items loaded under factor 2 indicating that they were critical to PM tools and techniques. Therefore, factor 2 may be described as “*PM tools and techniques*”. In addition, factor 3 illustrated a strong relationship between all 7 items and the public sector. Therefore, factor 3 can be described as the “*The public sector*”. Lastly, factor 4 loaded all 5 items indicating they are important to government policies, frameworks and the FIDPM. As a result, factor 4 can be described as “*government policies, frameworks and the FIDPM*”.

In addition, Table 9.43 indicated that all 19 unobserved variables are highly correlated with the three drivers for improved service delivery and met the requirements for convergent reliability. Discriminant validity was met for all items below <0.9, while the remaining items greater than 0.9 but under 1 indicated strong relationships between the item and the unobserved variable. Items were removed for not being positive definitive and due to very high communalities to neutralise the results in order to achieve a clean extraction of communalities. The pattern matrix correlation values satisfied the internal reliability criteria and construct validity criteria.

Table 9.43: Pattern Matrix for Retained Factors

Pattern Matrix ^a						
No.	Item Ref.	Item Description	1	2	3	4
PM Tools and Techniques – IDM Implementation of principles and benefits						
2	IMPP2	Work stage 2 – Principles	.982			
2	IMPB2	Work stage 2 – Benefits	.961			
1	IMPP1	Work stage 1 – Principles	.955			
5	IMPP5	Work stage 5 – Principles	.948			
5	IMPB5	Work stage 7 – Benefits	.929			
7	IMPP7	Work stage 7 – Principles	.929			
3	IMPB3	Work stage 3 – Benefits	.928			
4	IMPB4	Work stage 4 – Benefits	.905			
1	IMPB1	Work stage 1 – Benefits	.896			
6	IMPB6	Work stage 6 – Benefits	.872			
7	IMPB7	Work stage 7 – Benefits	.852			
4	IMPP4	Work stage 4 – Principles	.814			
3	IMPP3	Work stage 3 – Principles	.794			
6	IMPP6	Work stage 6 – Principles	.748			
PM Tools and Techniques						
6	AITB	Application of IDM Toolkits Benefits by PM's		.964		
4	ESDC	Ten PM Areas of Expertise and Service Delivery Challenges		.952		
5	KIG	Key Institutional Goals		.896		
6	AITP	Application of IDM Toolkits Principles by PM's		.887		
3	KSSEP	Key Skill Sets of Effective PM's		.870		
1	PMA	PM Attributes		.827		
2	EWIC	Effective Ways of Introducing Change		.816		
The Public Sector						
6	GPDM	Government Processes and Decision Making			.988	
5	SDC	Service Delivery Challenges			.848	
7	MSSD	Management Strategies for Service Delivery			.809	
1	RPPS	Recurring Problems in the Public Sector			.774	
2	PSTS	Public Service Transformation Strategies			.767	
3	GI	Government Initiatives			.661	
4	BPP	Batho Pele Principles			.579	
Government Policies, Frameworks and the FIDPM						
3	SCMPPC	SCM Public Procurement Challenges				.846
5	GAAFP	Government Ability to Apply the FIDPM (Principles)				.754
4	ISF	IDMS, SIPDM & FIDPM				.736
5	GAAFB	Government Ability to Apply the FIDPM (Benefits)				.704
1	PDI	Policy Development and Implementation				.654
2	EPI	Effective Policy Implementation				.642

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalisation.^a

9.3.6 Reliability and Validity

The reliability and validity for the loaded items was assessed and implemented to establish whether the factors were high enough and met the acceptable threshold (Kline, 2016).

Average Variance Extracted (AVE) is used to assess convergent validity and refers to the degree to which a measure is correlated with other measures that are theoretically predicted to correlate with (Pallant, 2020). The researcher examined the AVE to identify, on average, how much variations on the listed items may be explained by the construct (latent variable) (Kline, 2016).

Convergent validity refers to the degree to which two variables intended to measure a construct, theoretically should be related, are in fact related (Hair *et al.* 2018). In addition, convergent validity exists when the item loads on their constructs without cross-loading. Adequate convergent value for AVE of 0.5 is accepted, while values above 0.7 are considered very good (Chinomova and Omoruyi, 2015).

Composite Reliability (CR) measures internal consistency of a scale where the within-scale of responses of the construct are evaluated. It further entails a less bias estimate of reliability than Cronbach's Alpha where the acceptable value is 0.6 and above (Hair *et al.* 2018).

Table 9.44 indicated that some of the factors loaded below 0.5. However, they were included (with caution) for the confirmatory factor analysis process. Average Variance Extracted (AVE) and Composite Reliability (CR) were calculated using Microsoft Excel formula, (λ , λ^2 , $1-\lambda^2$) and all constructs were above the marginally accepted 0.4. As a result, it can be concluded that all validity measures were met (Chin, 2010; Chinomona and Omoruyi, 2015).

According to Hulin, Netemeyer, and Cudeck (2001), a general accepted rule for alpha measures is:

- α of 0.6 - 0.7 indicates an acceptable level of reliability,
- 0.8 or greater a very good level.
- values higher than 0.95 are not necessarily good, since they might be an indication of redundancy.

Table 9.44 illustrated that none of the values were lower than 0.6 or higher than 0.95. All alpha values for the drivers ranged between .752 and .865 which were considered to be an acceptable to a very good level of reliability.

The EFA highlighted that the drivers for improved service delivery are valid and reliable. Government through the public sector still struggles with the implementation of the current policy. The FIDPM

recognises that project management plays a critical role in the delivery of public services in South Africa. Government should consider utilising experienced project managers to enhance the implementation of the FIDPM as they are in a key position to assist government improve policy implementation towards improving service delivery.

Table 9.44: Results of CR, AVE and Alpha Analysis

N=410			Mean	Std. Deviation	Communalities	Factor Loading	CR	AVE	Alpha
Public Sector									
1	RPPS	Recurring problems in the public sector	1.20	.399	.910	.951	.594	.599	.846
2	PSTS	Public service transformation strategies	1.22	.428	.939	.917			
3	GI	Government initiatives	1.44	.738	.934	.837			
4	BPP	Batho Pele principles	1.58	.828	.965	.814			
5	SDC	Service delivery challenge	4.70	.515	.481	-.707			
6	GPDM	Government processes and decision making	4.77	.494	.372	-.571			
7	MSSD	Management strategies for service delivery	4.70	.562	.318	-.506			
Government Framework									
1	PDI	Policy development and implementation	1.68	.476	.999	.956	.855	.661	.752
2	EPI	Effective policy implementation	1.68	.477	.938	.925			
3	SCMPPC	SCM public procurement challenge	1.73	.453	.880	.867			
4	ISF	IDMS, SIPDM & FIDPM	1.50	.515	.856	.757			
5	GAAFP	Government ability to apply FIDPM Principles	4.40	.510	.607	-.683			
5	GAAFB	Government ability to apply FIDPM Benefits	1.92	.676	.911	.639			
Project Management Tools and Techniques									
1	PMA	PM attributes	4.72	.505	.454	-.492	.806	.599	.865
2	EWIC	Effective ways of introducing change	1.87	.377	.920	.931			
3	KSSEP	Key skill sets of effective PMs	1.87	.377	.885	.911			
4	ESDC	Ten PM areas of expertise...	1.89	.402	.834	.890			
5	KIG	Key institutional goals	1.90	.422	.925	.824			
6	AITP	Application of IDM toolkits principles...	1.79	.442	.839	.775			
6	AITB	Application of IDM toolkits benefits...	4.88	.415	.179	-.429			
Project Management Tools and Techniques - Implementation									
1	IDTMP1	Work stage 1 – principles	1.09	.287	.994	-.907	.594	.457	.847
2	IDMTP2	Work stage 2 – principles	1.10	.321	.941	-.882			
3	IDMTP3	Work stage 3 – principles	4.86	.438	.272	.608			
4	IDMTP4	Work stage 4 – principles	4.79	.540	.323	.552			
5	IDMTP5	Work stage 5 – principles	4.83	.469	.181	.516			
6	IDMTP6	Work stage 6 – principles	4.81	.479	.152	.478			
7	IDMTP7	Work stage 7 – principles	4.80	.495	.275	.455			
1	IDTMB1	Work stage 1 – benefits	4.77	.560	.253	.447			
2	IDMTB2	Work stage 2 – benefits	4.73	.528	.383	.446			
3	IDMTB3	Work stage 3 – benefits	1.04	.228	.892	1.030			
4	IDMTB4	Work stage 4 – benefits	1.04	.228	.848	.912			
5	IDMTB5	Work stage 5 – benefits	1.06	.277	.676	.738			
6	IDMTB6	Work stage 6 – benefits	4.79	.581	.309	-.590			
7	IDMTB7	Work stage 7 – benefits	4.93	.296	.444	-.466			

9.4 Confirmatory Factor Analysis Results (CFA)

Once the EFA was implemented, the researcher also conducted the CFA in order to validate a scale with a given or hypothesized factor. Structural Equation Modelling (SEM) was done using SPSS Amos version 26 and the pattern matrix from the EFA was used to create and analyse the model in Amos.

Statistics Solutions (2021) defines SEM as “*a multivariate statistical analysis technique that is used to analyse structural relationships.*” It does this by combining factor analysis and multiple regression analysis and is used to analyse the structural relationship between measured variables and latent constructs. Authors such as Hair *et al.* (2018), Pallant (2020) and Tabachnick and Fidell (2019) indicate SEM is the preferred method by the researchers because it estimates the multiple and interrelated dependence in a single analysis.

9.4.1 Initial Model and Adjustments

The model was created by using factor extraction by Maximum Likelihood with Promax Rotation after the EFA was run using SPSS version 27. This study considered numerous fit indices namely, Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Standardised Root Mean Square Residual ((S)RMR) and the Model Chi-Square (these statistical indicators are discussed under the model fit).

The initial model fit run created from the pattern matrix had poor values for RMSEA, CFI, SRMR and the Model Chi-Square was not estimated. As a result, there was a need for adjustments and a re-run after the removal of some factors. The first and second runs for reliability and validity indicated certain validity concerns which resulted in the removal of the following points:

The Public Sector, Service Delivery Challenges (SDC):

- SDC10 “*Training and development ...*” and SDC12 “*Strategic planning activities...*”

Government Policies, Frameworks and the FIDPM, Government Processes and Decision Making (GPDM):

- GPDM2 “*Service deliverers are currently forced...*”

PM Tools and Techniques, Implementation of IDM Principles (IMPP)

- IMPP4 “*Implementation of IDM Toolkits Principles in FIDPM Work Stages – Stage 4...*”

Both the reliability and validity analysis including model fit analysis were measured again in Amos using Gaskin’s Master Validity plugin tool (Gaskin, James and Lim, 2019), and Gaskin’s Model Fit Measures plugin tool (Gaskin and Lim, 2016), respectively.

Table 9.45 illustrates whilst there were still concerns with the government policies, frameworks and the FIDPM Average of 0.565, which is lower than 0.7 However, Malhotra and Dash (2011), argued that

AVE is often too strict, and reliability can be established through CR alone. The low AVE for government policies, frameworks and the FIDPM was therefore ignored.

Table 9.45: Reliability and Validity Analysis using AMOS

	CR	AVE	MSV	MaxR(H)	The Public Sector	Government Policies, Frameworks and the FIDPM	PM Tools and Techniques	PM Tools and Techniques - Implementation
The Public Sector	0.929	0.689	0.300	0.973	0.830			
Government Policies, Frameworks and the FIDPM	0.856	0.565	0.732	0.935	0.397***	0.751		
PM Tools and Techniques	0.977	0.861	0.732	0.981	0.548***	0.855***	0.928	
PM Tools and Techniques - Implementation	0.967	0.731	0.239	0.982	0.262***	0.459***	0.489***	0.855

9.4.2 Model Fit

The model fit after modifications and re-run, resulted in a better modified model fit. Table 9.46 depicts the cut-off criteria for model fit and Table 9.60 presents the results from the modified model.

Cut-off Criteria for Model Fit

The cut-off ranges for model fit are discussed by authors like Hu and Bentler (1999), Kline (2016), Hair *et al.* (2018) and Tabachnick and Fidell (2019). Table 9.46 further presents the cut-off ranges for model fit which are the most commonly used fit indices reported for CFA and SEM:

Table 9.46: Cut-off Ranges for Model Fit (Adapted from Hu and Bentler, 1999:3)

Measure	Name	Description	Cut-off for good fit
χ^2	Model Chi-Square	Assess overall fit and the discrepancy between the sample and fitted covariance matrices. H0: the model fits perfectly.	p-value>0.05
(A)GFI	(Adjusted) Goodness of Fit	GFI is the proportion of variance accounted for by the estimated population covariance. Analogous to R2. AGFI favours parsimony.	GFI \geq 0.95 AGFI \geq 0.90
(N)NFI TLI	(Non) Normed-Fit index Tucker Lewis index	An NFI of 0.95 Indicates the model of interest improves the fit by 95% relative to the null model. NNFI is preferable for smaller samples. Sometimes the NNFI is called the Tucker Lewis index (TLI)	NFI \geq 0.95 NNFI \geq 0.95
CFI	Comparative Fit index	A revised form of NFI. Not very sensitive to sample size. Compares the fit of a target model to the fit of an independent, or null model	CFI \geq 0.90
RMSEA	Root Mean Square Error of Approximation	A parsimony-adjusted index. Values closer to 0 represent a good fit.	RMSEA < 0.08

(S)RMR	Standardised Root Mean-Square Residual	The square-root of the difference between the residuals of the sample covariance matrix and the hypothesised model. If the items vary in range (i.e. some items are 1-5, others 1-7) then RMR is hard to interpret, better to use SRMR	SRMR > 0.5
AVE (CFA) only	Average Value Explained	The average of the R2s for items within a factor	AVE > 0.5

Kline (2016) indicated that the model fit indices require the reporting of at least a minimum of four indices, namely, Model Chi-Square, RMSEA, CFI and SRMR.

Model Chi-Square

This statistic is associated with maximum likelihood extraction and has the same general form under different methods. Chi-square also known as Pearson's chi-square test is implemented to test the relations between categorical variables and is commonly used to evaluate Tests of Independence when utilising crosstabulation. Model chi-square measures departure from perfect fit, while root mean square error of approximation measures from approximate fit. The threshold recommended to indicate a good fit is $p < 0.05$ (Tabachnick and Fidell, 2019).

Root Mean Square Error of Approximation (RMSEA)

RMSEA is an absolute fit index which is scaled as a badness-of-fit statistic. Values for RMSEA range from 0 to 1, with lower values indicating a better model fit. A value of < 0.06 indicates an acceptable model fit while zero indicates the best result. RMSEA usually enables models more degree of freedom and models analysed in larger samples with lower values of root mean square error of approximation (Hair *et al.* 2018).

Comparative Fit Index (CFI)

This is an imperative fit index that is also a goodness-of-fit statistic, and its values range from 0 to 1.0 were values closer to one indicate an acceptable model fit while 1.0 is highly recommended. In addition, it compares the amount of departure from the close fit of the researcher's model against the independence (null) model. A related statistic is the Tucker-Lewis index (TLI), however only one should be reported on due to their highly correlated values (Kline, 2016). Therefore, CFI was adopted for this study.

Standardised Root Mean Square Residual ((S)RMR)

This is an absolute fit index which is a badness-of-fit statistic. Values of SMSR > 0.10 indicate a poor fit. However, it is recommended that the matrix of correlation residuals should nonetheless still be inspected. SRMR involves computation as the square root of the average squared covariance residual

in a standardised metric. It is therefore a measure of the mean absolute correlation residual which entails the overall difference between the observed and predicted correlations (Hair *et al.* 2018: Kline, 2016).

As a result, this study adopted the recommendation as per Kline (2016) and reported on Model Chi-Square, RMSEA, CFI and SRMR. The estimates for the modified model, based on Kline’s suggestion are illustrated in Table 9.47. The Chi-Square indicated a p value of 0.000 which was considered significant. The RMSEA value was 0.198 which was not good as it was above the threshold of <0.06 and the researcher proceeded with caution regarding interpretation. In addition, the CFI statistic illustrated a value of 0.913 which was close to 1 and met the required threshold. Finally, the SRMR value was 0.087 and considered acceptable as it fell within the threshold limitation as it was less than 0.10, as values greater than 0.10 indicate a poor fit.

Table 9.47: Results from the Modified Model

Measure	Estimate	Interpretation	Threshold
Chi-Square (p-value)	0.000	Significant	Met the p value below 0.05
RMSEA	0.198	Not good	Met the threshold of <0.08
CFI	0.913	Acceptable	Met the threshold of >0.09
SRMR	0.087	Acceptable	Met the threshold of >0.10

Figure 9.8 presents the proposed final model after model fit. The proposed model is intended for government to adopt and implement through the public sector. The model should be introduced at the training and development stage to enhance public sector employees’ knowledge and awareness of service delivery challenges in the public sector, educate and bring to light the numerous failed policies implemented historically and the importance of the FIDPM for addressing service delivery. Finally, the model intends to drive government to utilise and employ experienced and skilled project managers as public sector employees. This will put public sector in a favourable position to implement project management tools and techniques to drive the successful implementation of the FIDPM and improve service delivery.

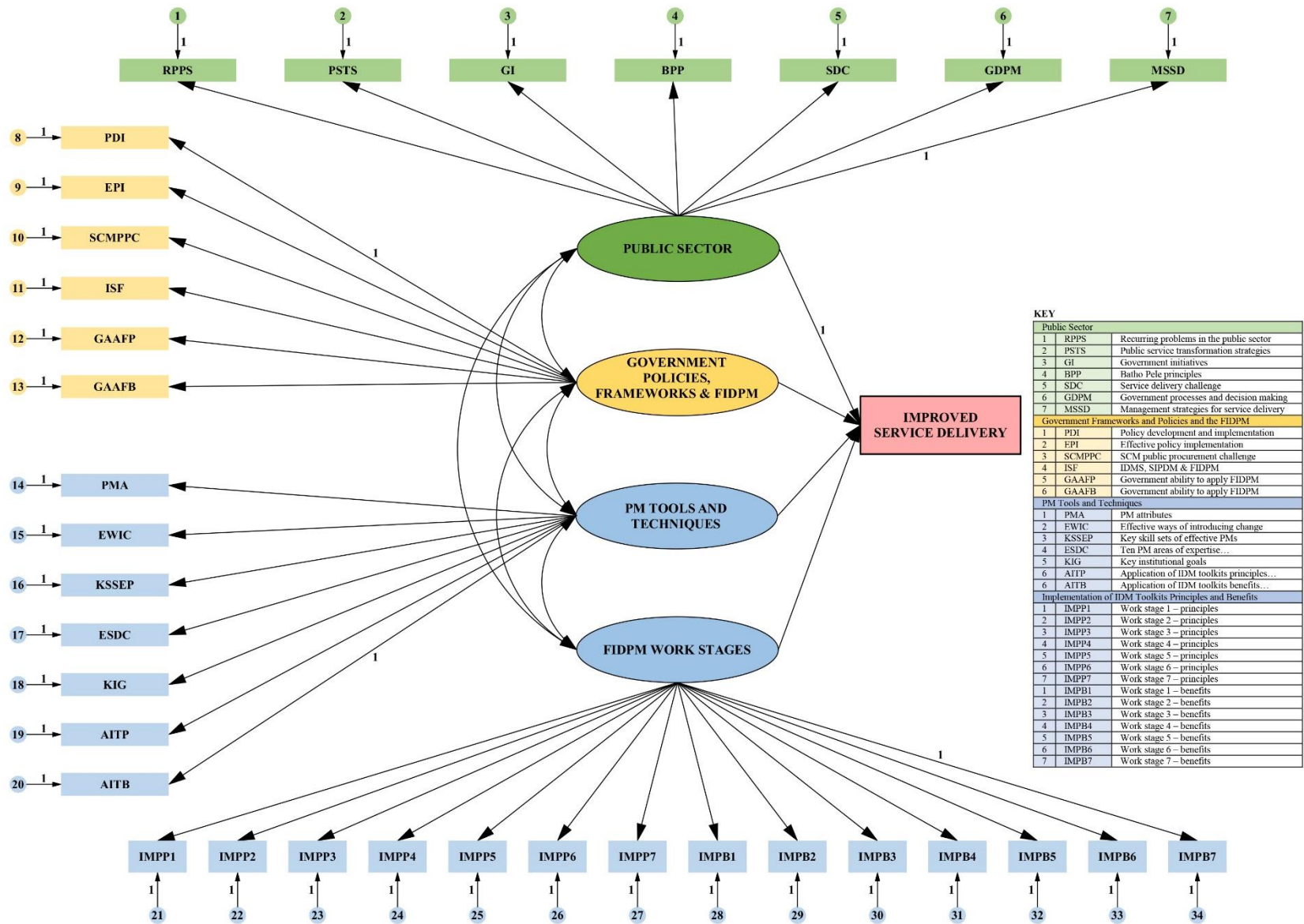


Figure 9.8: The Proposed and Final Model

9.4.3 Fit Indices and Estimates for Leading Drivers

9.4.3.1 The Public Sector

The public sector comprised seven observed variables, namely,

1. Recurring problems in the public sector (RPPS),
2. Public service transformation strategies (PSTS),
3. Government initiatives (GI),
4. Batho Pele principles (BPP),
5. Service delivery challenge (SDC),
6. Government processes and decision making (GPDM), and
7. Management strategies for service delivery (MSSD).

Model Fit for the Public Sector

Table 9.48 indicated that the p-value for the public sector driver is equal to 0.000, RMSEA = 0.378, CFI = 0.911 and SRMR = 0.080. The RMSEA was below the accepted level of fit and did not meet the threshold, while the p-value, CFI and SRMR all indicate an acceptable fit, as they meet the threshold. The overall model fit for the public sector driver was a poor fit. Due to the lack of construct validity, any interpretations based on the public sector scale needed to be interpreted with caution.

Table 9.48: Model Fit for the Public Sector

Chi-Square (p-value) <0.05	RMSEA <0.06	CFI ≥0.90	SRMR <0.08
0.000	0.378	0.911	0.080

Model parameters for the Public Sector

Model parameters are considered by the use of factor loadings which entail the use of standardised and unstandardised factor loadings to determine the directions of association between the observed variable and the latent factor including the size of the item (Pallant, 2020). Unstandardised factor loadings should be used together with standardised factor loadings as they indicate the relationships between the evident variables and latent variables (Tabachnick and Fidell, 2019). In addition, standardised factor loadings assist in determining the importance of one variable is to another and makes interpretation easier (Schumacker and Lomax, 2016). Hair *et al.* (2019) highlighted that a standardised factor loading value >0.50 is considered suitable, while variables greater than 0.5 indicate a good convergent and construct validity of the model. The researcher focused on standardised factor loadings to assist in the interpretation of the results and adopted a value of 0.5 for the minimum threshold.

Standardised residual variances highlight the amount of error as a result of the hypothesised factor for each item, which favours smaller values (Schumacker and Lomax, 2016). The R-square (R^2) value

indicates the true variance in the item which is explained by the latent factor and favours larger factors, >0.25 (Kline 2016). According to Frost (2020) the R-square value ranges indicate:

- .12 or below indicate low,
- between .13 to .25 values indicate medium,
- .26 or above, and above values indicate high effect size

The researcher adopted standardised factor loadings to assist in interpretation of the results. The model parameters were discussed for each driver. The researcher decided regarding whether to proceed or not based on the model fit as indicated by Eaton *et al.* (2019) that the selection of fit indices remains a controversial issue. The researcher decided to continue with investigations and noted any identified problems regarding the subscales and interpreted them with caution.

The model parameters for the public sector depicted in Table 9.49 indicated that the standardised loadings are between 0.605 and 0.946, which is well above the cut-off criteria of 0.5. The R² ranged between 0.366 and 0.896 and indicates a high value as they are all above 0.3. Reliability is therefore confirmed (Frost, 2020). Although the fit indices indicated a poor fit, the standardised model parameters indicated a good fit. When looked at together, the CFA model for the public sector was used in its current format to construct the greater structural model.

Table 9.49: Model Parameters for the Public Sector

No.	Item Ref.	Item Description	Standardised Factor Loadings		Standardised residual variance		R ²	
			Estimate	P-value	Estimate	P-value	Estimate	P-value
1	RPPS	Recurring problems in the public sector	0.605	0.000	0.463	0.000	0.366	0.000
2	PSTS	Public service transformation strategies	0.805	0.000	0.802	0.000	0.648	0.000
3	GI	Government initiatives	0.851	0.000	0.310	0.000	0.724	0.000
4	BPP	Batho Pele principles	0.788	0.000	0.303	0.000	0.621	0.000
5	SDC	Service delivery challenge	0.946	0.000	0.369	0.000	0.896	0.000
6	GDPM	Government processes and decision making	0.928	0.000	0.123	0.000	0.861	0.000
7	MSSD	Management strategies for service delivery	0.935	0.000	0.209	0.000	0.875	0.000

9.4.3.2 Government Frameworks and Policies and the FIDPM

The government frameworks and policies and the FIDPM entailed five observed variables, namely:

1. Policy development and implementation (PDI),
2. Effective policy implementation (EPI),
3. SCM public procurement challenge (SCMPPC),
4. IDMS, SIPDM & FIDPM (ISF), and
5. Government ability to apply FIDPM (GAAFP and GAAFB).

Model Fit for Government Frameworks and Policies and the FIDPM

Table 9.50 illustrated that all four indices met the threshold, which was indicative of a good model fit as the theoretical model of the government policies, frameworks and the FIDPM fitted the empirical data satisfactorily.

Table 9.50: Model Fit for Government Frameworks and Policies and the FIDPM

Chi-Square (p-value) <0.05	RMSEA <0.06	CFI ≥0.90	SRMR <0.08
0.020	0.044	0.906	0.051

Model Parameters for Government Frameworks and Policies and the FIDPM

Table 9.51 highlighted the standardised factor loadings for government frameworks and policies and the FIDPM ranged between 0.752 and 0.925 which falls above the acceptable cut-off. Factor loadings were statistically significant, and the R² was well above the preferred cut-off level, ranging between 0.373 and 0.916. The fit and standardised model parameters suggest that the CFA model for government policies, frameworks and the FIDPM fitted the empirical data well. Therefore, the subscale was used in its refined format to construct the greater structural model.

Table 9.51: Model Parameters for Government Frameworks and Policies and the FIDPM

No.	Item Ref.	Item Description	Standardised Factor Loadings		Standardised residual variance		R ²	
			Estimate	P-value	Estimate	P-value	Estimate	P-value
1	PDI	Policy development and implementation	0.765	0.000	0.720	0.000	0.620	0.000
2	EPI	Effective policy implementation	0.817	0.000	0.493	0.000	0.667	0.000
3	SCMPPC	SCM public procurement challenge	0.925	0.000	0.363	0.000	0.892	0.000
4	ISF	IDMS, SIPDM & FIDPM	0.873	0.000	0.296	0.000	0.916	0.000
5	GAAFP	Government ability to apply FIDPM Principles	0.752	0.000	0.164	0.000	0.907	0.000
6	GAAFB	Government ability to apply FIDPM Benefits	0.916	0.000	0.503	0.000	0.373	0.000

9.4.3.3 Project Management Tools and Techniques

The project management tools and techniques comprised seven observed variables, namely,

1. PM attributes (PMA),
2. Effective ways of introducing change (EWIC),
3. Key skill sets of effective PMs (KSSEP),
4. Ten PM areas of expertise and service delivery challenges (ESDC),
5. Key institutional goals (KIG),
6. Application of IDM toolkits principles and benefits by PM's (AITP, AITB),

7. Implementation of IDM toolkits principles and benefits in FIDPM work stages (IMPP1-7, IMPB1-7)

Model Fit for PM Tools and Techniques

Table 9.52 depicted the p-value, RMSEA, CFI and SRMR for the PM tools and techniques driver met the minimum thresholds, indicating of a good model fit as the theoretical model of the PM tools and techniques fitted the empirical data satisfactorily.

Table 9.52: Model Fit for PMT

Chi-Square (p-value)	RMSEA	CFI	SRMR
0.05	<0.06	≥0.90	<0.08
0.000	0.064	0.914	0.082

Model parameters for PM Tools and Techniques

The standardised factor loading illustrated in Table 9.53 were well above the cut-off level of 0.5, ranging between 0.890 and 0.937. In addition, the R² value ranged between 0.791 and 0.926 which was above the acceptable cut-off level. The fit and standardised model parameters suggest that the CFA model for PM tools and techniques fitted the empirical data well. As a result, the subscale was used in its refined format to construct the greater structural model.

Table 9.53: Model parameters for PM Tools and Techniques

No.	Item Ref.	Item Description	Standardised Factor Loadings		Standardised residual variance		R ²	
			Estimate	P-value	Estimate	P-value	Estimate	P-value
1	PMA	PM attributes	0.902	0.000	0.492	0.000	0.814	0.000
2	EWIC	Effective ways of introducing change	0.912	0.000	0.312	0.000	0.832	0.000
3	KSSEP	Key skill sets of effective PMs	0.901	0.000	0.365	0.000	0.813	0.000
4	ESDC	Ten PM areas of expertise...	0.937	0.000	0.201	0.000	0.878	0.000
5	KIG	Key institutional goals	0.922	0.000	0.122	0.000	0.926	0.000
6	AITP	Application of IDM toolkits principles...	0.935	0.000	0.084	0.000	0.916	0.000
6	AITB	Application of IDM toolkits benefits...	0.890	0.000	0.389	0.000	0.791	0.000

9.4.3.4 Implementation of IDM toolkits principles and benefits in FIDPM work stages (IMPP/IMPB)

The implementation of IDM toolkits principles and benefits in FIDPM work stages form part of the PM tools and techniques driver which comprises principles and benefits implemented during the seven FIDPM work stages.

Model Fit for Implementation of IDM Toolkits Principles and Benefits

Table 9.54 exemplified that the RMSEA, CFI and SRMR did not meet the minimum threshold indicating that the theoretical model for the implementation of IDM toolkits principles and benefits did not satisfactorily fit the empirical data. Therefore, the researcher decided to interpret further with caution.

Table 9.54: Model Fit for IMPP/IMPB

Chi-Square (p-value) 0.05	RMSEA <0.06	CFI ≥0.90	SRMR <0.08
0.000	0.281	0.693	0.257

Model parameters for Implementation of IDM Toolkits Principles and Benefits

The first five items (IMPP1 – IMPP5) of the standardised loadings in Table 9.55 fell below the acceptable 0.5 cut-off level. In addition, the standardised residual variance for the first five items was too high and the R² was below the preferred level. The rest of the items were within the accepted levels. It can therefore be seen that items IMPP1 – IMPP5 were problematic in this subscale and were carefully interpreted with caution.

Table 9.55: Model parameters for Implementation of IDM Toolkits Principles and Benefits

No.	Item Ref.	Item Description	Standardised Factor Loadings		Standardised residual variance		R ²	
			Estimate	P-value	Estimate	P-value	Estimate	P-value
1	IMPP1	Work stage 1 – principles	0.430	0.000	1.317	0.000	.184	0.000
2	IMPP2	Work stage 2 – principles	0.012	0.000	1.659	0.000	.000	0.000
3	IMPP3	Work stage 3 – principles	0.485	0.000	1.206	0.000	.235	0.000
4	IMPP4	Work stage 4 – principles	0.346	0.000	1.596	0.000	.120	0.000
5	IMPP5	Work stage 5 – principles	0.372	0.000	1.474	0.000	.138	0.000
6	IMPP6	Work stage 6 – principles	0.876	0.000	0.210	0.000	.767	0.000
7	IMPP7	Work stage 7 – principles	0.944	0.000	0.095	0.000	.890	0.000
1	IMPB1	Work stage 1 – benefits	0.928	0.000	0.132	0.000	.861	0.000
2	IMPB2	Work stage 2 – benefits	0.919	0.000	0.133	0.000	.844	0.000
3	IMPB3	Work stage 3 – benefits	0.933	0.000	0.140	0.000	.871	0.000
4	IMPB4	Work stage 4 – benefits	0.902	0.000	0.136	0.000	.814	0.000
5	IMPB5	Work stage 5 – benefits	0.952	0.000	0.096	0.000	.906	0.000
6	IMPB6	Work stage 6 – benefits	0.940	0.000	0.131	0.000	.883	0.000
7	IMPB7	Work stage 7 – benefits	0.845	0.000	0.257	0.000	.714	0.000

The statistics presented indicated, good model fit for the public sector, government policies, frameworks and the FIDPM, PM tools and techniques. A poor model fit was identified with the implementation of IDM toolkits principles and benefits items IMPP1 – IMPP5. Although the standardised loadings and standardised residual variances did not meet the acceptable cut-off levels, these items were not removed and interpreted with caution as they play a critical role in the operations of the implementation of

principles unobserved variable. Government cannot achieve progress on public sector service delivery projects without the implementation of work stages 1-5. Therefore, items IMPP6 – 7 are not achievable without IMPP1 -5.

The primary objective of the research objective entailed evaluating the proposed conceptual model. As a result, model modification fell out of the identified scope of this study and was not implemented. According to Kline (2016) model re-specification and modification should be administered rigorously based on theoretical evidence. Therefore, it was deemed not necessary to re-specify the structural model.

9.4.4 Proposed Hypothesis

The conceptual model for this study was developed on 22 hypothesised relationships within three leading drivers, the public sector, government policies, frameworks and the FIDPM, and PM tools and techniques. These included:

Leading Variable/ Driver 1 – The Public Sector

- H1: A positive relationship is predicted between Recurring Problems in the Public Sector and the public sector.
- H2: A positive relationship is predicted between Public Service Transformation Strategies and the public sector.
- H3: A positive relationship is predicted between Government Initiatives and the public sector.
- H4: A positive relationship is predicted between Batho Pele Principles and the public sector.
- H5: A positive relationship is predicted between Service Delivery Challenges and the public sector.
- H6: A positive relationship is predicted between Government Processes and Decision Making and the public sector.
- H7: A positive relationship is predicted between Management Strategies for Service Delivery and the public sector.

Leading Variable/ Driver 2 – Government Policies, Frameworks and the FIDPM

- H8: A positive relationship is predicted between Policy Development and Implementation and the FIDPM.
- H9: A positive relationship is predicted between Effective Policy Implementation and the FIDPM.
- H10: A positive relationship is predicted between SCM Public Procurement Challenges and the FIDPM.
- H11: A positive relationship is predicted between IDMS, SIPDM & FIDPM and the FIDPM.
- H12: A positive relationship is predicted between Government Ability to Apply the FIDPM and the FIDPM.

Leading Variable/ Driver 3 – PM Tools and Techniques

- H13: A positive relationship is predicted between PM Attributes and PM tools and techniques.
- H14: A positive relationship is predicted between Effective Ways of Introducing Change and PM tools and techniques.
- H15: A positive relationship is predicted between Skill Sets of Effective PM’s and PM tools and Techniques.
- H16: A positive relationship is predicted between Ten Areas of Expertise and Service Delivery.
- H17: A positive relationship is predicted between Key Institutional Goals and PM tools and techniques.
- H18: A positive relationship is predicted between Application of IDM Toolkits Principals and Benefits by PM’s and PM tools and techniques.

PM tools and techniques - Implementation of IDM Toolkits Principles and Benefits

- H19: A positive relationship is predicted between Implementation of IDM Toolkits Principals and Benefits in FIDPM Work Stages and PM tools and techniques.

Dependent Variable – Improved Service Delivery

- H20: A positive relationship is predicted between The Public Sector and improved service delivery.
- H21: A positive relationship is predicted between The FIDPM and improved service delivery.
- H22: A positive relationship is predicted between PM Tools and Techniques and improved service delivery.

9.4.4.1 Hypothesis Analysed

Leading Variable/ Driver 1 – The Public Sector

Table 9.56 highlights for the public sector driver, out of the seven unobserved variables that were discussed, four were accepted and three could not be rejected. This is based on the *p*-value which indicates that *p*-value less or equal to .005 ($p \leq .005$) is statistically significant, while *p*-value more than .005 ($> .005$) is not statistically significant, further indicating strong evidence for the null hypothesis. As a result, the researcher could not reject the three hypotheses.

Table 9.56: Leading Variable/ Driver 1 – The Public Sector

H1: A positive relationship is predicted between Recurring Problems in the Public Sector and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
Recurring Problems in the Public Sector	<---	Public Sector	0.401	.205	Accepted
H2: A positive relationship is predicted between Public Service Transformation Strategies and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome

Public Service Transformation Strategies	<---	Public Sector	0.011	.084	Accepted
H3: A positive relationship is predicted between Government Initiatives and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
Government Initiatives	<---	Public Sector	-0.045	.146	Accepted
H4: A positive relationship is predicted between Batho Pele Principles and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
BPP	<---	Public Sector	0.791	.671	Accepted
H5: A positive relationship is predicted between Service Delivery Challenges and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
Service Delivery Challenges	<---	Public Sector	0.945	***	Could Not Be Rejected
H6: A positive relationship is predicted between Government Processes and Decision Making and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
Government Processes and Decision Making	<---	Public Sector	0.924	***	Could Not Be Rejected
H7: A positive relationship is predicted between Management Strategies for Service Delivery and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
Management Strategies for Service Delivery	<---	Public Sector	0.935	***	Could Not Be Rejected
*** represents .000					

Leading Variable/ Driver 2 – Government Policies, Frameworks and the FIDPM

Table 9.57 indicates that all six hypotheses for the Government Policies, Frameworks and the FIDPM driver could not be rejected as their *p*-value were less than .005, and therefore not statistically significant, indicating the presence of null hypotheses.

Table 9.57: Leading Variable/ Driver 2 – Government Policies, Frameworks and the FIDPM

H8: A positive relationship is predicted between Policy Development and Implementation and Government Policies, Frameworks and the FIDPM.					
Proposed Hypothesis			Estimate	P=	Outcome
Policy Development and Implementation	<---	Government Policies, Frameworks and the FIDPM	0.340	.004	Could Not Be Rejected
H9: A positive relationship is predicted between Effective Policy Implementation and Government Policies, Frameworks and the FIDPM.					
Proposed Hypothesis			Estimate	P=	Outcome
Effective Policy Implementation	<---	Government Policies, Frameworks and the FIDPM	0.816	***	Could Not Be Rejected
H10: A positive relationship is predicted between SCM Public Procurement Challenges and Government Policies, Frameworks and the FIDPM.					
Proposed Hypothesis			Estimate	P=	Outcome
SCM Public Procurement Challenges	<---	Government Policies, Frameworks and the FIDPM	0.941	***	Could Not Be Rejected
H11: A positive relationship is predicted between IDMS, SIPDM & FIDPM and Government Policies, Frameworks and the FIDPM.					
Proposed Hypothesis			Estimate	P=	Outcome

IDMS, SIPDM & FIDPM	<---	Government Policies, Frameworks and the FIDPM	0.976	***	Could Not Be Rejected
H12: A positive relationship is predicted between Government Ability to Apply the IDM Principles and Benefits through the FIDPM and Government Policies, Frameworks and the FIDPM.					
Proposed Hypothesis			Estimate	P=	Outcome
Government Ability to Apply IDM Principles	<---	Government Policies, Frameworks and the FIDPM	0.951	***	Could Not Be Rejected
Government Ability to Apply IDM Benefits	<---	Government Policies, Frameworks and the FIDPM	0.422	.002	Could Not Be Rejected
*** represents .000					

Leading Variable/ Driver 3 – PM Tools and Techniques

Table 9.58 depicted all hypothesis for the third leading driver, PM tools and techniques, could also not be rejected as they all displayed *p*-value equals to .000, which is below the cut-off of .005.

Table 9.58: Leading Variable/ Driver 3 – PM Tools and Techniques

H13: A positive relationship is predicted between PM Attributes and PM tools and techniques.					
Proposed Hypothesis			Estimate	P=	Outcome
PM Attributes	<---	PM Tools and Techniques	0.904	***	Could Not Be Rejected
H14: A positive relationship is predicted between Effective Ways of Introducing Change and PM tools and techniques.					
Proposed Hypothesis			Estimate	P=	Outcome
Effective Ways of Introducing Change	<---	PM Tools and Techniques	0.913	***	Could Not Be Rejected
H15: A positive relationship is predicted between Key Skill Sets of Effective PM's and PM tools and techniques.					
Proposed Hypothesis			Estimate	P=	Outcome
Key Skill Sets of Effective PM's	<---	PM Tools and Techniques	0.901	***	Could Not Be Rejected
H16: A positive relationship is predicted between Ten Areas of Expertise and Service Delivery Challenges and PM tools and techniques.					
Proposed Hypothesis			Estimate	P=	Outcome
Ten Areas of Expertise and Service Delivery Challenges	<---	PM Tools and Techniques	0.936	***	Could Not Be Rejected
H17: A positive relationship is predicted between Key Institutional Goals and PM tools and techniques.					
Proposed Hypothesis			Estimate	P=	Outcome
Key Institutional Goals	<---	PM Tools and Techniques	0.962	***	Could Not Be Rejected
H18: A positive relationship is predicted between Application of IDM Toolkits Principals and Benefits by PM's and PM tools and techniques.					
Proposed Hypothesis			Estimate	P=	Outcome
Application of IDM Toolkits Principals by PM's	<---	PM Tools and Techniques	0.976	***	Could Not Be Rejected
Application of IDM Toolkits Principals and Benefits by PM's	<---	PM Tools and Techniques	0.084	.058	Accepted

*** represents .000

PM Tools and Techniques - Implementation of IDM Toolkits Principles and Benefits

Table 9.59 illustrates three hypotheses for the application and implementation of the PM Tools and Techniques were accepted, with the rest of the hypotheses could not be rejected.

Table 9.59: Leading Variable/ Driver 3 - PM tools and techniques - Implementation of IDM Toolkits Principles and Benefits

H19: A positive relationship is predicted between Implementation of IDM Toolkits Principals and Benefits in FIDPM Work Stages and PM tools and techniques.					
Proposed Hypothesis			Estimate	P=	Outcome
Work Stage 1 – Principles	<---	PM Tools and Techniques	.437	***	Could Not Be Rejected
Work Stage 2 – Principles	<---	PM Tools and Techniques	.014	.774	Accepted
Work Stage 3 – Principles	<---	PM Tools and Techniques	.489	.145	Accepted
Work Stage 4 – Principles	<---	PM Tools and Techniques	.348	***	Could Not Be Rejected
Work Stage 5 – Principles	<---	PM Tools and Techniques	.375	***	Could Not Be Rejected
Work Stage 6 – Principles	<---	PM Tools and Techniques	.879	.032	Accepted
Work Stage 7 – Principles	<---	PM Tools and Techniques	.944	***	Could Not Be Rejected
Work Stage 1 – Benefits	<---	PM Tools and Techniques	.928	***	Could Not Be Rejected
Work Stage 2 – Benefits	<---	PM Tools and Techniques	.917	***	Could Not Be Rejected
Work Stage 3 – Benefits	<---	PM Tools and Techniques	.932	***	Could Not Be Rejected
Work Stage 4 – Benefits	<---	PM Tools and Techniques	.901	***	Could Not Be Rejected
Work Stage 5 – Benefits	<---	PM Tools and Techniques	.951	***	Could Not Be Rejected
Work Stage 6 – Benefits	<---	PM Tools and Techniques	.941	***	Could Not Be Rejected
Work Stage 7 – Benefits	<---	PM Tools and Techniques	.844	***	Could Not Be Rejected

*** represents .000

Dependent Variable – Improved Service Delivery

Table 9.60 highlights two of the three dependent variables between public sector and improved service delivery, including the FIDPM and improved service delivery were accepted. However, the third one, PM tools and techniques and improved service delivery could not be rejected.

Table 9.60 Dependent Variable – Improved Service Delivery

H20: A positive relationship is predicted between The Public Sector and Improved Service Delivery.					
Proposed Hypothesis			Estimate	P=	Outcome
Public Sector	<-->	Improved Service Delivery	.053	.021	Accepted
H21: A positive relationship is predicted between The FIDPM and improved service delivery.					
Proposed Hypothesis			Estimate	P=	Outcome
Government Policies, Frameworks and the FIDPM	<-->	Improved Service Delivery	.133	.007	Accepted
H22: A positive relationship is predicted between PM Tools and Techniques and improved service delivery.					
Proposed Hypothesis			Estimate	P=	Outcome
PM Tools and Techniques	<-->	Improved Service Delivery	.493	***	Could Not Be Rejected

*** represents .000

9.4.4.2 Hypotheses Summary and Discussion

This study focused on identifying whether the hypothesised factors for the drivers for improving public sector service delivery could be validated including whether the hypothesised path between the drivers and dependent variables in the model were practical and significant. Tables 9.55 – 9.59 presented the hypotheses and highlighted those accepted and those that could not be rejected based on the p -value.

Out of a total of 22 tested hypotheses, eight were accepted (36.36%) and 14 could not be rejected. In this study, the null hypothesis could not be rejected, and the proposed alternative hypothesis accepted. Tabachnick and Fidell (2019) highlighted, where the p -value was less than 0.05 ($p \leq 0.05$) it is statistically significant which indicates strong evidence against the null hypothesis, as there is less than a 5% probability the null hypothesis is correct (and the results are random). However, rejecting the null hypothesis as it is below the threshold of significance ($p \leq 0.05$), does not mean that there is a 95% probability that the alternate hypothesis is true. The p -value is conditional upon the null hypothesis being true and is not related to the fact that the alternative hypothesis is true. The analysis of the final path model indicated the practical and significant hypothesised relationships between the drivers and unobserved variables.

The public sector driver shared a relationship with four unobserved variables (H_1 to H_4). While the PM Tools and Techniques driver shared a relationship with two unobserved variables (H_{18} and H_{19}). In addition, the public sector driver (H_{20}) and government policies, frameworks and the FIDPM driver (H_{21}) both shared a relationship with dependent variable, improved service delivery. These relationships are discussed in the following sub-sections. Table 9.61 presents a summary of the accepted hypothesis. Figure 9.9 presents the final supported path diagram.

Table 9.61: Summary of Accepted Hypothesis

Leading Variable/ Driver 1 – The Public Sector					
H1: A positive relationship is predicted between Recurring Problems in the Public Sector and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
RPPS	<---	Public Sector	0.401	.205	Accepted
H2: A positive relationship is predicted between Public Service Transformation Strategies and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
Public Service Transformation Strategies	<---	Public Sector	0.011	.084	Accepted
H3: A positive relationship is predicted between Government Initiatives and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
Government Initiatives	<---	Public Sector	-0.045	.146	Accepted
H4: A positive relationship is predicted between Batho Pele Principles and the public sector.					
Proposed Hypothesis			Estimate	P=	Outcome
Batho Pele Principles	<---	Public Sector	0.791	.671	Accepted
Leading Variable/ Driver 3 - PM tools and techniques					
H18: A positive relationship is predicted between Application of IDM Toolkits Principals and Benefits by PM's and PM tools and techniques.					
Proposed Hypothesis			Estimate	P=	Outcome
Application of IDM Benefits...	<---	PM Tools Application	0.084	.058	Accepted
H19: A positive relationship is predicted between Implementation of IDM Toolkits Principals and Benefits in FIDPM Work Stages and PM tools and techniques.					
Proposed Hypothesis			Estimate	P=	Outcome
Work Stage 2 - Principles	<---	PM Tools Implementation	.014	.774	Accepted
Work Stage 3 - Principles	<---	PM Tools Implementation	.489	.145	Accepted
Work Stage 6 - Principles	<---	PM Tools Implementation	.879	.032	Accepted
Dependent Variable – Improved Service Delivery (ISD)					
H20: A positive relationship is predicted between The Public Sector and improved service delivery.					
Proposed Hypothesis			Estimate	P=	Outcome
Public Sector	<-->	Improved Service Delivery	.053	.021	Accepted
H21: A positive relationship is predicted between The FIDPM and improved service delivery.					
Proposed Hypothesis			Estimate	P=	Outcome
Government Policies, Frameworks and the FIDPM	<-->	Improved Service Delivery	.133	.007	Accepted

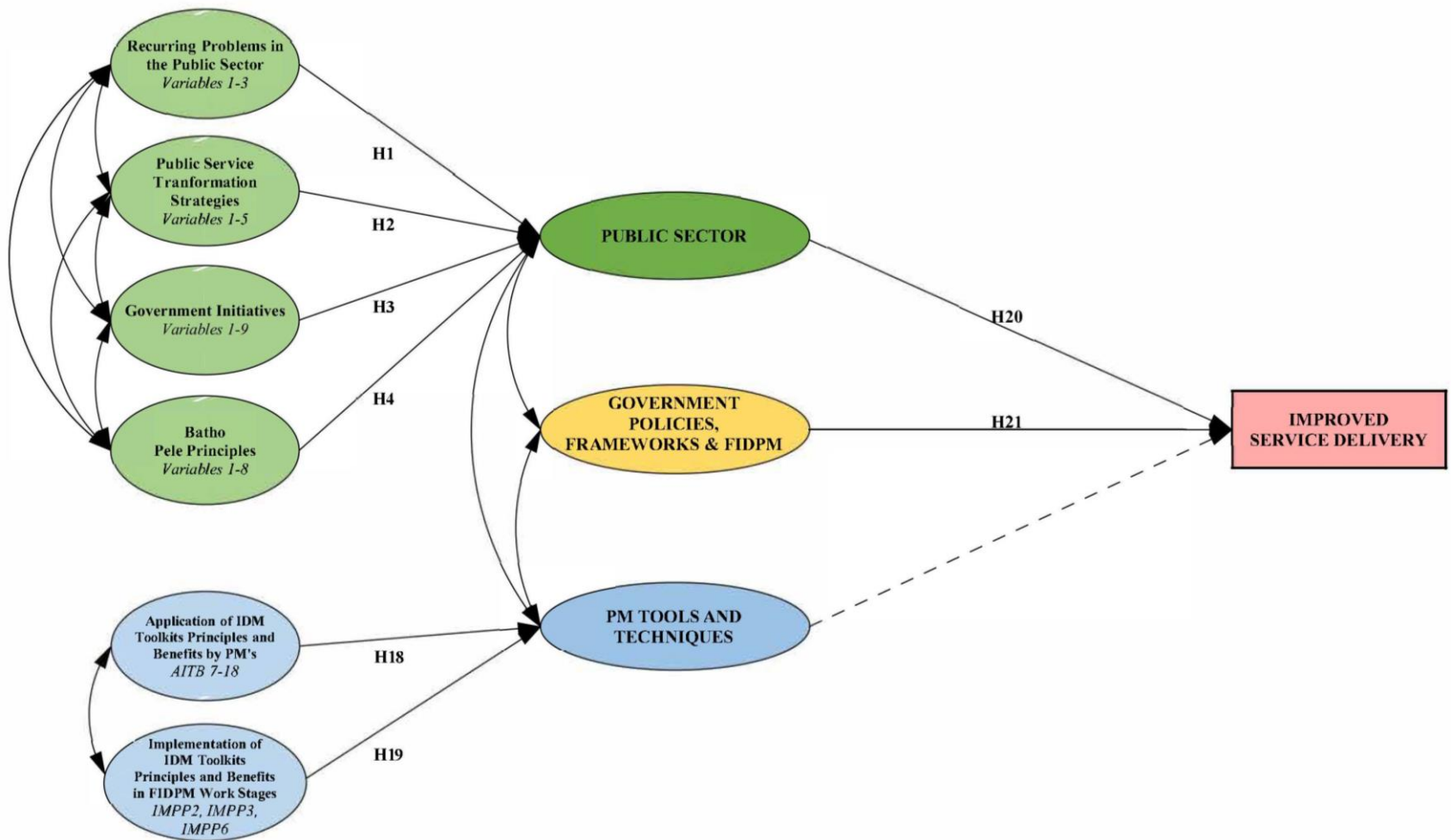


Figure 9.9. The Final Path Diagram

The Public Sector and the Unobserved Variables

H1: A positive relationship is predicted between Recurring Problems in the Public Sector and the public sector.

Fourie and Poggenpoel (2016) identified there are recurring problems in the public sector which include, constant recurrence of findings, important problem areas in the public sector are resource optimisation, accountability, and a culture of non-compliance, and the root causes of problems are not being sufficiently addressed.

Various authors have conducted studies on public sector challenges and how to deal with them, rather than the root causes of the problems (Jarrar and Schimua, 2007; Modell, 2005; Montiel, 2011). Root causes stem from incompetent public servants, a lack of accountability, poor human resources practices, inadequate procurement practices and a lack of leadership (Janse van Rensburg, 2014). In addition, fundamental problem areas include service delivery difficulties, poor management of finances, high level of unemployment, nepotism and corruption (Akinboade, Kinfack and Mokwena, 2012). Finally, ineffective leadership is the ultimate key problem and that has been evident in the South African public sector (Janse van Rensburg, 2014).

Recurring problems in the public sector have been identified as a critical area that requires urgent government intervention. This was reinforced by the outcomes of the Delphi study which revealed that this is a pertinent issue which needed to be explored through the survey.

The results from the Likert scale analysis highlighted recurring problems are still evident in the public sector. This indicated that the public sector needs to urgently pursue and address the root causes of its problems. Government must ensure they employ qualified, experienced and skilled public servants who are able to effectively implement and achieve service delivery goals. By addressing the recurring problems in the public sector will service delivery improve.

Therefore, the accepted hypothesis is indicative, that a positive relationship does exist between Recurring Problems in the Public Sector and the public sector.

H2: A positive relationship is predicted between Public Service Transformation Strategies and the public sector.

The intent of service delivery to South African citizens is made clear and is confirmed in the vision and mission statements for the public service provided for by the government in the White Paper on the Transformation of the Public Service. The White Paper on the Transformation of the Public Service is

the most important policy statement on public service delivery and is very clear and professional about the importance of service delivery by the public service (White Paper on Transforming Public Service Delivery, 1997). The importance of improved service delivery is explicit. Government is guided by the ideals of the Constitution for public service and is further supported by the White Paper on the Transformation of the Public Service which promotes the definite need to develop strategies for continuous improvement of service delivery (White Paper on Transforming Public Service Delivery, 1997). However, government are not in alignment with public service transformation strategies. In South Africa, detailed regulation and central prescription has resulted in excessive bureaucracy and lengthy procedures which were against the interests of customers, internal and external (Public Service Commission Report, 2008; Schwella, 2001).

Government needs to ensure they are aligned to public service transformation strategies towards improving service delivery to citizens. The Delphi study highlighted the importance for this unobserved variable to be investigated further and identify whether government is aligned to the ideals of the constitution.

The Likert scale analysis indicated, public service transformation strategies are still not aligned by government. This is of serious concern to the public sector as government have been found to not link service delivery mission statements to service guarantees. Targeted populations in urgent need of public services were not identified. Services were not in alignment to affordability or redress. Service standards, outputs and targets were not defined and could not be bench marked against international standards. Service delivery was not managed by sound human and financial resource management. Finally, limited customer care in relation to client sensitive service delivery was exhibited the public sector.

As a result, the accepted hypothesis does have a positive relationship between Public Service Transformation Strategies and the public sector.

H3: A positive relationship is predicted between Government Initiatives and the public sector.

Schiller (1993) argued that government intervention is to address market failures. Fourie (2014) further highlighted in South Africa, improving service delivery is critical for growing and developing the economy. Although government should be acknowledged for major infrastructure development initiatives, service delivery performance over the pass decades indicate that progress has been uneven across the country with different issues facing different areas, reflecting variable socio-economic conditions and municipal incompetence (SA Government New Agency Report, 2017). In the countries third decade of constitutional democracy, serious concern has been raised about the government and its

ability to deliver public services that its citizens painfully yearn for and are entitled to (Khumalo *et al.* 2017; Olaregaju and Ibrahim, 2020).

The Delphi study revealed that this is a critical area and it was important to explore as the link between government initiatives and building a platform for growth of public services needed to be investigated.

In addition, the Likert scale analysis indicated that government initiatives are lacking. Government displayed poor initiatives regarding accountability, insufficient suitable infrastructure and logistics, no improvement in performance management and minimal innovative partnerships. Furthermore, government initiatives also lacked in terms of equitability, poor competitive input prices, limited skills and technology and regulation was inefficient. Building a platform for future growth remains a challenge for government as their service delivery initiatives are still poorly experienced, resulting in poor implementation of service delivery.

The accepted hypothesis therefore confirms that a positive relationship does exist between Government Initiatives and the public sector.

H4: A positive relationship is predicted between Batho Pele Principles and the public sector.

The success of governments programmes and policies depend on the public service and Batho Pele is a belief set that is used to improve service delivery in the public service (Public Service Commission Report, 2008; Schwella, 2001). Since the introduction of the Batho Pele framework for transforming public service delivery in 1997, this policy was seen as a commendable intervention by the democratic state. However, the commendable elements of the policy were reduced by implementation short comings (Batho Pele Policy Review, 2003). Poor implementation outcomes of Batho Pele have been reported over decades since its implementation (PSC, 2000; PSC, 2008, DPSA, 2018). Key findings included:

- Public service lacked skills necessary for the application of Batho Pele principles (DPSA, 2018).
- Fundamentals such as attitudes, beliefs, skills, structure, systems and processes were not in place for Batho Pele to succeed with public service delivery (DPSA, 2018)
- Batho Pele was a mere listing of principles, without any indication of implementation (PSC, 2000).
- Batho Pele had not been integrated with performance management and strategic plans (PSC, 2008).

Batho Pele principles were developed with the intent of improving service delivery through consistent and effective implementation by the public sector. The Delphi study highlighted it was imperative for the survey to examine whether Batho Pele principles are being implemented by the public sector towards improving service delivery.

The Likert scale analysis signified that Batho Pele principles are not being implemented or adhered to by government. The following key principles of Batho Pele, namely, consultation, standards, redress, access, courtesy, information, openness and transparency and, value for money were not effectively applied since its implementation over 20 years ago.

Through an extensive EFA and CFA, the accepted hypothesis confirmed a positive relationship does exist between Batho Pele Principles and the public sector.

PM Tools and Techniques and the Unobserved Variables

H18: A positive relationship is predicted between Application of IDM Toolkits Principles and Benefits (AITB) by PM's and PM tools and techniques.

The FIDPM recognises that project management plays a critical role in the delivery of public services in South Africa as all spheres of government structures implement and deliver services and further highlighted the minimum requirements for the implementation of the IDMS through the infrastructure delivery management project processes (FIDPM, 2019, IDMS, 2019). The IDMS (2019) exemplifies fundamental principles towards ensuring the effective development and implementation of infrastructure strategy and further notes through the implementation of the principles, key benefits are achievable.

Project management has been underlined as a critical role player in the delivery of public services in the public sector (FIDPM, 2019; Knipe *et al.* 2016). In addition, using project management processes, tools and techniques puts a sound foundation in place for organisations to achieve their goals and objectives (PMBOK, 2017). Papke-Shields *et al.* (2017) further indicated that there is empirical evidence supporting a positive relationship in project management practices and project success, implying that project management practices or standards inherently increase prospects of project success. Project management can therefore support the achievement of institutional goals and plays an important role towards innovative delivery approaches in public service (Pollitt and Bouckaert, 2000; Srivannaboon and Milosevic, 2006).

This indicated, PMs are in an opportune position to assist government with the application of IDM toolkits principles and benefits. As a result, the Delphi study further reinforced through an iterative

process, the need to investigate whether PMs are able to apply the IDM toolkits principals and benefits through the FIDPM towards assisting government improve public service delivery.

The Likert scale analysis illustrated PMs agreed with applying the IDM toolkits principles in order to achieve the benefits through all seven stages the FIDPM. Key highlights from the data analysis indicated PMs are able to assist government build and improve capacity which is of serious concern. Government needs to ensure that they have skilled resources to implement service delivery policy. In addition, government should be consistent with policy implementation. Skilled, capacitated and experienced public servants in government will ensure policy implementation improves and remains consistent. More importantly, government were found not be in alignment with benefits aligned to principles of Batho Pele which requires urgent support to resolve. Finally, government lacks control due to poor decision making within infrastructure delivery and procurement management processes which is a fundamental problem that requires robust intervention. Service delivery challenges in South Africa will never be addressed until such time that government vigorously responds to the concerns raised through the data analysis.

It was noted that the IDM benefits are achievable through the implementation of the principles. However, through the extensive EFA and CFA conducted, the principles were removed in order to obtain a better model fit. Therefore, only the benefits were retained.

The accepted hypothesis therefore confirmed that a positive relationship does exist between Application of IDM Toolkits Benefits (AITB) by PM's and PM tools and techniques.

H19: A positive relationship is predicted between Implementation of IDM Toolkits Principles (IMPP2, IMPP3, IMPP6) and Benefits in FIDPM Work Stages and PM tools and techniques.

A service delivery review conducted by National Treasury in 2002 saw the development and implementation of the IDMS which was chosen as the government wide system for infrastructure delivery, indicating governments initiative for improving service delivery (FIDPM, 2019). The infrastructure delivery management system (IDMS) is government's policy for implementing its strategy to enhance socio-economic growth and development through infrastructure delivery and he IDMS principles and benefits aim to assist in successful and robust policy implementation (IDMS, 2019).

Author such as Chipkin and Lipietz (2012) and Muthien (2013) highlighted that South Africa lacks a coherent model for public sector reform including public management. The importance of the public sector's capability to successfully provide infrastructure service delivery to the public underpins the

platform upon which society depends and yet in many cases the causes of infrastructure failure can be traced back to a lack of good governance, poor procurement and inadequate delivery management practices, all of which are under the control of government departments (Watermeyer, 2018). The assessment report conducted on the IDMS identified several gaps and hold points in the infrastructure delivery management chain which identified the following root causes, amongst others, poor planning and a lack of skills including inappropriate skills in technical positions. A lack of uniformity in procurement procedures, and poor reporting and monitoring (IDMS, 2019). This indicated that the implementation and sustainability of the IDMS stills remains a challenge.

It is of serious concern that government lacks the skills and capacity to effectively implement the IDMS as intended by National Treasury towards improving service delivery. This was further reinforced through the Delphi study which indicated that it is imperative to examine whether the IDM principals and benefits are in fact implemented by government on public sector projects through the FIDPM work stages.

The Likert scale analysis identified that the IDM toolkits principals need to be effectively implemented in order to achieve the benefits offered. Government lacks the ability to implement the IDM toolkits principles during FIDPM 7 work stages. During the implementation of the first 5 work stages the IDM principles were not comprehensively recognisable, but became apparent, yet not convincing in the last 2 work stages. Without the effective implementation of the IDM principles, the benefits were not consistently achievable through all 7 work stages.

The EFA and CFA conducted indicated that the implementation of principles for work stage 2 (IMPP2), principles work stage 3 (IMPP3) and principles work stage 6 (IMPP6) were retained as they generated a good model fit, while the remaining principles and benefits work stages were removed as they did not allow for a good model fit.

Therefore, the accepted hypothesis reinforced that a positive relationship does exist between Implementation of IDM Toolkits Principals (IMPP2, IMPP3, IMPP6) in FIDPM Work Stages and PM tools and techniques.

The Public Sector and the Dependent Variable

H20: A positive relationship is predicted between The Public Sector and improved service delivery.

The South African public sector is highlighted as a key component of the country's economy and plays a critical role in economic growth and development. However, government faces many challenges when addressing service delivery (Curristine, 2005). In addition, many studies conducted on public sector

challenges emphasise how to deal with them which focus on only symptoms rather than the root cause (Jarrar and Schimua, 2007; Modell, 2005; Moe and Paivarinta, 2013; Montiel, 2011).

Numerous critical aspects hinder public service delivery which include capacity, skills shortages and incompetent public servants, a lack of accountability (Provincial Treasury, 2019), poor human resources practices (Akinboade, Kinfack and Mokwena, 2012), inadequate procurement practices and a lack of leadership (Janse van Rensburg, 2014), service delivery difficulties (Akinboade, Kinfack and Mokwena, 2012), poor management of finances and high level of unemployment (Provincial Treasury, 2019), nepotism and corruption (Janse van Rensburg, 2014; Provincial Treasury, 2019).

This stressed that the public sector performance has a direct impact on improved service delivery. Government needs an effective and efficient public sector which is responsible, capable and accountable of delivering public services in a manner that is satisfactory to its citizens. The Delphi study supported the literature through identifying seven unobserved variables namely, (1) recurring problems in the public sector, (2) public service transformation strategies, (3) government initiatives, (4) Batho Pele principles, (5) service delivery challenges, (6) government processes and decision making and (7) management strategies for service delivery which needed to be investigated towards identifying the impact the public sector has on improved service delivery.

Thereafter the Likert scale analysis depicted recurring problems are still evident in the public sector, while public service transformation strategies are still not aligned by government. Government initiatives are lacking and Batho Pele principles are not being implemented or adhered to. In addition, service delivery challenges are still present and government processes and decision making are hampering the progress of service delivery. Finally, management strategies for service delivery require adjustment to align to international best practice requirements.

Therefore, accepted hypothesis confirmed that a positive relationship does exist The Public Sector and improved service delivery.

Government Policies, Frameworks and the FIDPM and the Dependent Variable

H21: A positive relationship is predicted between The FIDPM and improved service delivery.

Public service and service delivery policies were developed to deal with the simultaneous transformation and quest for improved, service delivery orientated public service in South Africa (Schwella, 2001). However, to date they have not achieved their targets. Public service delivery evaluation reports highlighted several critical challenges remain through the development and use of service standards to access service delivery. These included no service standards in departments (PSC, 2018). A lack of leadership commitment, instability in leadership positions and ineffective performance

management (DPISA, 2018). In addition, instability resulting from repeated changes in policy including under staffing and skills shortages (National Planning Commission, 2011; PSC, 2018). As well as, poor implementation, where particular interpretations and interests have distorted the original intentions and spirit of government policies (Franks, 2014)

Recent policy developments placed greater support on public procurement as a tool for achieving economic transformation (Davey and Getenby (2017). However, Ambe and Badenhorst-weiss (2012) and Bolton (2006) argued public procurement practitioners require specific knowledge about procurement objectives and policies to manage procurement processes effectively. Emphasising that public procurement is still a challenge which does not align to the procurement requirements in the FIPDM. Post 1994, service delivery in South Africa has seen decades of challenges (Ngcamu, 2019). Government has developed and implemented numerous service delivery policies and frameworks, however, to date serious service delivery challenges are still unresolved (Masiya *et al.* 2019). As an initiative towards ensuring a systematic and structured approach for infrastructure procurement and delivery management for the successful delivery of construction projects, National Treasury implemented the Framework for Infrastructure Delivery and Procurement Management (FIDPM) in October 2019.

Successful infrastructure delivery does not rely solely on effective project management and the built environment professional. The role of government departments is crucial in terms of setting the direction and providing effective policy and governance (Watermeyer, 2018). The Delphi study brought to light five unobserved variables, namely, (1) policy development and implementation, (2) effective policy implementation, (3) SCM public procurement challenges, (4) IDMS, SIPDM & FIDPM and (5) government ability to apply the IDMS principals and benefits through the FIDPM which needed further assessment to examine government policies, frameworks and the FIDPM impact on service delivery.

Thereafter, the Likert scale analysis discovered that policy development and implementation are ineffective and do not support successful service delivery. Government is not effective in policy implementation and supply chain management as a strategic tool still faces public procurement challenges. In addition, PMs are aware of the IDMS, SIPDM and FIDPM supporting the initiative that PMs are able to assist government towards improving service delivery. Finally, government is not effectively implementing the principles and benefits the IDMS offers through the implementation of the FIDPM.

As a result, the accepted hypothesis concurs, that a positive relationship does exist between The FIDPM and improved service delivery.

9.5 Chapter Summary

This chapter discussed the results analysis of the survey. More specially, it presented Cronbach's Alpha which confirmed strong internal consistency and reliability of the data. Thereafter the descriptive statistics were calculated using SPSS Version 27 and were discussed regarding the mean, median, mode and standard deviation. In addition, skewness and kurtosis were also calculated which adopted robust maximum likelihood to address non-normal data. The chapter further presented multivariate analysis entailing EFA, CFA and SEM. KMO and Bartlett's test for sphericity was implemented to determine the suitability of the data for factor analysis. The results from the exploratory factor analysis confirmed that drivers, namely, the public sector, government policies, frameworks and the FIDPM, and PM tools and techniques for improved service delivery were valid and reliable. In addition, the factors showed positive and strong relationships to the respective drivers. CFA provided the goodness for fit statistics by bridging EFA with SEM. Confirmatory factor analysis validated the hypothesised factors on the three drivers for improved service delivery, (1) the public sector, (2) government policies, frameworks and the FIDPM, and (3) project management tools and techniques. The conceptual model was tested for model fit using path modelling and Amos Version 26. Structural equation modelling analysed and assessed the hypothesised path between the drivers and dependent variables in the model for practicality and significance. Out of a total of 22 tested hypotheses, eight were accepted (36.36%) and 14 could not be rejected. These were presented in a final path diagram which depicted the relationships between the hypothesised paths were practical and significant.

CHAPTER 10 – CONCLUSIONS AND RECOMMENDATIONS

10.1 Introduction

The final chapter of this study draws closure on by summarising the key research findings and outputs. A summary of the research is discussed before revisiting the research questions, aims and objectives. Thereafter, the recommendations are discussed, and the chapters concludes with recommendations for future research.

10.2 Summary of the Literature and Contribution to the Body of Knowledge

The purpose of this study was to investigate the implementation of the FIDPM and PMs ability to apply infrastructure delivery management tools and techniques the IDMS offers through the implementation of the FIDPM during the project management processes towards assisting government improve public sector service delivery. The literature highlighted the following:

The Public Sector

The public sector was identified as a key driver for the implementation of service delivery in South Africa and is required to ensure the general welfare of all South Africans by delivering public goods and services while playing a critical role on the economy. In addition, a well-functioning public sector needs to be effective and efficient in fulfilling its responsibilities and is mandated to provide public goods and services in a manner that responds adequately to the needs of its stakeholders constantly changing environment. The roots of the public sectors success or failures lies in the economic policies and decisions around how best the public sector is able to produce optimal output. It is therefore key for the public sector to be able to address challenges which include services and infrastructure delivery.

Government Policies, Frameworks and the FIDPM

Public service policies since the new government in 1994 attempted to deal with the complex needs of service delivery institutions and service delivery itself. As a result, public service and service delivery polices were designed to be disseminated and deal with the simultaneous transformation and pursue an improved service delivery orientated public service in South Africa. Public service delivery still exhibits challenges currently (2021) raised in previous years regarding capacity and skills shortages in public servants, highlighting public sectors need for support to address challenges that have hindered the successful implementation of service delivery in South Africa. The National Treasury Instruction No.3 of 2019/2020 issued on the 01st October 2019 gave effect to the implementation of the FIDPM and reinforces governments initiatives towards improving the implementation of service delivery in the country. The FIDPM establishes governance for infrastructure delivery and procurement in the public sector and was seen as a key framework which focuses on governance and decision-making points as

well as alignment and functions to support the management of infrastructure delivery and procurement processes and further recognises project management as a strategic tool for infrastructure delivery. The implementation of the FIDPM directly impacts and influences the performance outcomes of the public sectors targets for service delivery.

PM Tools and Techniques

Experience indicated that the selection of the project manager is an important appointment which can influence the success or failure of the project. The implementation of effective project management to achieve successful project outcomes involves the selection and application of important project management tools and techniques. In addition, there are significantly strong relationship between project success and the leadership competencies of the project managers. Empirical evidence identified in the literature supported a positive relationship in project management practices and project success, which implied that project management practices and standards inherently increase prospects of project success. The use of project management tools and techniques remains imperative and relevant in today's changing environment. The main driver behind the application of project management in government is to improve public sectors ability to deliver efficient, effective and high-quality services. Project management was identified to support the achievement of institutional goals as well as provide greater assurance to stake holders that resources can be effectively managed.

Contribution to the Body of Knowledge

The outcomes recorded in this study add to the body of knowledge on an important service delivery framework that is in its infancy of implementation in South Africa. This research established a link between the factors that drive service delivery (namely, the public sector, government policies, frameworks and the FIDPM and project management tools and techniques) and the South African government to assist in effectively implementing the FIDPM towards improved service delivery on public sector construction projects. This was achieved through the development of a conceptual model based on the literature, thereafter conducting an iterative Delphi study and finally analysing the data of the survey questionnaire.

The research further highlighted the integration between the drivers in a practical and significant way through the research findings from the literature review, conceptual model, Delphi study, survey questionnaires and model fit validation that portrayed the relationship between the FIDPM, the challenges hindering its implementation and improving the delivery of public sector construction projects.

This study emphasised the importance of government ensuring that skilled, capacitated, and competent public servants are within the states employ. Efficient public servants will allow government to address

recurring problems at the root cause that are still evident in the public sector. In addition, policy development and implementation can then be aligned towards service delivery targets and enable government to effectively implement the principles and benefits the IDMS offers through the implementation of the FIDPM. Government must consider rigorously engaging the services of professional and experienced project managers to utilise PM tools and techniques to assist government with the implementation of the FIPDM towards improving service delivery in South Africa.

This study allowed a rich and valuable contribution to the academic body of knowledge as outcomes of performance were captured and reported on as they occurred, specifically during the covid-19 global pandemic.

10.3 Research Question, Aims and Objectives

The key research question that guided the study was identified as:

How will the drivers that signify the development of a model assist the South African government effectively implement the FIDPM towards improved service delivery?

The research then established empirically the factors (such as the public sector, government policies, frameworks and the FIDPM and project management tools and techniques) that drive service delivery as part of a model to assist the South African government effectively implement the FIDPM towards improved service delivery on public sector projects. In addition, the research objectives to achieve the theoretical and empirical objectives were:

10.3.1 Theoretical objectives

1. An in-depth analysis and discussion of the current body of knowledge was conducted under the following key sections:
 - The public sector in the built environment and construction industry,
 - Service delivery challenges and its related impacts,
 - Government policies, frameworks and the FIDPM, and
 - Project Management in the Built Environment.

2. Through the in-depth literature review, three key drivers, namely, (1) the public sector, (2) government policies, frameworks and the FIDPM and (3) project management tools and techniques were identified and collectively included 19 unobserved variables with 160 indicators. These were used to develop the proposed improved service delivery conceptual model to effectively assist improve service delivery in the South African public sector.

3. An iterative Delphi study was conducted which entailed a panel of 16 experts from which only 14 experts participated in rounds one, two and three after which consensus was achieved in the third round. The Delphi study validated the survey questionnaire and determined the factors to be tested as drivers for improved service delivery in the public sector.

10.3.2 Empirical Objectives

4. The structural model was tested and validated for a perfect fit. The research instrument was validated through content validity. This was achieved through the Delphi study which validated the content of the research instrument. Thereafter, the research instrument was further validated by a pilot study involving experienced built environment professionals. Finally, construct validity was achieved through validating the constructs by conducting the exploratory factor analysis and confirmatory factor analysis.

Once the exploratory factor analysis was implemented, confirmatory factor analysis was conducted to validate the hypothesised factors. Thereafter structural equation modelling was executed to create and analyse the model in Amos (version 26). The model was created by using factor extraction by Maximum Likelihood with Promax Rotation after the exploratory factor analysis was run using SPSS version 27.

5. The hypothesised path between the drivers and dependent variables in the model were assessed for practicality and significance. The conceptual model for this study was developed on 22 hypothesised relationships within three leading drivers, (1) the public sector, (2) government policies, frameworks and the FIDPM and (3) project management tools and techniques. Out of a total of 22 tested hypotheses, eight were accepted (36.36%) and 14 could not be rejected.

10.4 Recommendations

10.4.1 Recommendations to the Public Sector

Identified as a key component of the country's economy the South African public sector plays a critical role in economic growth and development. However, public sector inefficiencies such as incompetent public servants, a lack of accountability, poor human resources practices, inadequate procurement practices and a lack of leadership are hindering service delivery. As a result, inefficiencies in the public sector have led to service delivery challenges, poor management of finances, high levels of unemployment, nepotism including corruption.

Service delivery challenges in South Africa are underpinned by three primary areas of influence, namely, political issues, policy issues and implementation issues. Service delivery challenges have

further led to the development of policies and frameworks to address these challenges. To date, there are still unresolved challenges.

Therefore, the outcomes of this study recommend that government should through capacity building, focus on ensuring skilled and competent public servants at all levels are within the states employ. This will enable government to address recurring problems at the root cause that are still evident in the public sector. Align public service transformation strategies and improve the implementation of government service delivery initiatives. Enhance the implementation of Batho Pele principles and eventually reduce the ever-present service delivery challenges, Strengthen the implementation of government processes and decision making towards progressing service delivery and finally, align management strategies for service delivery to international best practice requirements.

10.4.2 Recommendation for government policies, frameworks and the FIDPM

Government has through the years developed and implemented numerous policies and frameworks to facilitate service delivery in the construction industry. To date, there are still unresolved challenges. Service delivery through the public sector in line with policy is instrumental towards ensuring countries developmental goals are achieved. However, government while good at policy development and understands the policy direction intent, are less successful during policy implementation. Government through National Treasury released the FIDPM towards ensuring a systematic approach for successful delivery of public sector construction projects. Since its implementation in 2019, the framework has not seen the improvement of public service delivery, emphasising that further intervention is required.

As a result of the outcomes of this study it is recommended that government address the lack of capacity building and focusing on ensuring skilled and competent public servants at all levels are within the states employ, policy development and implementation can be aligned towards successful service delivery. Government may start the process of effective policy implementation on public sector projects. Supply chain management may be used as intended, a strategic tool for public procurement. Lastly, government should start to effectively implement the principles and benefits the IDMS offers through the implementation of the FIDPM.

10.4.3 Recommendations to PMs

The construction industry suffers from public service skills shortages that affect the capacity of the industry and the public sector clients in terms of project delivery. PMs have been identified as key impact players to assist government address service delivery challenges. The main driver behind the application of construction project management in government is to improve state institution's ability to deliver efficient, effective and high-quality services. In addition, the FIDPM recognises that project

management plays a critical role in the delivery of public services in South Africa. PMs are therefore in a strong position to utilise the IDM toolkits principal and benefits through the implementation of the FIDPM towards improving service delivery on public sector projects.

It is recommended that government needs to rigorously engage the services of professional construction project managers to improve capacity building and focus on ensuring skilled and competent public servants at all levels are within the states employ are able to: utilise PM attributes to assist government with the implementation of the FIPDM towards improving service delivery. Implement effective change towards assisting government improve service delivery on public sector projects. Use key skill sets of effective project managers to assist government improve service delivery on public sector projects. Implement their skills under the ten knowledge areas of expertise to assist government address service delivery challenges. Assist government in achieving key institutional goals and apply the IDM toolkits principals in order to achieve the benefits through the FIDPM. Finally help government implement the IDM toolkits principals and benefits during seven FIDPM work stages ensuring all round implementation of the FIDPM towards achieving systematic and structured service delivery goals on public sector project.

10.4.4 Recommendations for Further Research

The following areas are recommended for future study:

- A similar study may be conducted after the FIDPM has had enough time for implementation in the industry in order to measure its performance against the identified drivers in comparison to this study, specifically after the economy has recovered from the impacts of covid-19.
- The role of other built environment professionals can play towards facilitating the improved implementation of the FIDPM may be considered for future studies.
- A similar study may be conducted on the other provinces in South Africa to obtain comparisons against the provinces included in this study.
- A study may be conducted on the null hypotheses from the 14 hypothesis that could not be rejected. Such as, *“a positive relationship is predicted between Management Strategies for Service Delivery and the public sector”* or *“a positive relationship is predicted between Key Institutional Goals and PM tools and techniques”*.

10.5 Summary

This study investigated a government framework that is fairly new in its implementation and made a rich and valuable contribution to the existing body of knowledge. The research proposed a model that government may utilise to assist with improving the implementation of the FIDPM through the use of PMs. This chapter summarised the key research findings, drew conclusions and made recommendations for future studies.

REFERENCES

- Acevedo, G.L., Rivera, K., Lima, L. & Hwang, H. (2010), Challenges in monitoring and evaluation: an opportunity to institutionalize M&E systems. Washington, DC: The International Bank for Reconstruction and Development/The World Bank.
- Adler, M. & Ziglio, E. (1996). Gazing into the oracle: The Delphi Method and its application to social policy and public health. London: Jessica Kingsley Publishers.
- African National Congress (2012), Decisive and sustained action to build a National Democratic Society.
- Aibinu, A. A., & Jagboro, G. O. (2002). The effects of construction delays on project delivery in Nigerian construction industry. *International Journal of Project Management*, 20(8), 593-599. [https://doi.org/10.1016/S0263-7863\(02\)00028-5](https://doi.org/10.1016/S0263-7863(02)00028-5)
- Ahsan, K & Gunawan, I (2010), Analysis of cost and schedule performance of international development projects, *International Journal of Project Management*, 28(1): 68-78.
- Akinboade, O. A., Mokwena, M. P., & Kinfack, E. C. (2013), Understanding citizens' participation in service delivery protests in South Africa's Sedibeng district municipality. *International Journal of Social Economics*, 40(5), 458–478. <http://dx.doi.org/10.1108/03068291311315331>
- Akintoye, A. (2016), Developing Theoretical and Conceptual Frameworks, [Online], Available: <http://Jedm.oauife.edu.ng/uploads> [March 2020]
- Akintoye, A. and Fitzgerald, E. (2000), A survey of current cost estimating practices in the UK, *Construction Managements and Economics*, 18(2): 161-172.
- Aigbavboa, C.O., Aghimien, D.O., Thwala, W.D. and Ngozwana, M.N. (2021), Unprepared industry meet pandemic: COVID-19 and the South Africa construction industry, *Journal of Engineering, Design and Technology*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/JEDT-02-2021-0079>
- Alexander, P. (2010), Rebellion of the poor: South Africa's service delivery protests – A preliminary analysis, *Review of African Political Economy* 37(123), 25–40.
- Alexander, P., Runciman, C., Ngwane, T., Moloto, B., Mokgele, K. & van Staden, N. (2018). Frequency and turmoil: South Africa's community protests 2005-2017, *SA crime quarterly*, 63, 27-42. Retrieved November 10, 2018
- Ali, A. S., Kamaruzzaman, S. N., Sulaiman, R., & Peng, Y. C. (2010). Factors affecting housing maintenance cost in Malaysia. *Journal of Facilities Management*, 8(4), 285-298. <http://dx.doi.org/10.1108/14725961011078990>
- Altman, M. (2008), Formal-Informal Economy Linkages. Pretoria: Human Science Research Council (HSRC).

- Ambe, I. M. (2016), Public procurement trends and public procurement trends and developments in South Africa, *Research Journal of Business and Management* 3(4), 277–290.
- Ambe, I. M. and Badenhorst-weiss, J. A., (2012), Procurement Challenges in the South African Public Sector, *Journal of Transport and Supply Chain Management* 242- 261, 2012.
- APM PMBOK, (2019), Association for Project Management – Project Management Body of Knowledge, 7th Ed, Association for Project Management, Ibis house, Regent Park, Summerleys Road, Princes Risborough, Buckinghamshire.
- APSDPR, (2012), Africa’s Public Service Delivery and Performance Review, Independent Service Delivery Monitoring Networks (ISDMN), ISBN 978-0-620-54598-3
- Artto, K.A. (2001), Management of project-oriented organization – conceptual analysis, Helsinki: Project Management Association. p. 5-22.
- Arrowsmith, S. (2010), Public procurement: Basic concepts and the coverage of procurement rules, in Public procurement relations: an introduction, EU Asia InterUniversity Network.
- Asnawi, A. L., Gravell, A. M. & Wils, B. (2012), Factor Analysis: Investigating Important Aspects for Agile Adoption in Malaysia, DOI 10.1109/Agile India, pp. 60-63.
- Assaf, S.A. and Al-hejji, S. (2006), Causes of Delay in Large Construction Projects, *International Journal of Project Management*, 24(7), 349-357.
- Australian Department of Finance and Administration, (2000), Client Service Charter Principles, Australian department of finance and administration.
- Ayee, J. R. A. (2008). Reforming the African public sector: Restrospect and prospects. Dakar: Council for the Development of Social Science Research in Africa.
- Avella, J. R. (2016): Delphi panels: Research design, procedures, advantages, and challenges. *International Journal of Doctoral Studies*, 11(1), 305-321.
- Bajpai, S. R., and Bajpai, R. C. (2014), Goodness of Measurement: Realibility and Validity, *International Journal of Medical Science and Public Health*, 3 (2), 112-115.
- Baldwin, A., & Trinkle, B. (2011). The impact of XBRL: A Delphi investigation. *International Journal of Digital Accounting Research*, 11, 1-24.
- Baloyi, L., & Bekker, M. (2011). Causes of construction cost and time overruns: The 2010 FIFA World Cup stadia in South Africa. *ActaStructilia*, 18(1), 51-67.
- Baron, J. (2003). Myside bias in thinking about abortion, University of Pennsylvania Press, Philadelphia.
- Bartuska T. J., (2007), The Built Environment: Definition and Scope, John Wiley & Sons Inc.

- Bartuska, T.J and McClure, W.R (2007), The Built Environment; A Collaborative Inquiry into Design and Planning, 2nd Edition, John Wiley & Sons Inc.
- Batho Pele Policy Review, (2003), Batho Pele Policy Review: Final Report and Recommendations, Job Mokgoro Consulting cc, September 2003.
- Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J. and Esquivel, S. L. (2013), Practical considerations for using exploratory factor analysis in educational research, Pract. Assess. Res. Eval. 18, 1
- Beiske, B. (2007), Research Methods: Uses and limitations of questionnaires, interviews and case studies, Munich: GRIN Verlag.
- Bell, E., Bryman, A., and Harley, B. (2019), Business research methods, 5th edition. United Kingdom: Oxford University Press. ISBN: 9780192545909
- Bell, J. (2005) Doing Your Research Project (4th edn). Buckingham: Open University Press.
- Bennis, W., (1997), Learning to Lead, Addison-Wesley, MA.
- Beukes, W. (2014), 48 service delivery protests so far this year. News24. Retrieved from <http://www.news24.com/SouthAfrica/News/48-service-delivery-protests-so-far-this-year-20140403>
- Bhuiyan, S. H., & Amagoh, F. (2011), Public sector reform in Kazakhstan: Issues and perspectives. International Journal of Public Sector Management, 24(3), 227–249.
- Björk, L., Szücs, S., & Härenstam, A. (2014). Measuring capacity to perform across local government services – managers’ perceptions. International Journal of Public Sector Management, 27(1), 26–38.
- Bjarnason, T., and Jonsson, S. H. (2005). Contrast effects in perceived risk of substance use. Subst Use Misuse, 40 (1), 1733–1748.
- Blanca, M.J., Alarcon, R., Arnua, J., Bono, R. & Bendayan, R. (2017), Non-normal data: Is ANOVA still a valid option? Psicothema, 29(4), 552-557.
- Bleijenbergh, I., Korzilius, H., and Verschuren, P. (2011): Methodological criteria for the internal validity and utility of practice oriented research. Quality & Quantity, 45(1), 145–156.
- Blum, J., Manning, N. & Srivastava, V. (2012), Public sector management reform: toward a problem-solving approach. Retrieved from <http://siteresources.worldbank.org/EXTPREMNET/Resources/EP100.pdf>
- Bolton, P. (2006), Government procurement as a policy tool in South Africa, Journal of Public Procurement 6(3):193–217.

- Bolton, P. (2007), The law of Government Procurement in South Africa, LexisNexis: Butterworth, Durban.
- Bradley, L., & Stewart, K. (2003). A Delphi study of Internet banking. Marketing Intelligence and Planning, 21(5), 272-281.
- Breakfast, N., Bradshaw, G. & Nomarwayi, T., (2019), 'Violent service delivery protests in post-apartheid South Africa, 1994–2017-a conflict resolution perspective', *African Journal of Public Affairs* 11(1), 106–126
- Broad Based Black Economic Empowerment Act 53 of 2003, Government Gazette, January 2004, The Republic of South Africa.
- Brown, T. A. (2015), Confirmatory Factor Analysis for Applied Research, 2nd ed. Guilford Publications, New York, NY.
- Bryman, A., & Bell, E. (2011), Business Research Methods, (3rd ed.) Oxford: Oxford University Press.
- Burke, R. (2013), Project Management Planning & Control Techniques, 3rd Edition, Burke Publishing.
- Burke, R. (2019), Project Management Techniques, 5th Edition, Burke Publishing.
- Burger, J., (2009), The reason behind service delivery protests in South Africa. Pretoria: Institute for Security Studies.
- Burrell, G. and Morgan, G. (2016), Sociological Paradigms and Organisational Analysis. Abingdon: Routledge (originally published by Heinemann 1979).
- Cain, M.K., Zhang, Z. & Yuan, K. (2017), Univariate and multivariate skewness and kurtosis for measuring nonnormality: Prevalence, influence and estimation, *Behav Res*, 49, 1716–1735.
- EFA and CFA*
- Cane, P. (2004), Administrative law, 4th edition. London: Oxford University Press.
- Chan, APC and Ada, PL (2004), Key Performance Indicators for Measuring Construction Success. "Benchmarking: An International Journal", 11(2), pp. 203-221.
- Charles J. and Kibert, J. (1999), Reshaping the Built Environment: Ecology, Ethics, and Economics, Island Press.
- Chin, W. (1998). The partial least squares approach for structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research*. Mahwah, NJ: Lawrence Erlbaum Associates, 295-336.
- CIC, (2020), Project Work Stages, Construction Industry Council, [Online], Available: <http://cic.org.uk/projectworkstages> [August 2020]

- CIDB Building and Construction Sector Report (2017), Results of the 2014 Survey of the CIDB Construction Indicators Report, December 2017.
- Civil Engineering Terms, (2020), Project Players of the Construction Industry, [On Line], Available: <https://www.civilengineeringterms.com/civil-engineering-practice/project-players-of-the-construction-industry/> [22 February 2020]
- Chan, APC and Ada, PL (2004), Key Performance Indicators for Measuring Construction Success. “Benchmarking: An International Journal”, 11(2), pp. 203-221.
- Charlton, S. (2008), Inequality and economic marginalisation: the state of land use management in South Africa. Paper for Urban LandMark. October 2008.
- Chen, L., Dean, J., Frant and Kumar, R. (2014). What Does “Service Delivery ” Really Mean?, World Policy Blog. [On Line], Available: <http://www.worldpolicy.org/blog/2014/05/13/what-does-service-deliveryreally-mean> [29 February 2020]
- Chinomona, R. and Omoruyi, O. (2015), The influence of Perceived Hypermarket Size on Perceived Hypermarket Reputation, Trust and Customer Willingness to Purchase in South Africa, Journal of Economics and Behavioral Studies (ISSN: 2220-6140) Vol. 7, No. 4, pp. 60-70, August 2015.
- Chin, W. W. (2010). How to write up and report PLS analyses. In: V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), Handbook of partial least squares: Concepts, methods and applications (Springer Handbooks of Computational Statistics Series, Vol. II, pp. 655–690). Heidelberg/Dordrecht/London/New York: Springer.
- Chipkin, I and Lipietz, B (2012), Transforming South Africa’s racial bureaucracy: New Public Management and public sector reform in contemporary South Africa, PARI, No1.
- Clark and Wilson, (2008), Role of the Consultant in Construction, [On Line], Available: www.cwilson.com [24 February 2019]
- Cleland, D.I. and Ireland, L.R. (2002), Project management, New York: Library of Congress Cataloguing in Publishing Data.
- Clapper, V. (2007), Efforts at Collaboration Between Public Administration Academics and Practitioners, Service Delivery Review 6(1): 36–39.
- COIB, (2014), Code of Practice for Project Management for Construction and Development, 5th Edition, published by The Chartered Institute of Building, John Wiley & Sons, Ltd.
- Collis, J. and Hussey, R. (2014), Business Research: a practical guide for undergraduate & post graduate students, 4th edition, Palgrave Macmillan.
- Conner, N. W., Roberts, T. G., & Harder, A. (2013). Competencies and experiences needed by entry level international agricultural development practitioners. Journal of International Agricultural and Extension Education, 20(1), 19 – 32.

- Considine, M. (1994), Public Policy: A Critical Approach. South Melbourne: Macmillan Education.
- Construction Industry Development Board Act 2000, Government Gazette, November 2000, The Republic of South Africa.
- Cooper, D. R. and Schindler, P. S. (2009), Business Research Methods (10th ed.). New York: McGraw-Hill.
- Council for the Built Environment Act No.43 of 2000, Government Gazette, The Republic of South Africa, Cape Town, 01 December 2000
- Creswell, J.W. and Poth, C.N. (2018) Qualitative Inquiry and Research Design Choosing among Five Approaches. 4th Edition, SAGE Publications, Inc., Thousand Oaks.
- Custer, R., Scarcella, J., & Stewart, B. (1999). The modified Delphi technique—a rotational modification. Journal of Vocational and Technical Education, 15(2), 1-10.
- Currstine, T. (2005). Government performance: Lessons and challenges. OECD Journal on Budgeting, 5(1), 127–151.
- Cross, C. (2010), Shack settlements as entry to the labour market: Towards testing upgrading paradigms, Urban Landmark Conference: Rethinking emerging land markets in rapidly growing southern African cities, 1–2 November 2010, Johannesburg, South Africa.
- Cross, C. (2014), Youth, housing and urban location: economic entry for the excluded poor. Johannesburg: SACN
- Crous, M. (2004), Service delivery in the South African public service: Implementation of the Batho Pele Principles by Statistics South Africa, Journal of Public Administration, 39(4.1), 574-589.
- Davey, J. and Gatenby, A. (2017), The Government Procurement Law Review, The Law Reviews, Edition 5, May 2017.
- Davies, Nikolas and Jokiniemi, E., (2008), Dictionary of Architecture and Building Construction, Amsterdam, Elsevier Architectural Press, 2008 Print
- Dalkey, N. C. (2002). Toward a theory of group estimation. In H. A. Linstone & M. Turoff (Eds.), The Delphi method: Techniques and applications (pp. 231-256). Newark, NJ: New Jersey Institute of Technology
- Daniel, E., & White, A. (2005). The future of inter-organisational system linkages: Findings of an international Delphi study. European Journal of Information Systems, 14, 188-203.
- deBoer, J & Hale, J. (2002, November/December). The oracle at Delphi: Was she really stoned? Archaeology Odyssey, 6/2002.
- De Vaus, D. (2002), Surveys in social research, 5th edition, ed: Routledge.

- de Visser, J. (2009), Developmental local government in South Africa: institutional fault lines. Commonwealth Journal of Local Government 2: 7–25.
- De Haes, S., & Van Grembergen, W. (2009). An exploratory study into IT governance implementations and its impact on business/IT alignment. Information System Management, 26, 123-137.
- Delbecq, A. L., Van de Ven, A. H., & Gustafson, D. H. (1975). Group techniques for program planning: A guide to nominal group and Delphi processes. Glenview, Ill.: Scott, Foresman.
- Department of Public Service and Administration (DPSA), (2018), Annual Report 2017/ 2018, Batho Pele House, Pretoria
- Democracy, Governance and Service Delivery (DGSD) Programme (2016), South African Social Attitudes Survey (SASAS), Human Sciences Research Council Pretorius Street, Pretoria, May 2016
- Dlamini, S. (2012), Relationship of construction sector to economic growth. Paper presented at the International Congress on Construction Management, Canada.
- de Villiers, M., de Villiers, P., & Kent, A. (2005). The Delphi technique in health sciences education re-search. Medical Teacher, 27(7),
- Didiza, T. (2008), Sustainable development through leadership building, Address by the Minister of Public Works on the occasion of the South African Women of Construction summit.
- Donohoe, H. M. and Needham, R. D. (2009): Moving best practice forward: Delphi characteristics, advantages, potential problems, and solutions. International Journal of Tourism Research, 11(5), 415–437.
- Donohoe, H., Stelfson, M., and Tennant, B. (2012): Advantages and limitations of the e-Delphi technique: Implications for health education researchers. American Journal of Health Education, 43(1), 38–46.
- Dooley, K. E. (2007). Viewing agricultural education research through a qualitative lens. Journal of Agricultural Education, 48(4), 32-42.
- Drost, E. A. (2011), Validity and reliability in social science research, Education and Research Perspectives, 38 (1), 105-124.
- Durdyev, S. and Ismail, S. (2012), Role of the construction industry in economic development of Turkmenistan, Energy Education Science and Technology Part A: Energy Science and Research 2012, volume 29 (2), 883 – 809.
- Du Toit, D., Knipe, A., van Niekerk, D., van der Waldt, G. and Doyle, M. (2002). Service Excellence in Government. Sandown: Heinemann.
- Easterby-Smith, M., Thorpe, R. Jackson, P. and Lowe, A. (2008), Management Research (3rd ed.). Sage: London.

- Eaton, P., Frank, B., Johnson, K. and Willoughby, S. (2019), Comparing exploratory factor models of the Brief Electricity and Magnetism Assessment and the Conceptual Survey of Electricity and Magnetism, Physical Review Physics Education Research 15, 020133, Published by the American Physical Society.
- Egbu, C O & Robinson, H S (2005), Construction as a knowledge-based industry. In: Anumba, C J, Egbu, C O & Carrillo, P M (Eds), Knowledge Management in Construction, Oxford: Blackwell.
- Eldridge, S. M., Lancaster, G. A., Campbell, M. J., Thabane, L., Hopewell, S., Coleman, C. L., & Bond, C. M. (2016). Defining feasibility and pilot studies in preparation for randomised controlled trials: Development of a conceptual framework. PLoS One, 11(3).
- Emuze and Smallwood (2013), Management Concepts and Project Performance: Perceptions from the South African Public Sector Environment, Journal of the South African Institution of Civil Engineering, Vol.55, Midrand, January 2013.
- Emuze, F A & Smallwood, J J (2011), Construction industry development: A South African perspective, Proceedings, 2011 CIB-W107 - International Conference on Construction in Developing Countries, 1-3 November, Hanoi, Vietnam, pp 109-113.
- Endut, I. R., Akintoye, A., & Kelly, J. (2009). Cost and time overruns of projects in Malaysia. Retrieved on August, 21, 243-252.
- Eyaa, S. & Oluka, P.N. (2011), Explaining noncompliance in public procurement in Uganda, International Journal of Business and Social Science. 2(11), June 2011.
- Fakir, E. (2014). Service delivery protests. Mail & Guardian. Retrieved from <http://mg.co.za/tag/service-delivery-protests>
- Faridi, A.S. and El-sayegh, S.M. (2006) Significant Factors Causing Delay in the UAE Construction Industry, Journal of Construction Management and Economics, 24, 1167-1176.
- Field, A. (2005), Discovering Statistics Using SPSS, (2nd ed). London: Sage.
- Fellows, R. and Liu, A. (2008), Impact of participants values on construction sustainability, Engineering Sustainability, 161(4): 219-227.
- Fellow, R. F. and Liu, A. M. M., (2015), Research Methods for Construction, John Wiley & Sons, July 2015.
- Finch, W. H. (2020), Exploratory Factor Analysis, Quantitative Applications in the Social Sciences, Sage Publications, ISBN: 9781544339887.
- FIDPM (2019), Framework for Infrastructure Delivery and Procurement Management, National Treasury, October 2019

- Fitzgerald, P, and Hodgson, S (2017), Governance and the client as leader of the infrastructure delivery process. Short course on Infrastructure Procurement and Delivery Management, School of Construction Economics and Management, University of the Witwatersrand, 29 August 2017.
- Financial and Fiscal Commission (2017), Responding to South Africa's Infrastructure Challenges, Submission for the 2016/2017 Division of Revenue, online, [available]: <http://www.ffc.co.za/2-uncategorised/157-submission-for-the-2018-2019-division-of-revenue>, 23/03/2019
- Finke, A. (2010) Conducting Research Literature Reviews: From the Internet to Paper (third edition). London: Sage.
- Fink-Hafner, D., Dagen, T., Dousak, M., Novak, M. and Hafner-Fink, M., (2019), Delphi Method: Strengths and Weaknesses, Metodoloski zvezki, Vol. 16, No.2, 2019, 1-19.
- Field, A. (2000), Discovering Statistics using SPSS for Windows. London – Thousand Oaks – New Delhi: Sage publications
- Fleetwood, S. (2005), Ontology in organization and management studies: A critical realist perspective, Organization, Vol. 12, pp. 197–222.
- Flick, U. (2011), Introducing research methodology: A beginner's guide to doing a research project. London: Sage.
- Francis, H.J. (2013). Restoring public confidence in the public sector. Accountancy SA, September:28–30.
- Franks, P. (2014), The Crisis of the South African Public Service, The Journal of the Helen Suzman Foundation, Issue 74, November 2014.
- Fraser, J., Fahlman, D., Arscott, J. and Guillot, I. (2018), Pilot Testing for Feasibility in a Study of Student Retention and Attrition in Online Graduate Programs, International Review of Research in Open Distributed Learning, Vol. 19, Number 1.
- Frost, J. (2020), Regression Analysis: An Intuitive Guide for Using and Interpreting Linear Models, Statistics by Jim Publishing, October 2020.
- Foley, K. J. (2005). Meta management. Melbourne: Standards Australia.
- Fourie, D. (2014), The role of Public Sector Enterprises in the South African Economy, Journal of Public Affairs, Volume 7 Number 1, March 2014
- Fourie, D. and Poggenpoel, W. (2016), Public sector inefficiencies: Are we addressing the root causes? South African Journal of Accounting Research, 31:3, 169-180.
- Frimpong, Y., Oluwoye, J. and Crawford, L. (2003), Causes of Delay and Cost Overruns in Construction of Groundwater Projects in a Developing Countries: Ghana as a Case Study, International Journal of Project Management, 21, 321- 326

- Freund, B. (2010), Is there such a thing as a post-apartheid city? Urban Forum, 21, pp. 283–298.
- Gabel-Shemueli, R., & Capell, B. (2013). Public sector values: Between the real and the ideal. Cross Cultural Management, 20(4), 586–606.
- Gaskin, J., James, M., and Lim, J. (2019), "Master Validity Tool", AMOS Plugin. Gaskination's StatWiki.
- Gaskell, J. D. (2015), The Complete Guide to Consultant Engineering, How to Start & Manage an Outstanding Consulting Engineering Practice, Published by Professional Value Books, January 2015.
- Gaur, A. S. and Gaur, S. S. (2009), Statistical Methods for Practice Research: A Guide to Data Analysis Using SPSS, Sage Publications Pvt. Ltd.
- Geist, M. R. (2010). Using the Delphi method to engage stakeholders: A comparison of two studies. Evaluation and Program Planning, 33(2), 147-154
- Geoghegan, L. and Dulewicz, V. (2008), Do project managers leadership competencies contribute to project success, Project Management Journal, Vol 39, Issue 4, Pages 58-67.
- Ghobadian, A., Viney, H., & Redwood, J. (2009). Explaining the unintended consequences of public sector reform. Management Decision, 47(10), 1514–1535.
- Giannarou, L. & Zervus, E. (2014), Using Delphi technique to build consensus in practice, Int. Journal of Business Science and Applied Management, Volume 9, Issue 2, 2014.
- Gildenhuys, J.S.H. (1997), Introduction to the Management of Public Finance: A South African Perspective, Pretoria: J.L. van Schaik.
- Gill, J., Johnson, P. & Clark, M. (2010), Research Methods for Managers, SAGE Publications.
- Gillham, B. (2000). Case Study Research Methods. London: Bill Gillham.
- Girmscheid, G & Hartmann, A (2002), The interdependence of procurement strategies and organizational culture: From the perspective of innovation, In T M Lewis (Ed), Procurement Systems and Technology Transfer, St Augustine, Trinidad and Tobago: The University of the West Indies, pp 371-82.
- Gjologaj, V. (2015). Developing a sports club management competency model for Albania: A Delphi study. (Doctoral Dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3621740).
- Goodman C.M. (1987) The Delphi technique: a critique. Journal of Advanced Nursing 12, 729-734.
- Google Images, (2020), Inadequate Access to School for Learners KwaZulu-Natal, South Africa.

- Google Images, (2020), Informal Settlements and Chemical Toilets due to lack of Services in the Western Cape, South Africa.
- Google Images, (2020), Violent Service Delivery Protest in KwaZulu-Natal, South Africa.
- Gomme, G.L., (1987), Lectures on the principles of the local government, delivered at London school of Economics, Lent term 1987, Westminster, Whitehall garden. PP 1-2.
- Gouverneur, D. (2014), Planning and Design for Future Informal Settlements. Shaping the Self-constructed City. London and New York: Routledge.
- Grant, C. & Osanloo, A., (2014), Understanding, Selecting, and Integrating a Theoretical Framework in Dissertation Research: Creating the Blueprint for 'House', Administrative Issues Journal: Connecting Education, Practice and Research, Pp. 12-22 DOI: 10.5929/2014.4.2.9
- Grime, M. M & Wright, G. (2016), Delphi Method, University of Strathclyde Business School, Glasgow, John Wiley & Sons, Ltd 2014-2016.
- Group Areas Act (1966), Group Areas Act, Act No.3 of 1966
National Treasury (2020)
- Gulati, PM, (2009), Research Management: Fundamental and Applied Research, Global India Publications, p.42
- Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2018), Advanced issues in partial least squares structural equation modeling (PLS-SEM), Thousand Oaks: Sage.
- Hanks, J., Davies, H. & Perera, O. (2008), Sustainable Public Procurement in South Africa, Online Available: www.iisd.org Accessed [30 May 2019]
- Handfield, R.B., Monczka, R.M., Guinipero, L.C. & Patterson, J.L. (2011), Sourcing and supply chain management, USA, 5th ed. South-Western Cengage Learning.
- Hallowell, M. and Gambatese, J. A. (2010), Qualitative Research: Application of the Delphi Study Method to CEM Research, Journal of Construction Engineering and Management, 136(1), ASCE.
- Harder, A., Place, N. T., & Scheer, S. D. (2010). Towards a competency-based extension education curriculum: A Delphi study. Journal of Agricultural Education, 51(3), 44–52.
- Hayden M., Levy J. and Thompson, J. (2007), The Sage Handbook of Research in International Education, Sage Publication Ltd.
- Heath, L., and Tindale, R. S. (1994). Applications of heuristics and biases to social issues, Plenum, New York.
- Hejblum, G., Ioos, V., Vibert, J., Böelle, P., Chalumeau-Lemoine, C., Chouaid, C., Valleron, A., & Guidet, B. (2008). A web-based Delphi study on the indications of chest radiographs for patients in ICUs. Chest Journal, 133(5)

- Hill K.Q. & Fowles J. (1975) The methodological worth of the Delphi forecasting technique. Technological Forecasting and Social Change 7, 193±194.
- Hillebrandt, P.M. (2000), Economic Theory and the Construction Industry. Basingstoke, UK: Macmillan.
- Hoffman, P. (2010), Kader Asmal calls for the scrapping of the National Democratic Revolution, The Institute for Accountability in Southern Africa
- Holey, E.A., Feeley, J.L., Dixon, J. & Whittaker, V.J. (2007). An exploration of the use of simple statistics to measure consensus and stability in Delphi studies. BMC medical research methodology, 7(52):1-10.
- Hobbs, B. (1993), Organizational choices for project management, New York: Amacom. p. 163-167.
- Hox, J. J. and Bechger, T. M. (1999), An Introduction to Structural Equation Modelling, Family Science Review, 11, 354-373.
- Holt, L. (1989), Project management excellence: The shell stanney case, Construction Management and Economics, 7(3), 217–234.
- Hsu, C. C. and Sandford, B. A. (2007): The Delphi technique: Making sense of consensus. Practical Assessment, Research & Evaluation, 12(10), 1–8.
- Hutcheson, G. D., and Sofroniou, N. (1999), The Multivariate Social Scientist: an introduction to generalized linear models. Sage Publications.
- Hulin, C., Netemeyer, R., and Cudeck, R. (2001), Can a Reliability Coefficient Be Too High? Journal of Consumer Psychology, Vol. 10: 1, 55-58.
- Human Sciences Research Council, 2016, Democracy, governance and Service Delivery (DGSD) Programme, Human Sciences Research Council, Pretorius Street, Pretoria
- Ika, L.A. (2009), Project success as a topic in project management journals, Project Management Journal, Vol 40, Issue 4, Pages 6-19, December 2009.
- Infrastructure Delivery Management System (IDMS) (2014), Provincial Infrastructure Delivery Management System Framework Contract, Infrastructure Framework for the Health and Education Sectors, 2-4 June 2014 Revision.
- Infrastructure Delivery Management System (IDMS) (2019), Pilot Roll Out in Selected Municipalities Through Stakeholder Engagement and Training, Training Module A0: Executive Overview, Participants Module, Municipal Infrastructure Support Agent, March 2019.
- Institute of Internal Auditors, (2011), Supplemental Guidance: Public Sector Definition, The Institute of Internal Auditors Global, 247 Maitlan Ave Altamonte Springs, December 2011

- International Institute for Sustainable Development Report, (2014), Implementing Sustainable Public Procurement in South Africa: Where to start, Published by the International Institute for Sustainable Development, Canada.
- Ip, S. and Hanson, O. C. (2012), Understanding the Role of the Consultant – An Update on the Consultant’s Legal Responsibilities, BCBEC Conference and AGM, 26th September 2012.
- Iqbal, S. and Pippon-Young, L. (2009): The Delphi method. Nursing Research, 46(2), 116–118.
- Jarrar, Y., & Schiuma, G. (2007). Measuring performance in the public sector: Challenges and trends. Measuring Business Excellence, 11(4), 4–8.
- Janse van Rensburg, J. O. (2014), Internal audit capability: a public sector case study. Unpublished M. Com. Dissertation. University of Pretoria: Pretoria.
- Janudin, S. E., & Maelah, R. (2016), Performance measurement system in Malaysian public research universities: Is it contemporary? International Journal of Management in Education, 10(3), 219-233.
- Jeong, C. H. (2003), Principles of public administration. Shah Alam: Pusat Penerbitan Universiti, Universiti Teknologi MARA
- Jeppesen R. (2010), Accountability in public procurement – transparency and the role of civil society. United Nations Procurement Capacity Development Centre. [Online]. Available at www.unpcdc.org (accessed June 2020).
- Jonker, J. and Pennink, B. (2010), The Essence of Research Methodology, DOI 10.1007/978-3-540-71659-4_4, # Springer-Verlag Berlin Heidelberg 2010
- Jsakaluk, (2016), CFA: negative factor loadings, URL (version: 2016-06-24): <https://stats.stackexchange.com/q/220418>, (<https://stats.stackexchange.com/users/53456/jsakaluk>)
- Kaming, P. F., Olomolaiye, P. O., Holt, G. D. and Harris, F. C. (1997), Factors Influencing Construction Time and Cost Overruns on High-Rise Projects in Indonesia, Construction Management and Economics, Vol. 15, 83-94.
- Kanyane, M.H (2014), Exploring municipal service delivery in South Africa (1994-2012), Africa’s Public Service Delivery and Performance Review, Vol.2, Issue 1 (88-107).
- Kaiser, H. (1974), An index of factorial simplicity. Psychometrika, 39, 31-6.
- Kaul, M (1998), Introducing New Approaches: Improved Public Service Delivery, Managing the Public Services Strategies for Improvement, Series: No.5, Commonwealth Secretariat, London
- Keil, M., Tiwana, A., & Bush, A. A. (2002). Reconciling user and project manager perceptions of IT project risk: A Delphi study. Information Systems Journal, 12, 103-119.

- Kervin, L. (2004), Action research as a professional development model for the teaching of writing in early stage one/ stage one classrooms, PhD thesis, Faculty of Education University of Wollongong, 2004.
- Ketokivi, M. and Mantere, S. (2010), Two Strategies for Inductive Reasoning in Organisational Research, Psychology, Academy of Management Review 35(2): 315-333.
- Kerzner, H. (2009), Project Management A System Approach to Planning, Scheduling and Controlling, 10th Ed, John Wiley & Sons, Inc.
- Kerzner, H. (2019), Using the Project Management Model: Strategic Planning for Project Management, 3rd Edition Wiley 2019.
- Khumalo, G., Ntlokonkulu, L., and Rapoo, T., (2003), Alternative service delivery arrangements at municipal level in South Africa: Assessing the impact of electricity service delivery and customer satisfaction in Johannesburg. (ISS Research Report 100). Pretoria: Institute for Security Studies.
- Kotze, J.S. & Taylor, D., (2010), 'Ke nako: service delivery as a key challenge for the Zuma administration: a developmental local government perspective', *Africa Insight* 40(3), 198–212.
- Kitchen, H. (2004), Financing Local Government Capital Investment, International Seminar on Local Public Finance and Governance, Dali, China.
- Kivunja, C. and Kuyini, A. B. (2017), Understanding and Applying Research Paradigms in Educational Contexts, Sciedu Press, International Journal of Higher Education, Vol.6 No.5: 2017.
- Kirchberger, M (2018), The role of the construction sector, Trinity College Dublin, Dublin, Ireland, UNU-WIDER 2018.
- Kikwasi, G. J., & Escalante, C. (2018). Role of the construction sector and key bottlenecks to supply response in Tanzania, (9292565737)
- Kline, R.B. (2016), Principles and Practice of Structural Equation Modeling. 4th edition, Guilford Press, New York
- Knipe, A., Van der Walt, G., Van Niekerk, D., Burger, D., and Nell, K. (2016), Project Management for Success, Heinemann Publishers (Pty) Ltd, South Africa
- Kothari, C. R. (2020), Research Methodology Methods & Techniques, 4th Edition, New Age international (P) Limited Publishers.
- Kumar, R. (2019), Research Methodology: a step-by-step guide for beginners, 5th Edition, Sage Publications Ltd
- Larson, E. (2004), Project management structures, New Jersey: Wiley.
- Lane, J. E. (2000), The Public Sector: Concepts, Models and Approaches, 3rd Edition, Sage Publications, 2000.

- Lang, T. (1994). An overview of four future methodologies, The Manoa Journal of Fried and Half-fried ideas (about the future). Retrieved from <http://www.webcitation.org/5UYpp5NFf>
- Larson, E. W. and Gray, C. F. (2011), Project Management: The Managerial Process, 5th Edition, Published by McGraw-Hill/Irwin, New York, 2011.
- Laryea, S. and Watermeyer R (2018), Comparison of two infrastructure project implementation models in a developing country. Proceedings of the Institution of Civil Engineers, Management, Procurement and Law 171 Issue 1 February, pp 3–17.
- Lawless, A. (2007), Numbers & needs in local government: Addressing civil engineering - The critical profession for service delivery, Midrand: SAICE.
- Lee, R.M. (1993), Doing Research on Sensitive Topic. London: Sage.
- Leedy, P. D. and Ormrod, J. (2009), Practical Research: Planning and Design (9th ed.). Harlow: Pearson.
- Lilja, K., Laakso, K., & Palomaki, J. (2011), Using the Delphi method. In Proceedings of PICMET '11.
- Linstone, H. A., & Turoff, M. (Eds.). (2002). The Delphi method: Techniques and applications. Retrieved from <http://is.njit.edu/pubs/delphibook/delphibook.pdf>
- Lincoln Y.S. & Guba E.G. (1985) Naturalistic Inquiry. Sage, London.
- Linstone, H. A., & Turoff, M. (2002). The Delphi method: Techniques and applications. Newark, NJ: New Jersey Institute of Technology.
- Lim, C. and Mohamed, M. (2000), An exploratory study into recurring construction problems, International Journal of Project Management, 18, pp. 267–273.
- Linna, P., Pekkola, S., Ukko, J., & Melkas, H. (2010), Defining and measuring productivity in the public sector: Managerial perceptions, International Journal of Public Sector Management, 23 (5), 479–499.
- Long, D. N, Ogunlana, S. O., Quang, T. and Lam, K. C. (2004), Large construction projects in developing countries: a case study from Vietnam, International Journal of Project Management, 22, 553-61.
- Loo, R. and Thorpe, K. (2002), Using reflective learning journals to improve individual and team performance, Team Performance Management 8(5/6):134-139.
- Lopes, J. (2011). Construction in the economy and its role in socio-economic development. In G. Ofori (ed.). New Perspectives on Construction in Developing Countries. Abingdon, UK: Spon Press, 40–71.
- Lufunyo, H. (2013). Impact of public sector reforms on service delivery in Tanzania. Journal of Public Administration and Policy Research, 5(2), 26–49.

- Luyt, D. (2008), Media and Advocacy Head of the Public Service Accountability Monitor (PSAM), at the Monitor (PSAM), Paper Presented at the United Nations Social Forum on 2 September 2008 in Geneva, Switzerland.
- Luse, A., Mennecke, B., & Townsend, A. (2012), Selecting a Research Topic: A Framework for Doctoral Students, *International Journal of Doctoral Studies*, 7, 143-152.
- MacDonald, S. and Headman, N. (2009), Research Methods Handbook Introductory guide to research methods for social science research, Centre for Local Economic Strategies.
- Machi, L. A., McEvoy, T. B. and Press, C. (2018), The literature review: six steps to success, Thousand Oaks, Corwin, 2018.
- Magd, H. A. E. (2006), An investigation of ISO 9000 adoption in Saudi Arabia, *Managerial Auditing Journal*, 21(2)
- Malhotra N. K., Dash S. (2011), Marketing Research an Applied Orientation, London: Pearson Publishing.
- Managa, A. (2012). Unfulfilled promises and their consequences: A Reflection on Local Government Performance and the Critical issue of Poor Service Delivery in South Africa. Africa Institute of South Africa: Policy Brief No.76. Pretoria: AISA.
- Mashamaite, K. (2014), Public Service Delivery Protests in a Democratic South Africa: A Dilemma for Local Municipalities, *Mediterranean Journal of Social Sciences*, Vol 5, No.25 pgs 231-237
- Management Study Guide, MSG, (2017), Performance management, process and system, [Online], Available: <http://www.managementstudyguide.com/performance-management.htm> (March 2020)
- Martin, W. (2006). Theories of judgment, University Press, New York.
- Martino, J. P. (1985). Looking ahead with confidence. *IEEE-Spectrum*, 22(3), 76-81.
- Madzivhandila, T.S. & Asha, A.A. (2012), Integrated development process and service delivery challenges for South Africa's local municipalities, *Journal of Public Administration*, 47(1.1), 369-378
- Matebesi, S. & Botes, L., (2017), Party identification and service delivery protests in the Eastern Cape and Northern Cape, South Africa, *African Sociological Review/Revue Africaine de Sociologie* 21(2), 81–99.
- Masiya, T., Davids, Yul D. and Mangai, M. S. (2019), Assessing Service Delivery: Public Perception of Municipal Service Delivery in South Africa, *Theoretical and Empirical Research in Urban Management*, Vol 14, Issue 2, May 2019.

- Manyathi, S., Burger, A.P.J. & Moritmer, N.L. (2021), Public sector procurement: A private sector procurement perspective for improved service delivery, *Africa's Public Service Delivery and Performance Review* 9(1), a521.
- Marshall, A. (1965), Financial administration of Local Government, George Allen & Unwin, London. PP 1-5.
- Mahajan, S. (2014), Economics of South African Townships: Special Focus on Diepsloot. World Bank Studies. Washington, DC: World Bank.
- Managa, A. (2012), Unfulfilled promises and their consequences: A Reflection on Local Government Performance and the Critical issue of Poor Service Delivery in South Africa, Africa Institute of South Africa: Policy Brief No.76. Pretoria: AISA.
- McKinsey and Company. (2017), The art of project leadership: Delivering the world's largest projects, McKinsey Capital Projects and Infrastructure Practice. September 2017.
- McKenna, H. (1994). The Delphi technique: A worthwhile research approach for nursing? *Journal of advanced nursing*, 19(6):1221-1225.
- Mcbride, V. and Reinecke, I. (2012), Writing good governance frameworks: A how-to guide, Clayton Utz, [Online], Available: <https://www.claytonutz.com/knowledge/2012/april/writing-good-governance-frameworks-a-how-to-guide> March 2020.
- McKenna, H. (1994), The Delphi technique: A worthwhile research approach for nursing? *Journal of advanced nursing*, 19(6):1221-1225.
- McKenna, H., Keeney, S. and Hasson, F. (2011), The Delphi Technique in Nursing and Health Research, John Wiley & Sons, Inc.
- McNeill, P. (1995), Research Methods, 2nd ed., Routledge, New York.
- McCarthy, N.G. (2006), Report of the Auditor-General, Free State, Bloemfontein, 30 June:1–7.
- Mathee, C.A. (2006), The potential of internal audit to enhance supply chain management Outcomes, Master's dissertation, University of Stellenbosch, Stellenbosch.
- Mahlaba, P.J. (2004), Fraud and corruption in the Public Sector: An audit perspective. *S D R*, 3(2):84–87.
- Melnyk, S. A., Lummus, R. R., Vokurka, R. J., Burns, L. J., and Sandor, J. (2009): Mapping the future of supply chain management: A Delphi study. *International Journal of Production Research*, 47(16), 4629–4653.
- Merrifield, A. (1999), 4 The role of the construction industry in the delivery of infrastructure in South Africa, Research Gate.
- Mfene, P.N., 2013, 'Public accountability: A professional basis for the South African public service', *Administratio Publica* 21(1), 6–23.

- Mihaiu, D. M., Opreana, A., & Cristescu, M. P. (2010). Efficiency, effectiveness and performance of the public sector. *Romanian Journal of Economic Forecasting*, 4(1), 132–147
- Mindrila, D., Zhu, M. & DiStefano, C. (2009), Understanding and using factor scores: considerations for the applied researcher, *Practical Assessment, Research & Evaluation*, Vol 14, No 20, pp.1-11.
- Mishra, S. B and Alok, S. (2017), Handbook of Research Methodology, A Compendium for Scholars and Researchers, Educreation Publishing.
- Migiro, S.O. and Ambe, I.M. (2008), Evaluation of the implementation of public sector supply chain management and challenges: a case study of the central district municipality, North West province, South Africa. *African Journal of Business Management*, 2(12):230–42.
- Mishra P, Pandey CM, Singh U, Gupta A, Sahu C, Keshri A. (2019), Descriptive statistics and normality tests for statistical data. *Ann Card Anaesth* 2019; 22: 67-72.
- Moe, C. E., & Päivärinta, T. (2013). Challenges in Information Systems procurement in the public sector. *Electronic Journal of E-Government*, 11(2), 308–323.
- Montgomery, C. (2013), Happy City: Transforming Our Lives Through Urban Design. New York: Farrar, Straus and Giroux.
- Moore, S.T. (1992), How useful is “bureaucracy? A review essay, *Political research quarterly*, 45:1049-1065.
- Mogale, T.M., 2003, ‘Developmental local government and decentralised service delivery in the democratic South Africa’, in G. Mhone & O. Edigheji (eds.), *Governance in the new South Africa*, pp. 215–243, UCT Press, Lansdowne.
- Mosombuka, S. (2011), Most councils fail audit test. Times Live [online] Available at <http://www.timeslive.co.za/thetimes/2011/06/30/most-councils-fail-auditest> [Accessed 10 March 2020].
- Morudu, H. D. (2017), Service protests in South African Municipalities: An Exploration using Principal Component Regression and 2013 Data, [Online], Available: <https://www.tandfonline.com/doi/full/10.1080/23311886.2017.1329106?src=recsys> May 2019.
- Montiel, P. J. (2011). On macroeconomic reforms and macroeconomic resiliency: Lessons from the Great Recession. *Modern Economy*, 2(4), 528–537.
- Muir, T. and Rance, B. (1995), Collaborative Practice in the Built Environment, Routledge.
- Mukherjee, A, Hoare, D and Hoare, J (2002), Selection of research methodology for PhD researchers working with an organization. In: Greenwood, D (Ed.), 18th Annual ARCOM Conference, 2-4 September 2002, University of Northumbria. Association of Researchers in Construction Management, Vol. 2, 667-76.

- Muller, M. (2010), Setting apartheid in concrete: Lessons from the Moloto Road, The Thinker, 12, pp. 18–20.
- Municipal Finance Management Act No.56 of 2003, Government Gazette 30271, September 2007, The Republic of South Africa.
- Muthien, Y. (2013), Public Service Reform in SA: Key Challenges of Execution, Strategic Review for Southern Africa, Vol 36, No.2.
- Muthien, Y (2013), Public Service Reform in SA: Key Challenges of Execution, Making National Development Work: From Design to Delivery, Stellenbosch Business School, Bellville, 21-22 November.
- National Planning Commission (2011), National Development Plan, Pretoria: The Presidency.
- National Treasury, (2003), Policy strategy to guide uniformity in procurement reforms processes in government, Republic of South Africa.
- National Treasury, (2019), National Treasury Instruction No.03 of 2019/2020, Framework for Infrastructure Delivery and Procurement Management, Republic of South Africa, 2019.
- National Treasury, (2015), Public Sector Defined, National Treasury, Republic of South Africa, 2015.
- National Treasury, (2004), Supply Chain Management Guide for Accounting Officers/Authorities, National Treasury, Republic of South Africa, 2004
- National Treasury, (2016), Supply Chain Management Review Update 2016, National Treasury, Republic of South Africa, 2016
- National Treasury Regulations (2005), National Treasury, March 2005, The Republic of South Africa.
- Nengwakhulu, R.H. (2009), Public service delivery challenges facing the South African public service, Journal of Public Administration, 44(2), 341-363.
- Ngubane, Y.P. (2013), Effectiveness of the Performance Management and Development System at the South African Social Security Agency, University of KwaZulu-Natal, South Africa: Kwazulu-Natal province.
- Ngcamu, B. S. (2019), Exploring service delivery protests in post apartheid South African municipalities: A literature review, The Journal for Transdisciplinary Research in South Africa, Vol 15, No.1, AOSIS 2019.
- Odeyinka, H.A., Kelly, S. and Perera S. (2009). An Evaluation of the Budgetary Reliability of Bills of Quantities in Building Procurement. The construction and building research conference of the Royal Institution of Chartered Surveyors held at the University of Cape Town, pp 435-446
- Odhiambo, W. & Kamau, P. (2003), Public procurement: Lessons from Kenya, Tanzania and Uganda, OECD Development Centre Working Paper No. 208.

- Office of Government of Commerce (OGC), (2005), Supply chain management in public sector procurement: a guide version, 6 June.
- Ofori, G. (2015), Nature of the Construction Industry, Its Needs and Its Development: A Review of Four Decades of Research, *Journal of Construction in Developing Countries*, 20 (02), 115 – 135, 2015.
- Okpala, D.C. and Aniekwu, A.N. (1988), Causes of High Costs of Construction in Nigeria. *Journal of Construction Engineering*, 114(2), 233-244.
- Ofori, G. (1990), The Construction Industry: Aspects of its Economics and Management. NUS Press.
- Ogunlana S. O., Prokuntong, K. and Jearkijrm, V. (1996), Construction Delays in Fast Growing Economy: Comparing Thailand with Other Economies, *International Journal of Project Management*, Elsevier, 14 (1), 37-45.
- Olawajaju, O. M. and Ibrahim, S. S. (2020), Construction Industry Performance and the Growth of South African Economy: Any Causal Relationship? *Test Engineering and Management*, Vol 8.3 Pg No.: 22508 – 22521, Publication Issue: May-June 2020
- Oliver, M. (2002). JISM special issue on theory for learning technologies: Editorial. *Journal of Interactive Multimedia Education*, 9. Art. 8. Retrieved from <https://jime.open.ac.uk/articles/10.5334/2002-9>
- Oppenheim, A.N. (2000) Questionnaire Design, Interviewing and Attitude Measurement (new edn). London: Continuum International.
- Orcan, F. (2020), Parametric or Non-parametric: Skewness to Test Normality for Mean Comparison, *Internal Journal of Assessment Tools in Education*, Vol.7, No.2, 255-265, 2020.
- Osborne, D. and Gaebler, T. 1992, Reinventing the Government: How the Entrepreneurial Spirit is Transforming the Public Sector, Addison Wesley Publishing Co. 1992.
- Pallant, J. (2020), SPSS Survival Manual: A step by step guide to data analysis using IBM SPSS, Taylor & Francis, Oxford, Australia
- Pandey P. and Pandey M.M, (2015), Research Methodology: Tools and Techniques, Bridge Center 2015.
- Papke-Shields, K.E. and Boyer-Wright, K.M, (2017), Strategic planning characteristics applied to project management, *International Journal of Project Management*, Vol 35, Issue 2, Pages 169-179, February 2017
- Passey, D. (2020), Theories, theoretical and conceptual frameworks, models and constructs: Limiting research outcomes through misconceptions and misunderstandings. *Studies in Technology Enhanced Learning*, 1(1)

- Petunia, T.A. & Selepe, M., (2020), Strengthening policy- and decision-making processes through community participation: A municipal perspective, Africa's Public Service Delivery and Performance Review 8(1), a409.
- Peters, B.G. (1996), The future of governance: four emerging models, Lawrence: Kansas University Press.
- Phillips, S (2018), The ongoing evolution of government infrastructure procurement. Civil Engineering, January / February 2018.
- PMBOK Guide, (2017), A Guide to the Project Management Body of Knowledge, 6th Edition, Project Management Institute.
- PMBOK Guide, (2021), A Guide to the Project Management Body of Knowledge, 7th Edition, Project Management Institute.
- PMI, (2017), A Guide to the Project Management Body of Knowledge, Project Management Institute, Newton Square, Pennsylvania.
- PMSA, (2020), Project Management South Africa, (Online) Available: <https://www.projectmanagement.org.za/page/Overview> [07 August 2020]
- Powell, C. (2003). The Delphi technique: Myths and realities. Journal of Advanced Nursing, 41(4), 376–382.
- Pollitt, C. & Bouckaert, G. (2000), Public management reform, Oxford: Oxford University Press.
- Prevention and Combatting of Corrupt Activities Act No.12 of 2004, Government Gazette, April 2004, The Republic of South Africa.
- Preferential Procurement Policy Framework Act No.5 of 2000, Preferential Procurement Regulation, 2001, The Republic of South Africa.
- Preferential Procurement Policy Framework Regulations Act 2000, National Treasury, January 2017, The Republic of South Africa.
- President Cyril Ramaphosa: 2018 State of the Nation Address, 16 February 2018.
- President Cyril Ramaphosa: 2020 State of the Nation Address, 13 February 2020.
- Presidential Review Commission (PRC), (1998), Developing a culture of good governance, PRC Pretoria
- PricewaterhouseCoopers, (2016), SA Construction: Highlighting Trends in the South African Construction Industry, 2nd Edition, PwC, November 2016.
- PRINCE2, (2017), Managing Successful Projects with PRINCE2, 6th Edition AXELOS Limited copyright 2017.

Promotion of Administrative Justice Act 3 of 2000, November 2000, The Republic of South Africa.

Provincial Treasury Bid Number: TREA/013/19/MP, (2019), Request for Service Providers to Assist and Support the Provincial Treasury in the Implementation of the Infrastructure Delivery Management System (IDMS) for a period of Three (3) Years, Mpumalanga Provincial Government, Provincial Treasury.

Public Finance Management Act No.1 of 1999, National Treasury, March 1999, The Republic of South Africa.

Public Service Commission (PSC), (2015), Annual Report for 2014/ 2015, Pretoria.

Public Service Commission (PSC) (2008), Assessment of the State of Human Resource Management in the Public Service, Pretoria.

Public Service Commission (PSC), (2014), Building a Capable, Career-Oriented and Professional Public Service to Underpin a Capable and Developmental State in South Africa, Conference Report, Pretoria.

Public Service Commission (PSC), (2005), Evaluation of Service Standards in the Public Service, Pretoria.

Public Service Commission (PSC), (2010), Evaluation of Service Standards in the Public Service, Pretoria.

Public Service Commission (PSC), (2018), Performance Management and Development System for the Public Service, Pretoria.

Public Service Commission Report (PSC) (2008), Report on the implementation of the Batho Pele principle of Openness and Transparency in the Public Service, 2008, The Republic of South Africa.

Public Service Commission (PSC), (2000), Survey of Compliance with the Batho Pele Policy, Pretoria.

Public Performance & Management Review, (2001), Vol. 24 No.4, June 2001, Sage Publications, Inc.

Public Service Act, (1994), Proclamation 103 published in GG 15791 of 03rd June 1994.

Public Service Commission of Canada, (2000), Overview of Recent Public Service Reforms in Canada, Britain, Australia, New-Zealand and the United States, prepared by the Research Directorate, Public Service Commission of Canada.

Quyen, Đ. T. N. (2014): Developing university governance indicators and their weighting system using a modified Delphi method. Procedia - Social and Behavioral Sciences, 141, 828–833.

Rayens, M.K. & Hahn, E.J. (2000). Building consensus using the policy Delphi method. Policy politics nursing practice, 1(2):308-315.

- Regulatory Framework for Supply Chain Management (2003), Gazette No. 25767, December 2003, The Republic of South Africa.
- Resnik, D.B., (2020), What is Ethics in Research & Why Is It Important, December 2020
- Renz, P.S. (2007), Project governance: implementing corporate governance and business ethics in non-profit organizations, Heidelberg: Physica.
- RIBA (2020), Royal Institute of British Architects, [Online], Available: <https://www.architecture.com/Explore/Home.aspx> [August 2020]
- Ridley, D. (2008), The Literature Review: A Step-by-Step Guide for Students. London: Sage.
- Rivera, R., Jr. (2013). Assessing community reintegration in adolescents and young adults with spinal cord injury: A Delphi study. (Doctoral Dissertation). Available from ProQuest Dissertations and Theses data base. (UMI No. 3574181).
- Robson, C. (2002), Real World Research, 2nd ed, Oxford: Blackwell.
- Robson, C. (2004), Real World Research, 2nd ed, Blackwell Publishing, Oxford.
- Robson, C. (2011), Real world research, (3rd ed.). Oxford, UK: Blackwell.
- Rottenstreich, Y., and Hsee, C. K. (2001). Money, kisses, and electric shocks: On the affective psychology of risk. Psychol. Sci., 12, 185–190.
- Rowe, G., & Wright, G. (2001). Expert opinions in forecasting: The role of the Delphi process. In J. S. Armstrong (Ed.), Principles of forecasting: A handbook for researchers and practitioners (pp. 125–144). Boston: Kluwer Academic Publishers.
- Rwelamila, P D & Jerling, W (2011), Construction risks generated by employers from the perspective of contractors: The case of South African contractors, Proceedings, 2011 CIB-W107 - International Conference on Construction in Developing Countries, 1-3 November, Hanoi Vietnam, pp 57-63
- SA Budget Review (2019), South African Budget Review, National Treasury, Republic of South Africa, 20th February 2019
- SACPCMP (Act No. 48 of 2000), South African Council for the Project and Construction Management Professions, Guideline Scope of Services and Recommended Guideline Tariff of Fees, Board Notice 168 of 2019, September 2019.
- Salehi, E. H and Ramirez, M. T. (2003), Institutions, Infrastructure, and Economic Growth, Journal of Development Economics 70: 417-58.
- Saunders, M., Lewis, P. and Thornhill, A. (2019), Research for Business Students, 8th Edition, Pearson Education Limited.

- Samuel, J., Motala, E. and Vally, S. (1980), African History and the Struggle to Decolonise Africa, Centre for Education Rights and Transformation, 1980
- Schiller, B. R. (1993), Essentials of economics. McGraw-Hill.
- Schumacker, R. E. and Lomax, R. G. (2016), A beginners guide to structural equation modelling, Routledge Taylor & Francis Group New York.
- Sambasivan, M. and Soon, Y.W. (2007), Causes and Effects of Delays in Malaysian Construction Industry, International Journal of Project Management, 25(5), 517-526.
- Schmidt, R., Lyytinen, K., Keil, M., and Cule, P. (2001): Identifying Software Project Risks: An International Delphi Study. Journal of Management Information Systems, 17(4), 5–36.
- Schwella, E. (2001), Public Sector Policy in the New South Africa: A Critical Review, Public Performance & Management Review, Vol. 24, No. 4 (June 2001), Published by Taylor and Francis, Ltd.
- Schwartz, R. D. (1971). Operational Techniques of a Factor Analysis Model. The American Statistician, 25(4), 38–42. <https://doi.org/10.2307/2682927>
- Sekaran, U., Bougie, R. (2017), Research Methods for Business: A Skill Building Approach, United Kingdom: John Wiley & Sons, Ltd, Publication.
- Schüssler, M. (2012), South Africa cannot afford South Africans, The 11TH UASA Employment Report
- Shah, A. (2005), Public Service Delivery, Public Sector Governance and Accountability Series, The World Bank.
- Shah, R. and Goldstein, S.M. (2006), Use of Structural Equation Modelling in Operations Management Research: Looking Back and Forward. Journal of Operations Management, 24, 148-169.
- Sharma, R. K. (2008), Social Methods and Techniques, Atlantic Publishers & distributors (P) Ltd
- Sheoraj, R. (2007), The state of skills readiness in the South Africa public service: an overview of provincial and local government, Master's thesis, University of Pretoria, South Africa
- Shinn, G. C., Wingenbach, G. J., Briers, G. E., Lindner, J. R., & Baker, M. (2009). Forecasting doctoral-level content in international agricultural and extension education–2010: Viewpoint of fifteen engaged scholars. Journal of International Agricultural and Extension Education, 16(1), 57–71.
- Sinclair-Smith K. and Turoks, I. (2011), The changing spatial economy of cities: An exploratory analysis of Cape Town, mimeo.
- Skinner, R., Nelson, R. R., Chin, W. W. and Land, L. (2015), The Delphi Method Research Strategy in Studies of Information Systems, Communications of the Association for Information Systems, Vol 37, Article 2.

- SIPDM (2016), National Treasury System for Infrastructure Procurement and Delivery Management System, Civilution, SAICE Block 19, Thornhill, Midrand February 2016
- Skulmosi, G. J, Hartman, F. T & Krahn, J. (2007), The Delphi Method for Graduate Research, Journal of Information Technology Education, Volume 6, 2007
- Sommerville, J & Craig, N (2006), Implementing IT in Construction, Oxford: Taylor & Francis.
- Soon-Shiong, N. (2018), Implementing Agents: The Middleman in Charge of Building Schools, Equal Education 2018.
- South African Cities Network, (2016), State of the South African Cities Report 2016, Johannesburg: SACN, Law Printing.
- South African Cities Network, (2018), The Peoples Guide to the State of City Finances 2018, Johannesburg: SACN, Law Printing.
- South African Government, (1997), Conference Report of the National Conference on Public Service Delivery, [Online], <https://www.gov.za/documents/conference-report-national-conference-public-service-delivery> November 2019.
- South African Government News Agency, (2017), Construction Sector Faces Many Challenges, Report Presented by Public Enterprises Minister, South African Government News Agency, [Online], Available: (<http://www.sanews.gov.za/south-africa/construction-sector-faces-many-challenges-gigaba>) February 2019.
- Soudry, O. (2007), A principal-agent analysis of accountability in public procurement, Boca Raton, FL: PrAcademics Press.
- Srivannaboon, S. and Milosevic, D.Z. (2006), A two-way influence between business strategy and project management, International journal of project management, 24(6): 493-505.
- Standard Industrial Classification, (1996), Construction Industry Definition, Sustainable Indicator Group, Working Draft Framework, Version 2.
- Statistics Act No.6 of 1999, Government Gazette, April 1999, The Republic of South Africa.
- Statistics South Africa, (2015), Non-financial census of municipalities, Report P9115, 30th June 2015. Pretoria: Statistics South Africa.
- Statistics South Africa, (2016), The state of basic service delivery in South Africa: In-depth analysis of the Community Survey 2016 data, Report 03-01-22. Pretoria: Statistics South Africa.
- Statistics South Africa (2018), Service Delivery Improvement Plan 2015/16 – 2017/18, Pretoria: Statistics South Africa.
- Statistics South Africa (2019), Service Delivery Improvement Plan 2018/19 – 2020/21, Pretoria: Statistics South Africa.

- Statistics Solutions (2021), Complete dissertation: expert guidance every step of the way. “Structural Equation Modelling”, <https://www.statisticssolutions.com/free-resources/directory-of-statistical-analyses/structural-equation-modeling/>. Accessed: 31 August 2021.
- Statistics South Africa (2021), GDP: Quantifying SA’s economic performance in 2020, Report March 2021, Pretoria: South Africa.
- Stren, R. (2014), Urban Service Delivery in Africa and the Role of International Assistance, Development Policy Review, Volume 32, Issue s1, 06 June 2014.
- Strassman, P. (1970). The construction sector in economic development. Scottish Journal of Political Economy, 17(3): 390–410.
- Sullivan, A. and Haris, F.C. (1986), Delays on Large Construction Projects, International Journal of Operations and Production Management, 6(1), 25-33.
- Supply Chain Management Review (2016),
- Sumsion, T (1998), The Delphi technique: an adaptive research tool. British Journal of Occupational Therapy, 61 (4), 153–56.
- Sutrisna, M. and Barrett, P. (2007), ‘Applying rich picture diagrams to model case studies of construction projects’, Engineering Construction and Architectural Management, 14(2), pp. 164-179.
- Szymanski, S. (2006), What is construction industry? An Economic Fact Book. The Harry Van Arsdale Jr. Centre for Labour Studies, New York, 2006.
- Tabachnick, B. G., and Fidell, L. S. (2019), Using Multivariate Statistics, 7th Edition, Pearson.
- Talbot, J. and Jakeman, M. (2008), SRMBOK: security risk management body of knowledge. Carlton South, Vic: Risk Management Institution of Australasia
- Tatum, C.B (1987), Innovation on the Construction Project: A process View. Project Management Journal, Vol. 18. No.5, December 1987.
- Taylor-Powell, E. and Renner, M. (2003), Analyzing Qualitative Data. Open Journal of Epidemiology, Vol.6 No.2
- Teddie, C. and Tashakkori, A. (2012), Common “Core” Characteristics of Mixed Methods Research: A review of critical issues and call for greater convergence, Volume: 56 issue: 6, page(s): 774-788
- The Republic of South Africa (2013), Auditor General Report RSA, 2011-12.
- The Reconstruction and Development Programme, (1994), A Policy Framework, The Republic of South Africa.
- Thiry, M. & Matthey, A. (2005), Delivering business benefits through projects, programs, portfolios and PMOs. Proceedings of PMI Global Congress, Singapore.

- The South African Constitution (Act No. 108 of 1996), Constitution of the Republic of South Africa, 10 December 1996, available at: <https://www.refworld.org/docid/3ae6b5de4.html> [24 June 2019]
- Thornhill, A., Saunders, M.N.K. and Stead, J. (1997), 'Downsizing, delaying but where's the commitment? The development of a diagnostic tool to help manage survivors', *Personnel Review*, Vol. 26, No. 1/2, pp. 81–98.
- The Citizen's Charter, (1991), The Citizen's Charter Raising the Standard, London July 1991.
- Toor, S.R., Ogunlana, S. and Ofori, G. (2012), Leadership and its development in construction in developing countries, Abingdon, UK: Spon Press, 242–268.
- Turin, D.A (1973), The Construction Industry: Its Economic Significance and Its Role in Development. London: University College Environmental Research Group (UCERG).
- Turner, J.R. and Keegan, A. (2001), Mechanisms of governance in the project-based organization: roles of the broker and steward, *European management journal*, 19(3):254-267
- Twala, C. (2017), The Causes and Socio-political Impact of the Service Delivery Protests to the South African Citizenry: A Real Public Discourse, [Online], Available: (<https://www.tandfonline.com/doi/abs/10.1080/09718923.2014.11893279?src=recsys>) May 2019.
- Ursachi, G., Horodnic, I.A., and Zait, A. (2015), How reliable are measurement scales? External factors with indirect influence on reliability estimators, *Procedia Economics and Finance*, Vol. 20: 679 – 686.
- Uphoff, E. P., Wennekes, L., Punt, C. J., Grol, R. P., Wollersheim, H. C., Hermens, R. P., and Ottevanger, P. B. (2012): Development of generic quality indicators for patient-centered cancer care by using a RAND modified Delphi method. *Cancer nursing*, 35(1), 29–37.
- Van der Waldt, G. (2007), Project Management: A New Service Delivery Paradigm, North West University South Africa, [Online], Available: <https://www.researchgate.net/publication/43656775> August 2019.
- Van der Waldt, G. (2004). Managing Performance in the Public Sector: Concepts, Considerations and Challenges. Lansdowne: Juta & Co. Ltd.
- Van Zyl, D.C. (2006), Strategic supply chain management by Matatiele Municipality, Master's dissertation, University of Stellenbosch, Stellenbosch.
- Vernon, W. (2009). A Delphi technique: A review. *International Journal of Therapy and Rehabilitation*, 16(2), 69-76.
- Visser, A., (2012), More state bodies failed audit tests, [online] Available at <http://www.businesslive.co.za/southafrica/2012/01/17/more-state-bodies-failed-audit-tests-nombembe> [Accessed 10 March 2020].
- Von der Gracht, H. A. (2012). Consensus measurement in Delphi studies—review and implications for future quality assurance. *Technological Forecasting and Social Change*, 79, 1525-1536.

- Walliman, N. (2017), Research Methods the Basics, Routledge Taylor & Francis Group, London and New York.
- Watermeyer, R. (2018), Client Guide for Improving Infrastructure Project Outcomes, First Edition, Published by the School of Construction Economics and Management, University of Witwaterstrand, Johannesburg, April 2018.
- Watkins, M.W. (2018). Exploratory Factor Analysis: A Guide to Best Practice. *Journal of Black Psychology*, Vol. 44(3) 219 –246. DOI: 10.1177/0095798418771807
- Williams, M. A. and Baker, W. L. (2010), Bias and error in using survey records for ponderosa pine landscape restoration, *Journal of Biogeography*, 37, 707-721.
- Weis, R. (1996), Policy Definition and Classification: Aspects, Criteria, and Examples, IFIP/ IEEE International Workshop on Distributed Systems: Operations & Management, Toulouse, France, October 1994
- Weiss, A. (2009), Getting Started in Consulting, 3rd Edition, Published by John Wiley & Sons, Inc, New Jersey, Published Simultaneously in Canada.
- White Paper on Transforming Public Service Delivery (1999), Department of Public Service and Administration, September 1997, The Republic of South Africa.
- Williams, M. A. and Baker, W. L. (2010), Bias and error in using survey records for ponderosa pine landscape restoration, *Journal of Biogeography*, 37, 707-721.
- Wilson, J. (2010), Essentials of business research: a guide to doing your research project, SAGE Publication.
- Wilson, M. (2012), A new integrated and holistic approach to service delivery planning, *Service Delivery Review*, 9(2), 26-29.
- Wilson, S., Hauck, Y., Bremner, A., and Finn, J. (2012): Quality nursing care in Australian paediatric hospitals: A Delphi approach to identifying indicators. *Journal of Clinical Nursing*, 21(11-12), 1594–1605.
- Williams, J. (2000), Urban transformation, *Cities* Vol. 17(3): 167–183.
- Wibowo, A. (2009), The contribution of the construction industry to the economy of Indonesia: A systematic approach, Semarang: Diponegoro University.
- Wilkinson, P. (2008), Reframing urban passenger transport as a strategic priority for developmental local government. Cape Town: UCT Press, pp. 203–221.
- Worrell, J. L., Di Gangi, P. M., & Bush, A. A. (2013). Exploring the use of the Delphi method in accounting information systems research. *International Journal of Accounting Information Systems*, 14, 193- 208.

- World Bank (1994), World Development Report 1994, Washington, DC, World Bank.
- World Bank Report (2015), Public Service Delivery, Online Available: <https://www.worldbank.org/en/topic/governance/brief/public-service-delivery-global-solutions-group> Accessed [29 February 2020]
- World Bank (2021), The World Bank in South Africa, Online Available: <https://www.worldbank.org/en/country/southafrica/overview#1> [Accessed: March 2021].
- World Health Organization. (2020), Coronavirus disease 2019 (COVID-19): situation report, 30, World Health Organization. <https://apps.who.int/iris/handle/10665/331119>
- World Economic Forum (2016). Shaping the Future of Construction: A Breakthrough in Mindset and Technology. World Economic Forum. May 2016.
- Wynaden, D., Heslop, K., Omari, O., Nelson, D., Osmond, B., Taylor, M., & Gee, T. (2014). Identifying mental health nursing research priorities: A Delphi study. Contemporary Nurse, 47(1-2), 16-26. ISSN: 1037-6178
- Yang, X., Zeng, L., & Zhang, R. (February 2012). Cloud Delphi method. International Journal of Uncertainty, Fuzziness & Knowledge-Based Systems, 20/1, 77-97.
- Yousef, M. I. (2007), Using experts' opinions through Delphi technique. Practical Assessment Research & Evaluation, 12(4).
- Yin, R. K. (2003), Case study research: Design and methods. Thousand Oaks, Calif: Sage Publications.
- Zikmund, (2002), Business research methods, Dryden, Thomson Learning
- Zvavahera, P. (2014), An evaluation of the effectiveness of performance management systems on service delivery in the Zimbabwean civil service, Journal of Management and Marketing Research, 14, 1.

APPENDIX A - UZKN ETHICAL CLEARANCE LETTER

26 January 2021

Mr Neil Sirbadhoo (204509335)
School Of Engineering
Howard College

Dear Mr Sirbadhoo,

Protocol reference number: HSSREC/00002333/2021

Project title: An examination of the Framework for Infrastructure delivery and Procurement Management and its implementation in South African Public Sector Projects: The Construction Project Managers Perspective.

Degree: PhD

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 16 November 2020 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. **PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.**

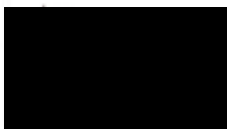
This approval is valid until 26 January 2022.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

All research conducted during the COVID-19 period must adhere to the national and UKZN guidelines.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,








Professor Dipane Hlalele (Chair)

/dd

Humanities and Social Sciences Research Ethics Committee

Postal Address: Private Bag X54001, Durban, 4000, South Africa

Telephone: +27 (0)31 260 8350/4557/3587 Email: hssrec@ukzn.ac.za Website: <http://research.ukzn.ac.za/Research-Ethics>

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville