CHALLENGES FACED BY THE INDEPENDENT DEVELOPMENT TRUST IN SUPPORTING THE KWAZULU-NATAL PROVINCIAL GOVERNMENT'S INFRASTRUCTURE DELIVERY

BY

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SUPERVISOR'S PERMISSION TO SUBMIT DISSERTATION FOR EXAMINATION

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DECLARATION

I, Mlungisi Jimmy Khumalo, do hereby declare that this study on “The Challenges faced by the IDT in Supporting the KZN Provincial Government’s Infrastructure Delivery” contains my own work except where specifically acknowledged.

This dissertation is the result of my investigation and research and it has not been submitted in part or full for any degree or to any other University.

I further declare that all sources of information referenced have been acknowledged by means of complete references.

I also declare that this report has never been submitted to any other institution of higher learning, for any degree.

Lastly, this study represents my own opinions and not necessarily those of the University of KwaZulu-Natal (UKZN).

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Date……..

DEDICATION

I dedicate this study to my late parents, Mr Bongani Thembinkosi Khumalo and Mrs Lindeni Mavis Khumalo. Mom and Dad, you have given me the best in my childhood life teachings in general. I believe that cemented a foundation of who I am and it is what kept me standing firm all these years.

I have always tried to make you proud and will always praise you for that. That is what has always propelled me to go that extra mile in life.

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ABSTRACT

This research was set to investigate the major factors accounting for the challenges faced by Independent Development Trust (IDT) in the infrastructure delivery of the provincial government of KwaZulu-Natal. The research looked mainly at the root causes of delays and budgetary overruns and the resultant effect on service delivery back-logs and the socio-economic impact caused by such delays. The study was conducted on professional stakeholders in the built environment. These included specialists and professionals in the engineering, construction management, civil and general building fields. The objectives of this study were achieved by means of a questionnaire that was distributed to a group of participants, composed of project managers, quantity surveyors, engineers, architects and project managers working with IDT. The nature of the research was quantitative and the data analysis used was descriptive with a few inferential statistics to arrive at some generalisations and conclusions. This study was able to affirm that there are major inefficiencies in the current infrastructure delivery model of the South African government. The major causes identified included factors such as delays in payments, poor planning, subsiding levels of professional ethics and standards exercised by professionals in the built environment. The study has also made some recommendations from the research findings. Clearly the infrastructure delivery model requires a new trajectory in tackling under-development and the triple challenges of poverty, unemployment and slow economic growth.

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LIST OF ABBREVIATIONS

BBBEEA	Broad-Based Black Economic Empowerment
BPS	Bond Points Spread
CIDB	Construction Industry Development Board
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IDMS	Infrastructure Delivery Management System
IDT	Independent Development Trust
JBCC	Joint Building Construction Committee
KZN	KwaZulu-Natal
MDG	Millennium Development Goals
MTEF	Medium Term Expenditure Framework
NDP	National Development Plan
PFMA	Public Finance Management Act
PPPFA	Preferential Procurement Policy Framework Act
PROCSA	Professional Service Agreements South Africa
SA	South Africa
SARB	South African Reserve Bank
WEF	World Economic Forum

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1. CHAPTER ONE: INTRODUCTION

1.1 SOUTH AFRICAN ECONOMIC OUTLOOK

The roots of government failures or successes lie in the economic policies and decisions around the appropriate economic mix and on how best the government is able to yield optimal output. It has been argued that the intervention of the government should be able to address market failures (Schiller and Hill, 1993).

Gross Domestic Product (GPD) is arguably one of most used measures of economic growth, defined as the sum of goods and services produced within the borders of nations. Central to the GDP calculator is the government spending on government services, consumer goods, investment goods and net exports (Schiller and Hill, 1993).

Like in many economies, South African (SA) government has put infrastructure spending at the centre of its economic growth strategy. With limited resources and slow economic growth, it is critical that the government takes stock of how each rand and cent is accounted for, including prudent fiscal discipline (Zuma, 2013).

Figure 1.1 (below) reflects SA GDP fluctuations over the past eight years:

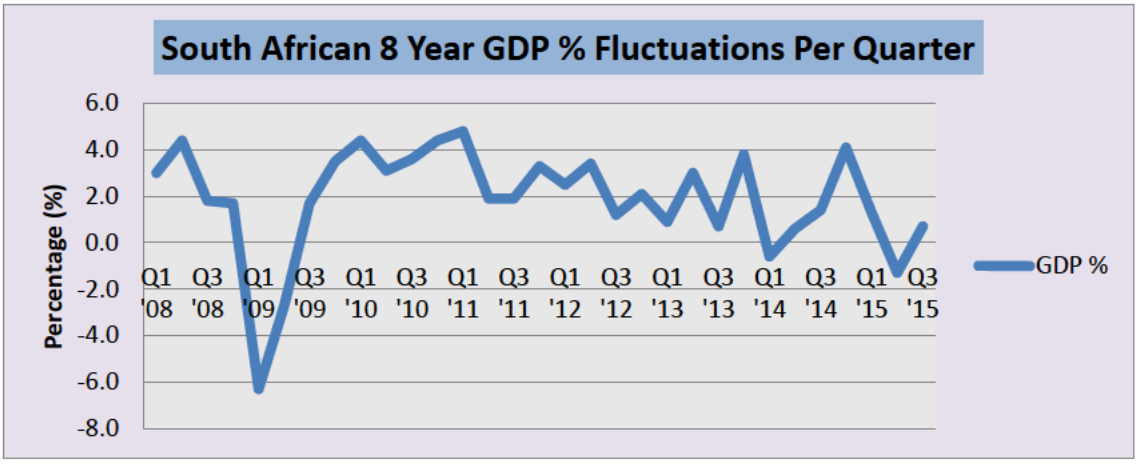


Figure 1.1: Graphical depiction of the 8 year South African GDP trends

Adapted from Statistics South Africa, Economic Indicators (Statistics SA, 2015)

The graph was drawn from the GDP figures for South Africa, from Statistics South Africa. These trends or fluctuations are shown in Table 1.1 below. Noteworthy is that the table mirrors what is presented by Figure 1.1 (above) and it clearly indicates that the South African GDP has never reached a 5% growth over the past 8 years. The 5% annual growth target set out in the National Development Plan (NDP) is unattainable, judging by the past 8 years of GDP performance (since 2008/09 period) (Statistics SA, 2015). Furthermore, it implies that all the targets of employment creation that are dependent on the 5% growth may not be achieved in the short to medium term period. Also, unless the economy rids itself of the vestiges of structural economic challenges, 5% growth will not be achieved.

Table 1.1: South African GDP Fluctuations

Id	Period	GDP %	Id	Period	GDP %	Id	Period	GDP %	Id	Period	GDP %
1	Q1 '08	3.0	**5**	Q1 '09	-6.3	**9**	Q1 '10	4.4	**13**	Q1 '11	4.8
2	Q2 '08	4.4	**6**	Q2 '09	-2.7	**10**	Q2 '10	3.1	**14**	Q2 '11	1.9
3	Q3 '08	1.8	**7**	Q3 '09	1.7	**11**	Q3 '10	3.6	**15**	Q3 '11	1.9
4	Q4 '08	1.7	**8**	Q4 '09	3.5	**12**	Q4 '10	4.4	**16**	Q4 '11	3.3
Id	**Period**	**GDP %**	**Id**	**Period**	**GDP %**	**Id**	**Period**	**GDP %**	**Id**	**Period**	**GDP %**
17	Q1 '12	2.5	**21**	Q1 '13	0.9	**25**	Q1 '14	-0.6	**29**	Q1 '15	1.3
18	Q2 '12	3.4	**22**	Q2 '13	3.0	**26**	Q2 '14	0.6	**30**	Q2 '15	-1.3
19	Q3 '12	1.2	**23**	Q3 '13	0.7	**27**	Q3 '14	1.4	**31**	Q3 '15	0.7
20	Q4 '12	2.1	**24**	Q4 '13	3.8	**28**	Q4 '14	4.1			

Adapted from National and Provincial Labour Market: Youth: Q1: 2008–Q3: 2015 (Statistics SA, 2015).

Being in the global landscape, SA has had to catch up with speed, in dealing with the issues of under-development, unemployment, poor economic growth, poverty and inequality. Some measures have been adopted, include setting targets in the Millennium Development Goals (MDG) and the National Development Plan (NDP) Vision 2030 (MDG, 2015). The NDP underscored the immense levels of poverty, inequality and unemployment.

According to the South African Reserve Bank (SARB) there has been poor growth and sluggish net investment income, in terms of Foreign Direct Investment (FDI)

which decreased by R13,3bn in 2014. As a result of the poor global economy, the moderate pace of growth and other domestic factors, the budget deficit increased to 5,3% in 2012/13. This had been the trend since 2008/09, prompting the government to introduce a tighter fiscal stance (South African Reserve Bank, 2014).

SA has managed to keep inflation within the targeted range of between 3% and 6%, by a narrow margin over a five year period ending 2014, recording an average of 5,48%. The SA economy has suffered severely from the high premiums paid for borrowings in terms of the Bond Points Spread (BPS), registering 223 basis points above international benchmarks, according to JP Morgan Emerging Markets Index (National Planning Commission, 2013).

In terms of the competitive outlook, the global competitiveness rankings of the World Economic Forum indicate that SA has been regressing gradually from 2007/08 to 2015, moving from position 44 to 58 in 2014/15 amongst 144 countries in the world. The International Institute for Management Development ranked South Africa at the 52nd position amongst 60 countries in competitiveness. Factors taken into consideration for assessing competitiveness are skills, industrial relations, efficiencies and reduced levels in broader economic performance (National Planning Commission, 2013, 2014).

According to the 2012 Knowledge Assessment Methodology (KAM) report of the World Bank which was a ranking of countries from bad to worse, based on scores of respective variables in the Knowledge Economy Index (KEI), South Africa continued to regress in terms of the Knowledge Economic Index. This is arguably understandable in SA's historic perspective, which was previously a resource-based economy and then has had to transform with speed towards a knowledge-based economy, in the wake of low global demand for mineral resources (Chen and Dahlman, 2005).

In accordance with the KAM Report, emerging or middle income countries such as SA could flourish if these countries could strengthen their human resources, especially skills and innovation, and optimise the use of information and

communication technologies. Amongst other countries in the same category, notably are Brazil, Mexico, Mauritius, Malaysia, Romania, Chile and Poland (Chen and Dahlman, 2005).

As a preamble to the NDP, the plan cites amongst central challenges, the infrastructure that is poorly located and under-maintained, rendering it insufficient to nurture superior growth. Amongst the key clusters in the NDP is the construction / infrastructure cluster. This cluster has highlighted the importance of infrastructure investment in employment creation for the low-skilled workforce. Another element emphasised in the plan is promoting employment in labour-absorbing sectors (National Planning Commission, 2013).

It is in the light of all the above factors that the researcher deemed it necessary to conduct this study, in order to look at the capacity of the government to implement its economic policy. The focus of this research is on the infrastructure delivery of the South African government as part of strengthening the economic growth. One of the major public entities mandated to support infrastructure delivery by the government is the IDT.

IDT is a Schedule 2, public entity in terms of the Public Finance Management Act (PFMA) classification established by the government of SA. The mandate of IDT is to support the government with programme management and infrastructure delivery. In dealing with capacity challenges, a host of government entities would contract IDT and allocate a budget with instructions on the nature and the scope of the infrastructure assets to be constructed. Notable infrastructure assets built by the IDT are schools, hospitals, clinics and welfare centres amongst many others (PFMA, 2007).

As a public entity, the IDT is subjected to some of the same arduous processes with which all government entities have to comply. The advantage however is that public entities have their own policies and that offers a certain degree of flexibility. As much as the IDT has regional offices in all provinces in South Africa, this research

is located in the KwaZulu-Natal (KZN) province and the study has focused on the factors affecting the efficient delivery of infrastructure in KZN (PFMA, 2007).

Budget allocations for the KZN provincial government over the past 3 years have been allocated according to Table 1.2 (below). These departments are the biggest levers of social infrastructure spending and are ranked by the researcher in the order of their budget size. The relevance of the research is in the top four departments in the province of KZN, namely: Department of Education (DOE), Department of Health (DOH), Department of Transport (DOT) and Department of Human Settlements (DHS) which have collectively amassed an allocation of 85,84% of the total budget. These are also the departments that have a huge portfolio of infrastructure within their budgets (Provincial Treasury KZN, 2015).

Table 1.2: KZN budget allocation - medium term estimates

Id / Ranking	Summary of Provincial Budget	Medium-Term Estimates		Outer Years	
		2014/15 (R)	% Budget	2015/16 (R)	2016/17 (R)
1	Education	39,446,920	40.79%	42,572,680	42,881,812
2	Health	30,914,196	31.96%	32,881,579	33,821,760
3	Transport	9,060,595	9.37%	9,504,027	10,001,955
4	Human Settlements	3,600,282	3.72%	3,656,033	3,907,814
5	Agriculture	3,070,155	3.17%	3,093,537	3,241,463
6	Social Development	2,497,952	2.58%	2,627,481	2,767,560
7	Economic Development	1,946,940	2.01%	2,037,191	2,102,627
8	Public Works	1,369,361	1.42%	1,372,793	2,046,221
9	COGTA	1,348,076	1.39%	1,362,669	1,435,607
10	Provincial Treasury	834,183	0.86%	758,215	759,449
11	Office of the Premier	741,291	0.77%	723,826	756,894
12	Arts and Culture	705,112	0.73%	806,706	805,982
13	Provincial Legislature	491,186	0.51%	455,994	480,352
14	Sport and Recreation	456,379	0.47%	413,293	435,024
15	Community Safety Liaison	181,295	0.19%	186,069	198,470
16	The Royal Household	54,211	0.06%	56,536	59,549
	Total	**96,718,134**	**100.00%**	**102,508,629**	**105,702,539**

Adapted from the Annual Report of KZN Treasury (KZN Provincial Treasury, 2015).

It is against this background that this study seeks to understand the challenges militating against the optimal use of the infrastructure budget for value creation, economic growth and meaningful socio-economic impact.

1.2 BACKGROUND TO STUDY

In ensuring value of each rand spent, government departments and public entities dealing with infrastructure rollout are tasked with this mammoth responsibility of ensuring that service delivery backlogs are dealt with decisively. According to the NDP (2013), the most efficient rollout relies on a number of efficiencies, which include:

- Completion of projects on time;
- Economical completion of projects i.e. within allocated budget;
- Quality of the workmanship displayed and sustained over the life of each asset built, over the years;
- Competent resources, including human element, to efficiently plan and execute construction works;
- Appropriate spatial planning;
- Integrated planning across all stakeholders in the value chain; and
- Optimal socio-economic impact from each infrastructure asset built.

1.3 FOCUS OF THE STUDY

The focus of the study is on business and management studies with a particular focus on project management.

1.4 MOTIVATION FOR THE STUDY

The study will assist a host of role-players that are managing projects in the built environment, especially those that are in the government and public sector.

1.5 PROBLEM STATEMENT

Failure to finish most projects on time, budgetary overruns and poor quality of workmanship have created a negative perception of as well as an adverse reputation for IDT in managing projects. This also negatively affects budgetary allocations given to IDT in each financial period. As a result IDT has been confined to spending a lot of resources, combating unnecessary operational issues and managing risks that ought to have been avoided by proper planning.

This hampers the role that IDT should be playing at a strategic level to support government: such as setting standards, policy formulation, impact reporting, business intelligence and contributing to accelerated poverty eradication plan as well as providing access to facilities thus improving general wellbeing of communities in the province.

1.6 AIM AND OBJECTIVES

1.6.1 Aim of the Research

This research probes the factors that are affecting the delivery of infrastructure in the province of KZN, by focusing on the IDT. The selected topic was prompted by an observed number of cases where infrastructure projects of the South African government are not yielding desired outcomes, such as on-time delivery of infrastructure and value for money that has not been derived by the government. The most affected are taxpayers, emerging contractors and host communities in terms of socio-economic impact and delivery of infrastructure. The investigation was targeted at getting the engineering perspective on the reasons for this phenomenon, since this sector has a central role in infrastructure delivery, in KZN province.

1.6.2 Objectives of the Research

There are five (5) objectives that this study seeks to address:

- To establish the causes of delays in the completion of projects within the scheduled timeframes.
- To ascertain the impact of project management in terms of providing value for money to the government.
- To assess the impact that can be derived from the optimal use of professionals in the entire life cycle of the project.
- To test the socio-economic impact of the infrastructure delivery on the livelihoods of the infrastructure project host communities.

To establish if the ethical standards of professionals are still exercised to the best advantage of the clients, in execution of projects.

1.7 RESEARCH QUESTIONS

The research questions are tied to the research objectives outlined in 1.6 above. The research intended to investigate the following:

- What are the possible causes of schedule delays and slippage?
- Are the infrastructural projects under IDT representing value for money?
- Can the optimal use of professionals at every stage of the project life-cycle make any difference?
- What are the socio-cultural impacts of these infrastructural projects on the host community members?
- Can the government derive optimal value from ethical and professional standards of consultants?

1.8 LIMITATIONS

Pursuing the participants to respond was quite a challenge given the nature of their jobs which is characterised by extremely busy schedules. The use of electronic questionnaires did not present the researcher with the opportunity for personal engagements with the participants. This would have enabled personal interaction and an opportunity for the researcher to explain at a personal level any questions

that the participants were unsure of. Some participants however did engage the researcher on some areas for clarity, which were well received and addressed during the course of the research.

1.9 SIGNIFICANCE OF THE STUDY

The study was considered important in ensuring that in future, delivery backlogs are curtailed, communities in the province are afforded much needed facilities quicker and that most of the community members are better skilled.

The study will provide strategies for improving basic infrastructure delivery from a cost containment perspective and also assist in advancing enhanced planning, to ensure that there is value creation in future to the departments of the provincial government.

For future planning, the study will be able to better inform the government and other stakeholders of what can be done to improve norms, standards, policies and practice guidelines for the engineering stakeholders.

1.10 CHAPTER OUTLINE

1.10.1 Chapter One: Introduction

This chapter defined the problem with respect to relevant uncertainties and provided context in the form of an introduction to the research topic, context, research problem statement and research objectives for the study. It also outlines the study setting, research questions and how the study will assist, going forward.

1.10.2 Chapter Two: Literature Review

This section deals with the literature review which is relevant to the study. The literature review looks globally at some international countries and government initiatives from regulatory and planning, especially in infrastructure delivery. The literature was drawn from various sources of information, such as journals.

1.10.3 Chapter Three: Research Design and Methodology

The chapter describes the study design in terms of the definition of the population, data collection tools and procedures. It also details how the questionnaire was designed to address the objectives of the research.

1.10.4 Chapter Four: Presentation of Results and Findings

This chapter presents results that emerged from the research responses, summarised and presented in a logical and meaningful manner. This chapter was informed by the detailed analysis and interpretation of the data collected.

1.10.5 Chapter Five: Discussion on Research Results and Findings

In this section, the researcher dissects the information. The results are pragmatic and seek to argue and substantiate some assertions as affirmed by this research.

1.10.6 Chapter Six: Recommendations and Conclusion

Chapter Six sums up the entire research report, summarises the report and provides recommendations that are succeeded by the conclusion of the research. It also outlines areas that were not explored by the research and areas recommended for possible research in future.

1.11 SUMMARY

This first chapter provided the rationale behind the choice of the study undertaken by the researcher. This chapter was able to identify relevant research objectives and questions that assisted the researcher in dealing with the research problem. The research objectives also shaped the choice of literature review chosen by the researcher which is discussed in the next chapter.

The next chapter **(Chapter Two: Literature Review)** focuses on the literature that deals with the subject, looking at international or global studies, the global perspective as well as the local environment.

2. CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

The data sources selected and discussed below are from textbooks and journals mainly. Other sources such as government strategies were also referred to in giving context to the topic, where necessary. The presentation of the literature review has not followed the sequence of sources of authority, but was structured in a cogent logical manner.

2.2 COST OVERRUNS AND TIME DELAYS

Aibinu and Jagboro (2002) mention how delays and time overruns in most projects implemented have become so prevalent. The study encourages scholars to create awareness of this problem of frequent cost and time overruns and to evaluate its effects. This challenge is often underestimated and the ripple effect of paying less attention to it affects many developmental imperatives and the socio-economics of many countries.

The research reveals the impact of delays and the consequential effect on project delivery, and gives some recommendations, notably the acceleration on the project milestones and also making contingency provisions, in the budget to cover unforeseen errors in design (Aibinu and Jagboro, 2002). Although acceleration in project delivery can inadvertently increase the costs of the project in some cases, it is still a necessary intervention in ensuring that completion takes effect within scheduled timeframes.

Notably, the Joint Building Contracts Committee's (JBCC's) provisions cite the contractual period, defect liabilities, construction guarantees and penalties amongst other critical issues. Invoking such punitive provisions can guarantee speedy delivery and enforce performance and adherence to contractual obligations (Maritz, 2014).

The risks associated with construction largely lie with the contractors. The JBCC deals with the termination of a contract by an employer for a contractor's default, and for causing loss and damage, provided the employer is not in material breach of the agreement.

On the recommendation of Albino and Jagboro (2002), the question would be how much can be allowed as contingency provision and how the client can afford to provide for. The widely accepted norm for contingency allowance is 10% to cover the risk of shortfalls that may not have been anticipated. The provision is meant to be kept at a very minimal level and it is intended to cover any incidental cost that may emerge during the construction period. The researcher argues that such provision should be for work elements that could not have been in the forethoughts of the planning team, and that this should not be a buffer for poor planning (Albino and Jagboro, 2002).

Of interest to the researcher was the three tier approach adopted in the study, in trying to establish causes of delays. The approach contrasts the South African results in relation to cost overruns with other global stadia projects, in preparation for mega events such as the FIFA football world cup. The research underscored material cost inflation, delays in payments and design errors as significant drivers. The USD 267 million in budget deficit was also confirmed by the South African Minister of Finance in 2010. The final cost was no less than R16bn from the original estimated R11bn, i.e. 40% above the initial provision (Baloyi and Bekker, 2011).

The material price escalations are inevitable in mega-projects where building components are subject to foreign exchange rates. This calls for professionals to make calculated and well thought out provisions in their estimates and in the advice given to their clients.

The phenomenal growth in portfolio size of construction budget and number of projects has resulted in budgeting and planning problems which present a detrimental outcome to most emerging countries. This could also have an

adversarial effect on the relationships among team members that often leads to trust issues and possible litigations (Alinaitwe et al., 2013).

Experience has shown that disputes may lead to arbitration or court issues that often take long and are usually unplanned and cannot be foreseen. As a result they are not factored into the scheduling because of their nature, where none of the parties would have envisaged disputes that might emerge in future (Alinaitwe et al., 2013).

In India, construction is an integral part of economic growth and is often a very significant conduit to its industry which is developing, and delays are placing a huge burden on the clients' cash flow position (Subramani et al., 2014). The South African government budget planning is based on cash flows and projected spending patterns. Poor spending often results in under-provisioning which is detrimental in infrastructure backlogs and related economic benefits (PFMA, 2007).

Dimensions brought by the study of Subramani et al. (2014) were, amongst others, poor contract management, reworks, long period between design and bidding process, as well as design errors. The study revealed similar characteristics when compared with other countries. The research also illustrated other challenges, such as shortage of talent, land acquisition issues, rising material prices and labour costs.

Subramani et al. (2014) conceded that there are varying causes of delays in construction or engineering infrastructure. Uncontrollable construction costs increase the financial burden to the financial planning of decision makers. It recommends the importance of the early identification of cost drivers to avoid future budgeting problems (Ali et al., 2010). This could possibly signify the importance of joint planning with a host of project stakeholders.

The five parameters of scope, quality, resources, time and cost are interrelated and cannot be separated from each other in a sense that each parameter can in practical terms be the function of another (Chitkara and Kohli, 2007). Project planning then becomes important at the early stages of implementation of project construction, as

opposed to a fragmented process that gets co-ordinated in the later stages when huge damage has already taken effect.

The study by Kikwasi (2013) on the causes of delays and disruptions in projects constructed in Tanzania, identified the sources of risks, which were categorised into technical, social, resource, financial, legal, construction and economic. The interest of the researcher was on the social aspect. Social issues are often under-estimated, resulting in clients not getting the buy-in from host communities.

Findings of the research were able to review main causes such as compensation issues and disagreements on the valuation of work done. The disputes, negative socio-economic impact and the economically active population that is idle job seekers are still significant dynamics of disruptions in project sites (Kikwasi, 2013). Through pressure from the labour unions, the SA government has been forced to implement minimum wages and to craft legislation that seeks to take the concerns of the poor into account (National Planning Commission, 2013).

This introduces the South African legislative environment, discussed below.

2.3 SOUTH AFRICAN LEGISLATIVE FRAMEWORK

The South African legal framework is underpinned by the supreme law, which is the Constitution of the Republic of South Africa, Act No. 108 of 1996. Other critical legislation under the supreme law is the Public Finance Management Act No. 1 of 1999 applicable to all organs of state except in the local sphere of the government. Other important pieces of legislation are the Construction Industry Development Board Act, Act No. 35 of 2000, Preferential Procurement Policy Framework Act, Act No. 5 of 2000, as well as the Broad Based Black Economic Empowerment Act, Act No. 53 of 2003.

The relevance of the above four legislations in relation to the research are discussed below.

2.3.1 Public Finance Management Act No. 1 of 1999

The Public Finance Management Act (PFMA) was introduced to regulate financial management in the national government and provincial governments to ensure that all revenue, expenditure, assets and liabilities of those governments are managed efficiently and effectively. All government institutions including the public entities are bound to comply with this over-arching legislation in running the business. This act has onerous processes and timeframes to be complied with, which also affects the delivery timelines (PFMA, 2007).

2.3.2 The Construction Industry Development Board Act

The Construction Industry Development Board (CIDB) was established in terms of CIDB Act 38 of 2000, the main aim is to provide the register of construction contractors. Contractors must be registered with CIDB if they seek to participate in the infrastructure delivery of the public sector. The register grades all registered contractors from Grade 1 up to Grade 9 according to their capacity to carry out construction work, having ascertained the strength of their business turnover, capital and net asset base. All companies working with the South African Government are registered with CIDB (CIDB, 2000).

There are rigorous processes that regulate the registration of contractors and annual returns that have to be complied with, for the continued registration of contractors as being in good standing. Despite having a stringent filtering system to ensure that contractors are evaluated properly, for grading purposes, there are still a number of contractors that struggle to implement their projects. This is largely because of capacity constraints and lack of resources. The experience has also taught the researcher that some emerging contractors cash flow position gets affected negatively by getting many projects at once, ending up having to overstretch their limited financial resources.

2.3.3 The Preferential Procurement Policy Framework Act

The Preferential Procurement Policy Framework Act (PPPFA) emerged from Section 217(1) of the Constitution of South Africa which states that the organs of

the state should follow the five principles of procurement which are fairness, transparency, equity, competitiveness and cost effectiveness. In order to comply with this requirement, the government is forced to comply with the stringent processes prescribed by the Act, to ensure that there is fairness and openness in the system of engaging consultants and contractors (PPPFA, 2000).

Fairness and openness entails prolonged advertising periods. An all-inclusive approach in the procurement of a project team then takes longer as a result of the legislation. In getting the team to work cohesively, in most cases, team dynamics can also affect the duration of the project while the team is undergoing all phases of the team progression (PPPFA, 2000).

2.3.4 Broad-Based Black Economic Empowerment Act

The Broad-Based Black Economic Empowerment Act (BBBEEA) (Act No. 53 of 2003) was established in 2004 as a legislative framework aimed at promoting the empowerment of black and economically under-privileged people in order to bridge the economic divide between the previously disadvantaged communities of South Africa and the rich, post-apartheid. Apartheid was a system that excluded the vast majority of South Africans from the ownership of productive resources and the acquisition of skills (BBBEEA, 2003).

The act encapsulates codes of good practice in the procurement of goods and services with bias towards the poor and previously disadvantaged in order to deal with socio-economic disparities. The act seeks to take decisive steps to increase effective participation of the poor majority in the economic stream and to promote stability while ensuring economic prosperity. In bringing emerging contractors to the fore, the process gets affected by lack of skills and appropriate resources (BBBEEA, 2003).

2.4 GOVERNMENT PLANNING PROCESSES

2.4.1 Treasury Infrastructure Delivery Management System

The infrastructure delivery model of the South African government is undertaken through the Infrastructure Delivery Management System (IDMS), a system that is mapped out to illustrate the workflow processes of the government, in infrastructure planning and delivery. The model is illustrated in Figure 2.1 (below) and has responsibilities relating to the portfolio management level filtering down to programme management, project management, and up to operations and maintenance of infrastructure assets. The system has appropriate stage gates and an approval process that needs to be undertaken before the next milestone is undertaken (IDMS, 2012).

The level of portfolio management is where the setting of norms and standards take effect, and where the entire infrastructure planning is done. The government has to understand the demographics of each province, to conduct needs assessments, and to be clear on land ownership issues and spatial planning. In this phase the government also has to work on a three (3) year planning cycle, which includes the Medium-Term Expenditure Framework (MTEF) planning cycle, which is discussed in detail below. The prominent feature of this phase is the development of the User Asset Management Plan (U-AMP) which in some departments would be called the Infrastructure Plan. This plan sets out the infrastructure assets planned for the short term and medium-term period (IDMS, 2012).

The next level is the programme management level, where practical issues of design concepts, procurement strategies, implementation plans, detailed designs, monitoring and control activities take place. This phase is then succeeded by the operational maintenance aspects of managing projects once they are complete. These processes are onerous by nature and also contribute to delays (IDMS, 2012).

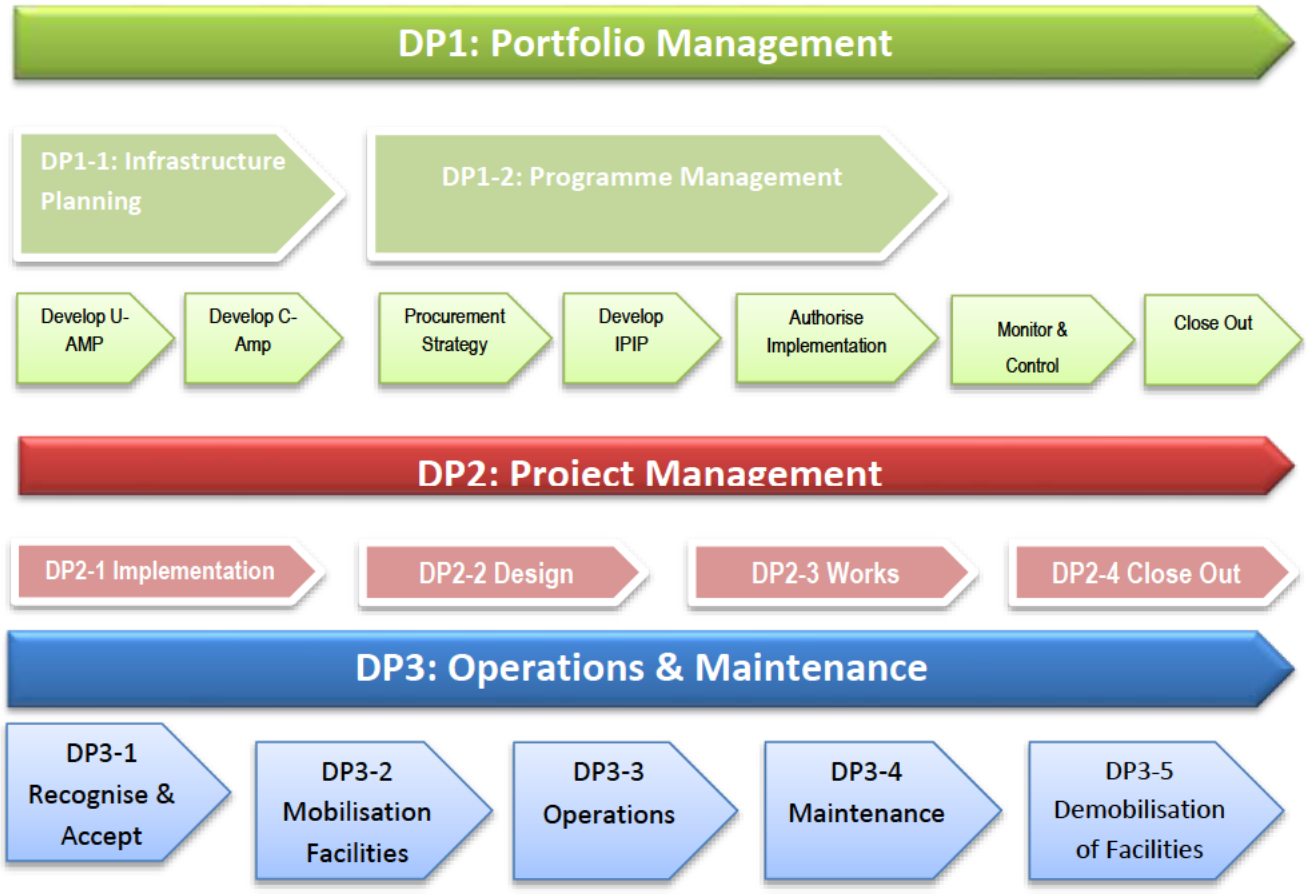


Figure 2.1: Workflow Processes of the IDMS

Extract from the National Department of Public Works Infrastructure Delivery Management System (IDMS, 2012).

2.4.2 Government's MTEF 3 year cycle of planning

The government's MTEF 3 year cycle of planning is illustrated in Figure 2.2 (below). The figure breaks down the IDMS workflow of Figure 2.1 in a logical three (3) year planning cycle of the government. According to Figure 2.2 all project cycle milestones are plotted on a 3 year period which indicates the average length of project delivery, starting from the base year when pre-initiation and initiation processes start. The same process continues in the first year when the previous year's projects are in the planning, procurement and design phase. The same

phenomenon continues in the second and third years with different projects running concurrently, although they are at varying project milestones.

In a nutshell, government planning requires on average a 3 year period to get the projects completed and by the time of contractor appointment many factors such as price hikes would have emerged.

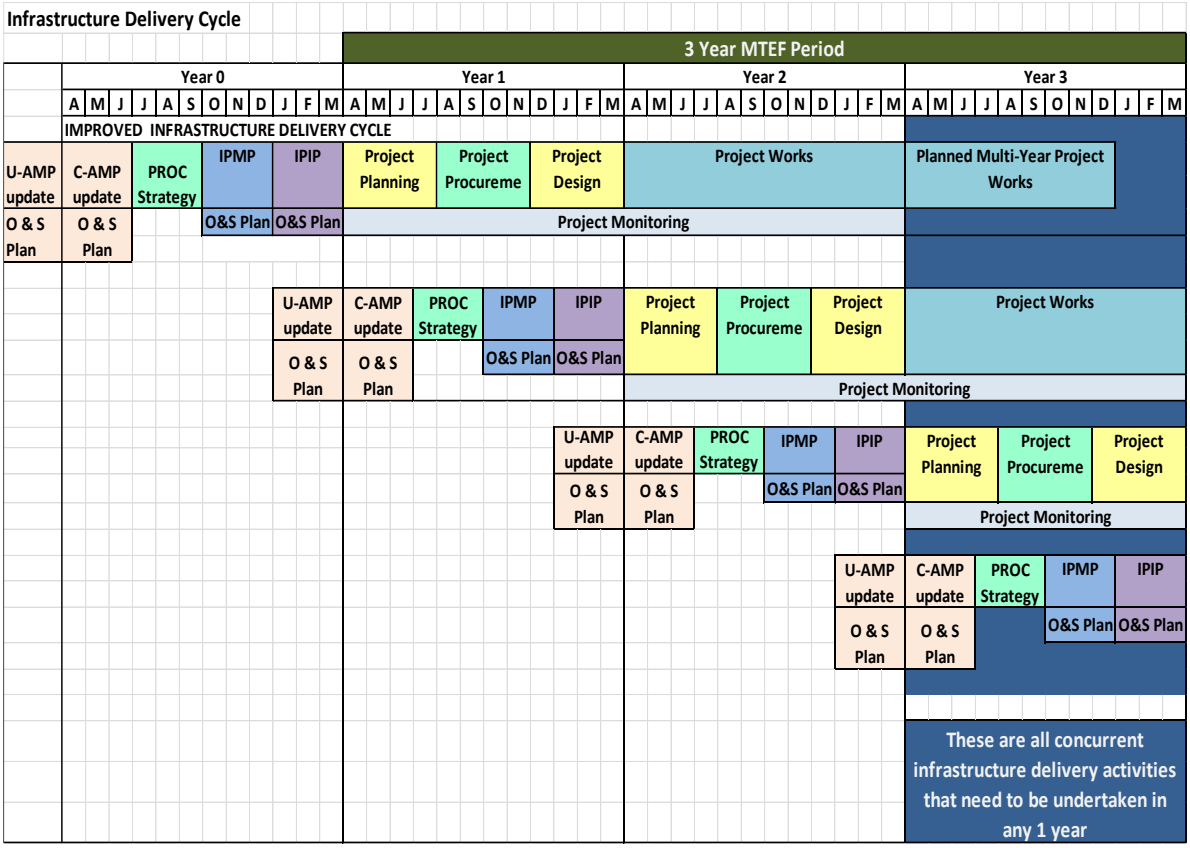


Figure 2.2: A 3 year MTEF Planning cycle of South African government

Adapted from the National Treasury Infrastructure Delivery Management System (IDMS, 2012).

2.4.3 Joint Building Construction Committees

In South Africa, institutions such as Joint Building Construction Committees (JBCC) have formulated standardised agreements such as the JBCC contracts and Professional Service Agreements (PROCSA) with a view to ensuring that contractual issues are tightened in terms of compliance and regulatory practices,

and to guarantee that there is value creation in infrastructure delivery (Maritz, 2014). This takes the study to the next section of the literature review which deals with value creation through project management, discussed below.

2.5 VALUE CREATION THROUGH PROJECT MANAGEMENT

The Project Management Institute (2008) defines project management as the integrated application of the technical know-how together with skills and using the applicable tools and techniques in attaining specific project deliverables, for all project phases.

Creedy, Skitmore et al. (2010) used a regression analysis to investigate any correlation of cost overuns with project risks. The study was able to indicate a positive correlation between budget and overruns. The research argued that highway organisations and public institutions have lost credibility with the press, public and political fraternity largely because of spending patterns that are prompting researchers to suggest that organisations can rebuild their public images by embarking on prudent and realistic programme estimates.

Another observation cited in the study on time delays by Baloyi and Bekker (2011), was the client mandated scope changes, inadequate planning and materials shortages. On the ranking of these factors, a new element emerged, which is the late awarding of contracts by the client. Of interest to the researcher is the factors attributed to the client, which are the scope changes and the late awarding of contracts. Whilst the study seeks to find means of providing value to most clients, some clients have also been found wanting as tributaries to the problem.

The study that sought to establish delays that were located in the Ugandan public sector ranked scope changes, payment delays by the client, lack of monitoring, cost of capital political and labour issues as the top five most prevalent causes (Alinaitwe et al., 2013).

Consideration of the following four (4) constraints in construction is imperative. The constraints are scope, cost, time and quality. The research conducted in Klang

Valley in Malaysia revealed the serious factors attributed to cost overruns were inaccurate or poor cost estimation and design mistakes (Ali et al., 2010). Lack of skills in the government fraternity forces the government to make use of professionals to execute their projects.

A study by Endut et al., (2009) revealed that time overruns were more frequent if compared to cost overruns. The study by Kaming et al. (1997) presented opposite results to this assertion. The researcher has noted the time lag between these two sets of researchers which could indicate possible changes that could have affected the outcome of the research between 1997 and 2009.

Statistical analysis, using regression analysis, in the study on World Bank projects, demonstrated a strong and positive correlation between five success factors. The factors in question were design, monitoring, co-ordination, institutional environment and training interventions. The institutional environment of organisations as well as training interventions should be designed properly to ensure that correlation in these factors is possible. World Bank projects are characterised uniquely by their intangibility which has poverty reduction as an important objective (Ika, 2009).

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 behavioural aspect, identified competency of the project manager. The study suggested that the competency of the project manager also need to be complemented by contingency skills, traits, behaviour, vision in leadership and emotional intelligence as six 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 has also prompted various institutes to develop certain sets of standards for managing projects. These standards have also reflected on the level of awareness and attention paid to project management, signified by a heightened level of growth in the acceptance of formalised project management tools and techniques (Papke-Shields et al., 2010).

Figure 2.3 below outlines the value management system in the project management environment. It describes important components of the project management value system. Of critical importance are aspects where not much attention has been paid at planning level, such as proper needs assessment, developing standards and systems engineering. The review of these aspects has been modelled on the blue-print that worked in the past without any due consideration of the ever-evolving project dynamics and the setting of each project in developing the project charter (Project Management Institute, 2008).

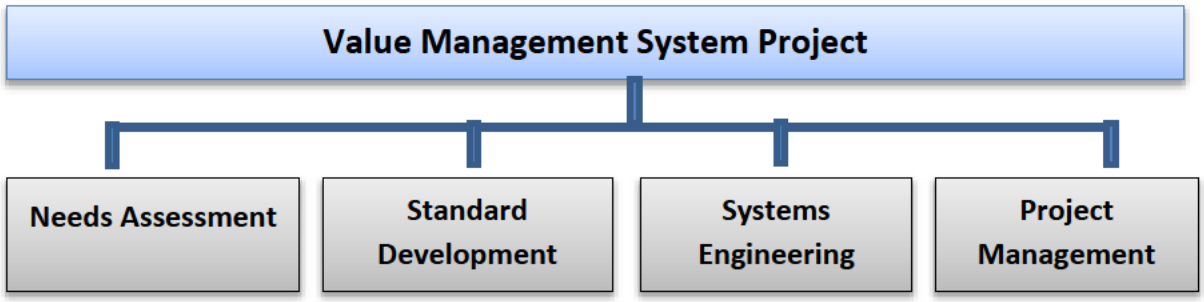


Figure 2.3: Value Management System Project Framework

Adapted from the PMI Guide to the Project Management Body of Knowledge (Project Management Institute, 2008).

The underlying assumption of the system is that the use of project management practices or standards inherently increases prospects of project success. Scholars have presented varying opinions, mostly suggesting the need for an in-depth study into this relationship. Others have also been criticised for opting for smaller samples. The conclusion however cited significant relationships in that there is empirical evidence supporting a positive relationship between the deployment of project management practices and project success (Papke-Shields et al., 2010).

Competency profiles in leadership competencies were examined for the intellectual, emotional and managerial competencies of successful project managers in relation to project success. The study concluded by emphasising the need to elect a project team on the strength of their emotional competencies and recommending transactional leadership qualities for projects that are relatively simple, as well as

transformational leadership on demanding and complex projects (Müller and Turner, 2010). This observation is very meaningful given the magnitude of big projects and the level of innovation required, which calls for dynamic and transformational leadership.

Ika et al. (2012) observed considerable growth in practitioners and academics who have demonstrated keen interest in project management, noting that for organisations to be effective and competitive to succeed, it is imperative in this unpredictable environment to optimise the use of project management tools and techniques such as Gantt-charts for milestone charts and project activities, PERT for scheduling, histograms for resource allocations and S-curves for projections and cash-flows.

The researcher contends that these tools and techniques remain relevant in today's environment, if used appropriately, they are still able to yield desired planning outcomes. The challenge is that as good as they are on paper, they not put into practice and analysed properly during all phases during implementation. The project charter needs to be very clear in defining the purpose of each project. This should be presented in measurable project objectives with clear success criteria. The details should include the high-level requirements, risk identification, budget, stakeholder list, responsibility matrix, levels of authority relating to approvals and milestone schedules (Project Management Institute, 2008).

Cooke-Davies (2002) separated project and programme management from operations management, recommending that operations management ought to optimise the benefits from products and services, while on the other side, suggesting that processes for project management should translate to strategy that feeds into projects or programmes in order to deliver products or services. These two dimensions ought to be integrated into the corporate strategy and goals for improved project success.

2.6 SOCIO-ECONOMIC IMPACT

Figure 2.4 below explains the varying levels of authority and responsibility of important stakeholders within the project. It is understood that the levels of responsibilities will vary during the course of the project life cycle, including passive role-players to very active support participants. The essence of the diagram is to define and understand the importance of each stakeholder within the project and to make every effort to ensure that their demands, needs and expectations are factored in during the planning. The importance of this consideration is to mitigate against delays, cost increases and any negative consequence that may arise during project execution (Project Management Institute, 2008).

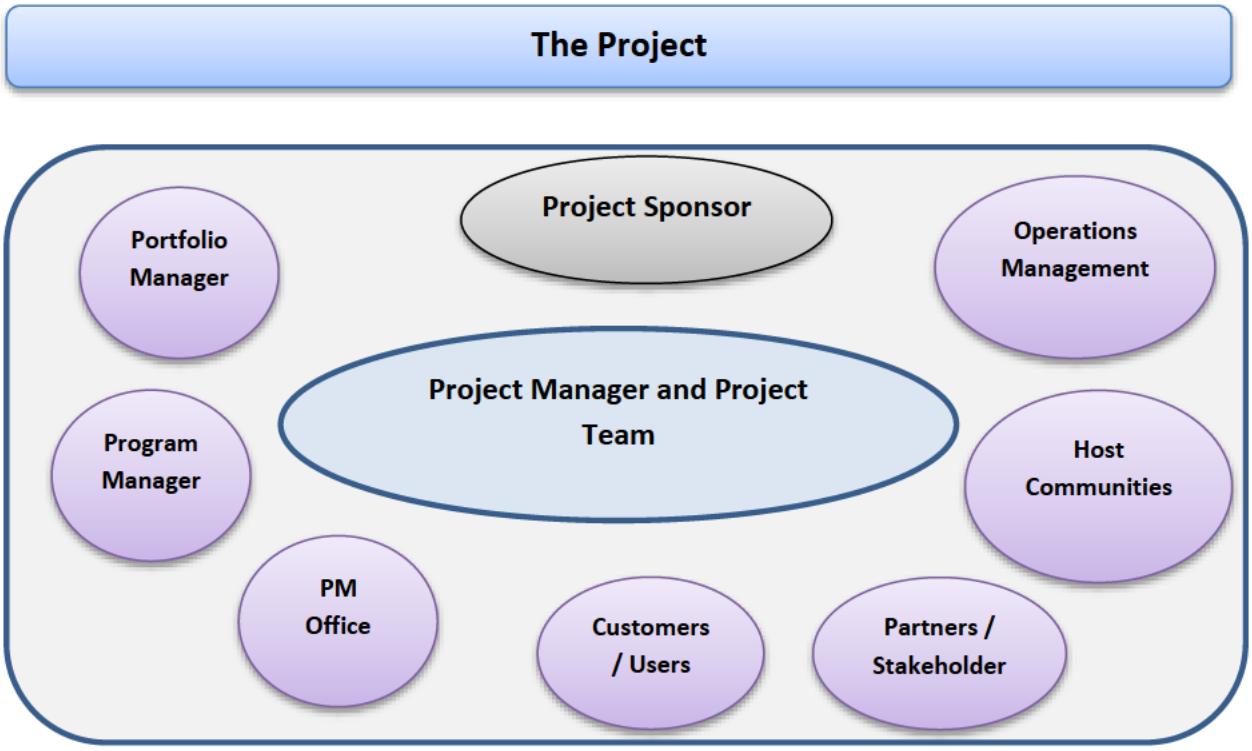


Figure 2.4: The relationship between stakeholders and the project

Adapted from the PMI Guide to the Project Management Body of Knowledge (Project Management Institute, 2008).

Du Plessis (2007) has stated that construction is a very large sector that is capable of yielding millions of work opportunities and also drives the GDP growth levels of significant proportions in most countries. There is a further observation in the research that suggests the broadening of the subject to other allied construction sub-sectors, such as building material production, transportation and property market amongst many others. Therefore this suggests that the narrow view of construction is not beneficial. Instead, if construction is unpacked and viewed in a broader context, there are even more socio-economic benefits that will accrue in the entire value chain.

Du Plessis (2007) brought forward four (4) categories of interpreting construction, i.e. the entire project cycle, every business of construction and related aspects, construction site activity and lastly the broader human settlement interventions. The researcher argues about the narrow view of confining construction to only project

cycle activities relating to the contractor only, while ignoring other broader issues that are imperative at feasibility, design, implementation and commissioning.

There has been a problem in construction in South Africa of trying to match world class standards and perhaps of trying to demonstrate global competitiveness and in some cases of trying to embrace market orientation in the approach. As a result, some construction work has been heavily mechanised with a limited labour intensive approach that would have benefited the unskilled labour or the poor (Pillay and Bass, 2009). This neo-liberalism approach can somehow compromise developmental approach imperatives.

In the research by Alinaitwe et al. (2013) the research recommendations were on transforming from the conventional construction to design-built method. This means a turnkey approach where one practitioner is appointed for the entire suite of professional services and construction work. This method is quite stirring and can really bring much needed efficiencies. There is however question of spreading the economic benefit to many, especially in the South African context and some other developing nations, where labour intensive methods are still preferred in attempting to optimise the intake of labourers working in infrastructure project. Labour intensive approach is viewed by the government as another vehicle of increasing the employment opportunities to the poor.

Kaliba et al. (2009) brought other elements into the discussion, which were environmental protection, inclement weather and strikes due to their prominence in Zambia. Weather and political issues would obviously vary from one country to the other, but these are not entirely different from the rest of the developing nations. The researcher contends that a notable increase in the number of strikes is often the result of wage disputes especially at lower levels of skilled or unskilled labour.

The ranking by Alinaitwe et al. (2013) brought to the fore, poor or lack of training amongst other significant factors that were highlighted by the research. Training is arguably the most important long term investment in the view of the researcher, mostly because of sustainability issues. A killed and well trained workforce is the

most likely to be able to start their businesses, create employment along the way and contribute to the economic mainstream in the long run.

Endut et al. (2009) asserted that Malaysia as a developing country had undergone significant transformation in terms of economic growth with construction having played a major role. Arguably, construction is an important economic driver that can propel employment creation.

Khang and Moe (2008) identified the competency of planners and designers amongst team members on issues of project success factors. This was also complimented by the adequacy of local skills as well as strong ownership of projects by local community. This is quite critical in the South African context having seen a number of protests that culminate in the violent destruction of government property and community assets.

There is a growing trend of taking mega-events to the global south, mostly to countries that are emerging and often those with rapid economic growth. In most cases these nations are characterised by a wealth gap in terms of the extreme poverty of many with the exception of a few wealthy people. South Africa is a classic example of this phenomenon and the researchers have probed the question of what political interests, social effects or economic benefits do mega-projects such as the 2010 FIFA World Cup, New Delhi Commonwealth Games and Shanghai Expo bring to emerging nations (Steinbrink et al., 2011).

The question is how such developments help in stimulating urban development from the economic perspective. The South African bid for the FIFA World Cup was premised on the creation of social and economic opportunities for Africa as a whole and indirectly contributing to nation building. The ex-post analysis revealed insignificant impact on the regional economy (Steinbrink et al., 2011). The research however has a contrasting view on this revelation. Steinbrink et al. (2011) looked at the events only and not entirely at the pre-construction, construction and post-construction socio-economic impact issues.

South Africa has the second highest Gini-coefficient worldwide with Johannesburg at 0.72 in 2010 as the highest in the world. Mega-construction investment compromises the public purse and often results in major building cost explosion on material prices (Steinbrink et al., 2011). This goes against the millennium development goals in dealing with hunger and poverty and pleas for the governments to look at the matter critically.

Some developments of mega structures have resulted in the displacement of informal inhabitants and inevitably result in costs of resettlement to the poor. The need to formalise the local economy drives poor vendors out of the system in the form of stringent licence requirements, trading exclusion zones and trademark rights infringements (Steinbrink et al., 2011). The researcher however argues that the negative impact presented by Steinbrink (2011) relates to the events hosted, not the effects of mega-construction projects.

Construction in preparation for mega-projects contributes to the momentum of the government urban renewal strategies. Such construction also fast-tracks the impetus of developing towns and major cities with economic spin-offs almost guaranteed in a form of GDP stimulation of the economy and the creation of work opportunities (Pillay and Bass, 2008).

Construction in preparation for mega-events has been seen in some circles as mere lip service or a public relations stance that is far removed from the reality and real challenges of inner city wellbeing in the socio-economic status of the poor (Pillay and Bass, 2008). Lessons should be drawn in ensuring that sustainable development is always central in many infrastructure planning interventions and that decision makers ought to be sincere in attending to this issue.

A study by Meredith and Mantel (2011) suggested a host of global challenges in dealing with managing global projects. The challenges amongst many were customs, laws, gender stereotypes, gaining trust of natives and so forth. In dealing with these challenges, the study suggested tools such as training, cultural exchange and the hiring of local skills. The researcher noted the need for communication and

cross-pollination of skills in ensuring that there is a cadre of skilled workforce left to the community, post implementation.

A warning signal is flagged on being overly optimistic where large cash inflow projects are often presented as yielding long terms profits, work opportunities and the physical regeneration of infrastructure. These are often presented in pursuit of political gains of fictitious capital, leading to heightened levels of unemployment and cuts on the welfare benefits (Broudehoux, 2007).

The aesthetics of the cities change as a result of mega-construction and allows countries with such aesthetics to compete in the homogenised global stage while increasing the prospects of being amongst those that international visitors would long to visit, see or invest in (Pillay and Bass, 2009). The above suggests the long term economic prospect from tourism investments.

Pillay (2009) posed a cautionary reminder to stakeholders who are directly involved in the construction industry, such as government, property developers, contractors and the services sector, around key development objectives which have now been largely incorporated into terms of reference for many bid documents used in construction work. This is a very important factor in ensuring that construction is able to contribute towards a developmental state and somewhat forces contractor and professionals to make a conscious effort to address socio-economic imperatives.

There is no dispute over the need for social infrastructure development in emerging countries in an attempt to deal with socio-economic challenges. However, cognisance of the socially responsible approach is paramount. The call has been extended to the practitioners to engage in the discourse for sustainable interventions in infrastructure development (Du Plessis, 2007).

Broudehoux (2007) defines urban entrepreneurlism as the harnessing of cultural resources and perhaps manipulating the urban landscape that is well packaged for capital returns and consumption. Therefore there is substance in the argument that

suggests the economic benefits and long term spin-offs that can be derived from the capital or infrastructural assets of the country, if well marketed to the world markets.

French intellectuals had projected that the image and spectacle of their country would be dominant in the 20th century. Their predictions were on the aesthetics of industrial cities constructed and becoming areas of performance and urban experience (Broudehoux, 2007). Surely the architecture of infrastructure can be commodified and displayed for symbolic consumption or converted into areas of entertainment and revenue generation, given this observation.

Infrastructure in the urban economy can be another revenue stream for staging exhibitions, events, conferences and so forth. The frequent global visibility of the state of the art infrastructure does not only promote the image of the country but also becomes the catalyst for economic growth. China is one example of a country that has been rejuvenating their capital, Beijing's physical landscape and the emblematic strength of their architecture (Broudehoux, 2007).

Another dimension brought to the fore, is the issue of sustainable development, on how human needs ought to be balanced with environmental limits and ideals that are socially equitable. There is acknowledgement that there are real challenges of sustainable construction, especially in the developing or emerging countries. Challenges are not only on the poverty stricken, as this goes beyond poverty even to issues of lower skills profiles, social inequity, erratic rates of urbanisation, poor governance and the lack of capacity of responsible institutions (Du Plessis, 2007).

This brings the study to the aspect of the ethics of professionals in project management, discussed below.

2.7 ETHICAL ISSUES

The Professional Consultants Services Agreement (PROCSA) was created by the Joint Building Contracts Committee (JBCC) representing constituent bodies or members. The agreement was meant to ensure good practice in the building

industry and to forge a certain level of standardisation. Its adoption by the African Association of Quantity Surveyors, Association of Construction Project Managers, Association of South Africa Quantity Surveyors, South African Association of Consulting Engineers, South African Institute of Architects and South African Property and Owners Association bears testimony to this assertion, as it is composed and accepted by the above constituents bodies having been drafted for local and internal usage (JBCC, 2014).

In terms of ethics for professionals, the PROCSA Committee underscored the execution of professional services, exercising reasonable skill, diligence and honouring of the industry obligations in a professional manner. Consultants were anticipated to co-operate and work in good faith in execution of their duties (JBCC, 2014).

Many societies or boards in the engineering field have issued strict professional codes of conduct or stipulations regulating engineers, contractors and consultants on their conduct. The system has been weakened in the past and is unable to instil ethical conduct fully. Tightening ethical issues can assist in revamping the entire system (Githui, 2012).

Githui (2012) has noted that in numerous cases, standards have not been followed to the letter in upholding the highest moral standards. The researcher argues that moral responsibility should be of paramount importance, largely because of its direct effect on people's livelihoods. The researcher contends that professionals often think that obligations to clients should weigh more heavily than the responsibility to the society, yet the profession has clearly set out the professional obligations to the society by the engineers in terms of its definition.

Kenya has witnessed a surge in the number of buildings that are collapsing, in some instances claiming the lives of innocent citizens, largely because of sub-standard workmanship. Questions have been raised on the professional standards applied by the engineers in executing their duties. An argument that has been advanced

was the effect of rapid technological changes that are potentially capable of overtaking regulations that are often lagging behind (Githui, 2012).

The advent of prolific technology and innovations raises a question on issues of public safety and its associated risks. Prominent risk factors associated with the engineering profession are catastrophic in nature (Githui, 2012). The researcher argues that safety issues should be at the helm of the professional team's planning process and that health and safety regulations have to be tightened and strictly imposed.

Corporate citizenry was not a primary concern traditionally in the construction process from planning, design and ultimate demolitions. With emphasis on corporate social responsibilities increasing over time, the demands and expectations of the society on behalf of all stakeholders, have called for a social and ethical approach from policy makers in order to protect citizens (Murray and Dainty, 2013).

Murray and Dainty (2013) have brought a linkage on the issue of corporate activities with various stakeholders that are interfacing with construction, such as employees, clients and communities. All stakeholders therefore have to be identified in each project and the roles clearly defined to warrant that outcomes of project implementation are fully realised and supported by all stakeholders.

2.8 SUMMARY

The literature review was signified by a number of research material studied, which was presented in this chapter. Such material and topics studied are relevant to this study. A number of researchers have dealt with the subject in related literature. There are lots of commonalities on the causes of delays at a client level and there are causes such as longer approval processes in relation to scope changes, budget approvals and the awarding of contracts. At a project level the challenges are quite common and vary from a range of issues such as disruptions to wage disputes, improper designs, and so forth. Poor planning which has a catastrophic impact, and

cost management were amongst several issues. However, cost can be tied to every component of the project that was not well managed therefore the strength of the project manager is critical in this aspect. The review looked at the regulatory environment in the SA context and the noble intentions of trying to protect the vulnerable, although it was noted that it also has unintended consequences in terms of time delays and cost overruns. Despite the regulatory prescripts, the planning processes of the government also contribute immensely to the delays. The literature emphasised the importance of good project managers as well as the tools and techniques that support and promote efficiency. The literature also addressed ethical issues and their relevance in the value-add to the client. On the socio-economic impact, the literature was emphatic on a number of issues that can impact in real terms on sustainable development, and recommended the means of economic growth, skills development and employment creation through infrastructure.

The literature review assisted in developing the research methodology (discussed in the next chapter) that is best suited for this study.

3. CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The researcher used the quantitative research method in quantifying data and generating results from the IDT population, having noted that this public entity has to enlist the services of a professional team, composed of different built environment practitioners, for executing its projects. This data collection method was aimed at easily gathering the data that was ultimately analysed and presented in easy and understandable fashion.

The aim was to design the research in such a way that the requisite data was gathered and analysed to arrive at the solution to the research problem. This research methodology was underpinned by various academic theories behind sampling methods, data collection, the use of effective research tools and so forth. This chapter deals with how the research was designed.

According to Sekaran and Bougie (2011), there are various research design methods that are able to assist the researcher from the problem statement up to the level of data analysis. Figure 3.1 below presents the various research design methods. Only areas that are shaded have relevance to this research, especially in this chapter. In summary, the research strategy was on survey research. The units of analysis were various individuals that were selected from a list of IDT appointed professionals, with the data collection method of the questionnaires being used.

From the aims and objectives of the research presented in Chapter 1 above, this research probed the factors that have been affecting the delivery of infrastructure in the province of KZN. This was influenced by cases where the infrastructure projects of the government were not yielding desired outcomes, such as on time delivery of infrastructure and value for money that had not been derived by the government.

3.2 OBJECTIVE OF THE STUDY

The five (5) research objectives given in Chapter 1 that this study seeks to address, are outlined below.

- Research objective 1 sought to establish the causes of delays in the completion of projects within the scheduled timeframes.
- Research objective 2 was aimed at ascertaining the impact of project management in terms of providing value for money to the government.
- Research objective 3 was to assess the extent of the value that can be derived from the optimal use of professionals in the entire life cycle of a project.
- Research objective 4 was to test the socio-economic impact of the infrastructure delivery on the livelihoods of the infrastructure project host communities.
- Research objective 5 was to confirm if the ethical standards of professionals were still exercised to the best advantage of the clients, in the execution of projects.

The research design to address the above objectives is illustrated in Figure 3.1, below:

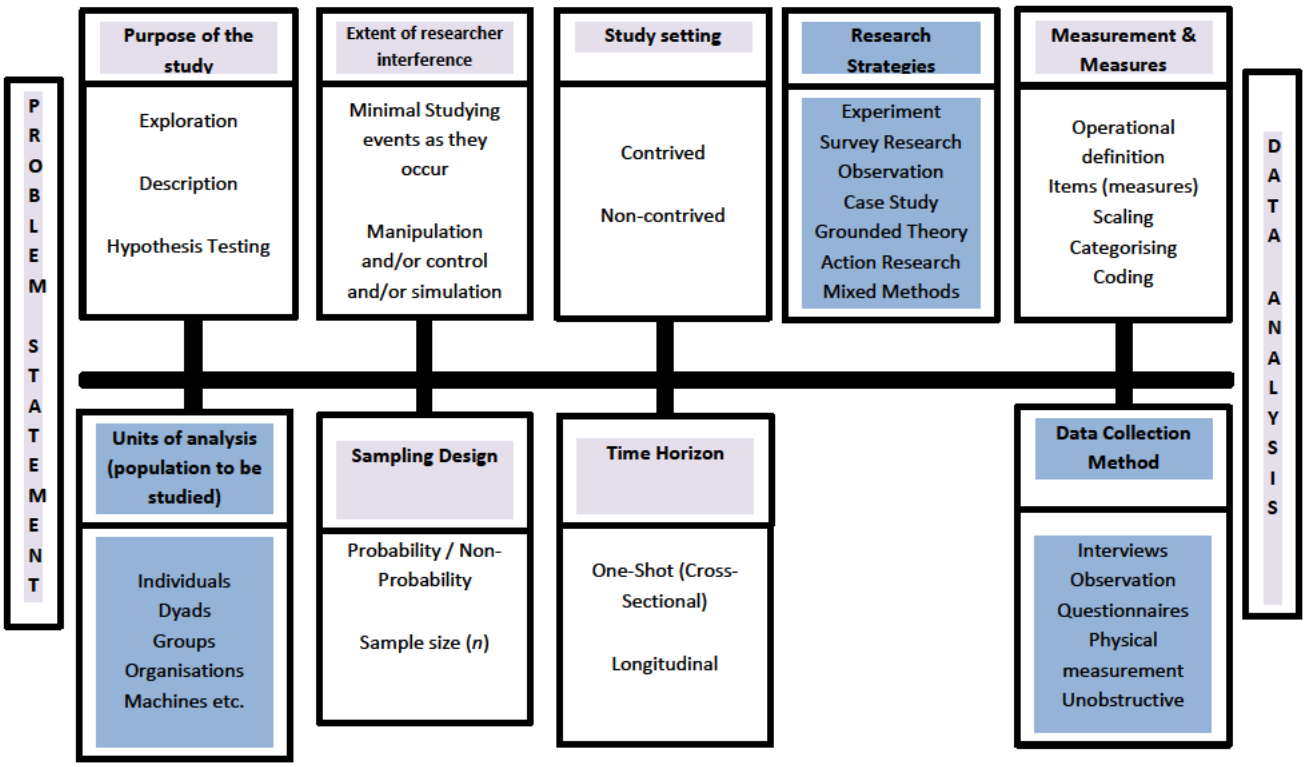


Figure 3.1: Research Design

Adapted from Sekaran and Bougie (2011): Research method for business: A skill building approach.

The research studied the challenges faced by IDT in infrastructure delivery by seeking the views of professionals, i.e. architects, quantity surveyors, civil engineers, mechanical engineers, electrical engineers and project managers. These were practitioners from many disciplines within engineering, design and building specialities who had been involved with IDT projects within the past 2 years.

3.3 TYPE OF RESEARCH

This was not an explorative study, but rather a descriptive study which was quantitative. Sekaran and Bougie (2011) defines explorative study as a collection of quantitative data. In this instance the researcher opted for survey research as opposed to other research strategies such as case studies, observations etc. The

idea was to design the research that would be able to collect data, analyse survey data and produce a report based on the results of the research.

3.4 CRITERIA FOR SAMPLE SELECTION

With sampling being a technique of getting the representation of the entire population, the researcher noted the definition by Ayob (2013) of systematic sampling, defined and expressed as a systematic method based on a pre-determined criterion. This was the method chosen.

In determining the best suitable system, the researcher had to carefully observe the nature and characteristics of the population. In this instance the selection was from the entire population. The names and contact details of the principals for companies contracted to IDT, were utilised.

The population size was 156, listed in Table 3,1 below.

Table 3.1: Breakdown of the research population size

Profession	Population	% Representation
Project Managers	43	27,3%
Civil / Structural Engineers	33	21,1%
Quantity Surveyors	31	19,7%
Architects	23	14,8%
Electrical Engineers	9	5,9%
Mechanical Engineers	10	6,5%
Other	7	4,7%
Total	**156**	**100,0%**

Although IDT has a national footprint in all the provinces of South Africa, this study focused on KZN professionals with active projects in the database of IDT. The census was (N=156) and the sample selected was (n=108).

With the sample drawn or selected for the entire population being 108, this represented 70% of the population. To calculate the appropriate sample size, the researcher used Cochran's formula (Barlett et al., 2001). The formula used is:

$$n_o = \frac{(t)^2 \times (s)^2}{(d)^2}$$

Where,

n_o = Sample size;

t = confidence level at 95% based on the value for selected alpha level of 0,25 (1,96);

s = estimate of the standard deviation of the population (1,07025); and

d = acceptable error margin for mean, estimated at 7 points @ 30% (0,21).

The calculation is:

$$n_o = \frac{(t)^2 \times (s)^2}{(d)^2}$$

$$n_o = \frac{(1{,}96)^2 \times (1{,}07025)^2}{(0{,}21)^2}$$

$$n_o = \mathbf{108{,}8}$$

The recommended and acceptable confidence level for social science research is 95% according to Sekaran and Bougie (2013). The 70% selection was considered adequate, in determining the acceptable level of responses that represented the entire population. The research questionnaires were sent to the 108 participants and there were 82 (76%) responses received. The greater the confidence level, the better for the study to ensure that the results are more reliable, scientific and useful to the findings of the research. The researcher was satisfied with the response rate received.

Curwin and Slater (2008) observed that it is almost inevitable to get non-responses from some participants and they advise that non-response rates are kept at minimal levels. In this case there were non-responsive participants of approximately 24%.

3.5 DEMARCATION OF SAMPLE RESPONDENTS

The sample respondents were both male and female professional engineers. Percentage representation of the gender of the sample of respondents is presented in Figure 3.2 below.

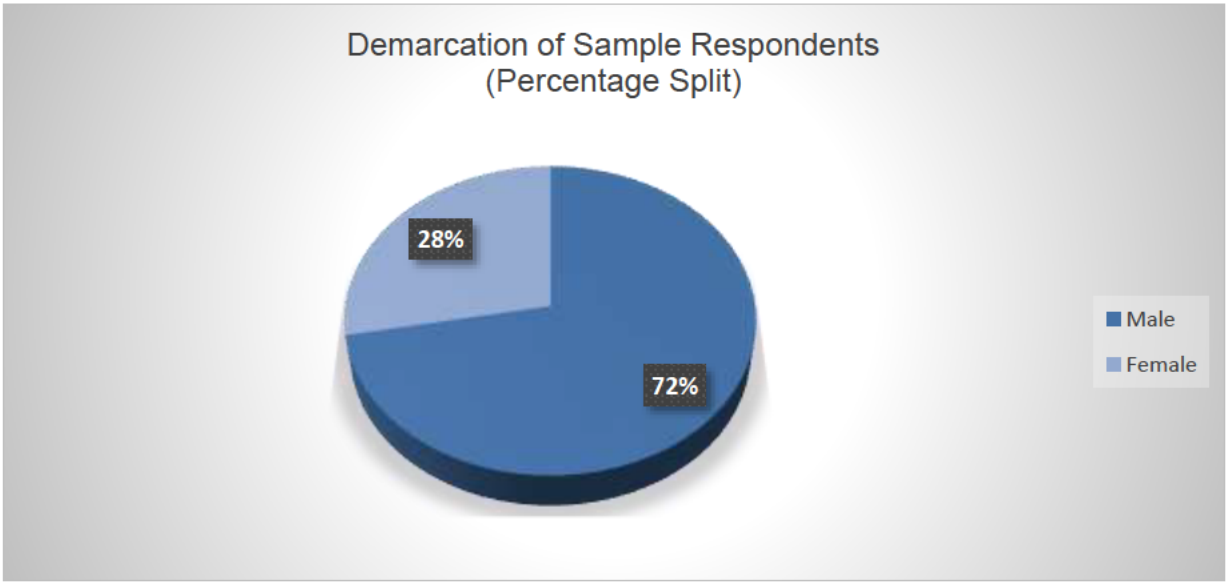
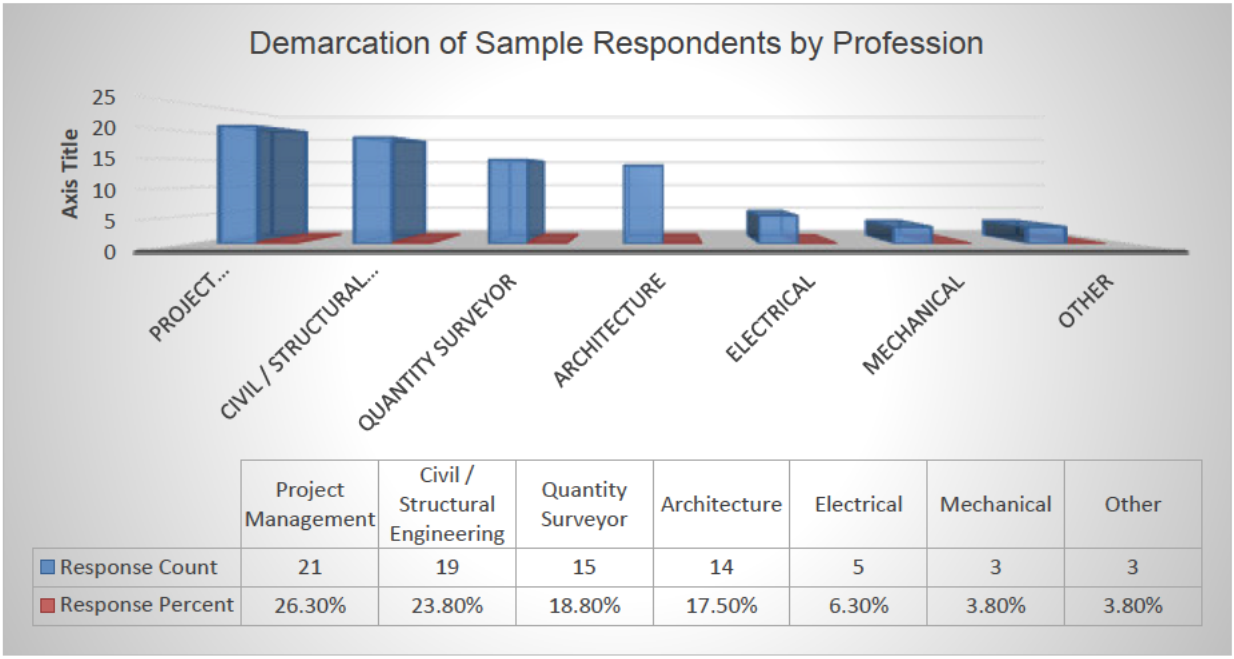


Figure 3.2: Demarcation of Sample Respondents by Gender

The population in the engineering profession in the database of IDT is dominated by males, hence the response count also had a majority of males.

Figure 3.3 below illustrates the demarcation of the professionals in the sample respondents.



	Project Management	Civil / Structural Engineering	Quantity Surveyor	Architecture	Electrical	Mechanical	Other
Response Count	21	19	15	14	5	3	3
Response Percent	26.30%	23.80%	18.80%	17.50%	6.30%	3.80%	3.80%

Figure 3.3: Demarcation of Sample Respondents by Profession

Based on Figure 3.3 above the majority of sample respondents were Project Managers (26,3%), followed by Civil and Structural Engineers (23,8), Quantity Surveyors (18,8%) and Architects (17,5%). The remaining balance was shared by other professions in the built environment, such as Mechanical, Electrical Engineers etc. sharing approximately 13,9% of the response count percentage.

3.6 DATA COLLECTION METHODS

Questionnaires were designed to aid in gathering the biographical data of each participant as well as the information required for the statistical analysis of the independent and dependent variables. This questionnaire consisted of at least five questions of each variable or research objective. After the data was collected, it was then organised and analysed.

The data collection was personally administered, with the aid of technology in utilising electronic questionnaires. The approach was to ensure a wider geographical spread was covered much more quickly and efficiently. The advantage of the approach was that the participants could respond via their cellphones or at the comfort and convenience of their homes, where applicable.

The method was going to guarantee respondents a certain level of anonymity and had the benefit of automatic reminders that were programmed during the survey distribution. The researcher had given most participants prior notification of the forthcoming survey and also persuaded participants telephonically and through cellphone messaging services to complete the survey. All the above methods were best suited to fit this type of research.

The questionnaires were issued via the internet to their respective email accounts. The research tool utilised was the Surveymonkey software, which is able to keep the authentic record of all respondents. Online survey was utilised as the preferred option. This means that the researcher created an on-line survey web page, where participants clicked on the link, completed all sections of the questionnaire and submitted at the end or on completion of the questionnaire.

3.6.1 Primary Data

The study was premised on the issues obtained from the literature review, discussed in Chapter 2 above. The established five research objectives shaped the nature of the questions asked and responses were purely based on the opinions of the participants. The opinions were provided by the participants instinctively, on the basis of their understanding of the subject and their experience.

3.6.2 Secondary Data

The secondary data was also from the literature review. These sources were considered sufficient to deal with the study objectives.

3.7 METHODS OF ANALYSIS

The responses came at different intervals from the participants. The researcher kept inspecting the flow of results from time to time, while thanking those who had submitted their responses and encouraging the remaining prospective participants to participate.

The tool used by the researcher presented graphical information, tables and other statistical information based on the results of the survey. Basic statistical information ranged from calculations of mean, median and standard deviations for all questions. For analysis, the questions which had been scrambled were re-arranged in order to ensure a logical flow to the discussion and presentation of the results.

The report on the completed questionnaires was then exported into an excel spreadsheet for detailed analysis. Excel enabled the researcher to rearrange, sort and summarise the results in a systematic and presentable structure. The report was also burnt onto a disc, as a record and evidence of the research conducted.

3.8 VALIDITY AND RELIABILITY

3.8.1 Validity

To establish if the researcher is actually measuring what he has set out to measure, the validity of the research instrument becomes imperative. Welman et.al (2005) defined validity as the extent to which changes in the dependent variable are indeed a result of the independent variable or whether it could be a result of other factors.

Content validity was the key aspect of this particular research largely because it sought the inputs of professionals responding from the bases of their respective professions. The researcher reviewed the questions and also consulted with two experienced professionals in the field of engineering to solicit their inputs on the questions.

3.8.2 Reliability

This section was imperative for the researcher to try to establish the consistency of the responses. Similar questions were presented differently and the results compared for consistency during the presentation and interpretation of results. The researcher was convinced by the response consistency that suggested that the use of the same tool and set of questions could yield the same results obtained in this research.

3.9 ETHICAL CONSIDERATIONS

Following the approval or permission to conduct the research, the researcher also sought the University's ethical clearance, which was duly obtained. The research questions were then designed to ensure that the autonomy of participants was protected, with an emphasis on the importance of the voluntary participation of participants.

3.10 CHALLENGES/LIMITATIONS

Similar studies have been conducted before and a number of participants were not always keen to assist with inputs. This had been compounded by the time limitations that were given to the participants. The researcher benefited immensely from the working experience and the rapport that has been established at a professional level with most participants.

The research had to be undertaken within a period of 3 months. That time limitation also constrained the research in only using the IDT KZN regional office and not the wider IDT community in all nine provinces.

The relationship between the researcher and the professionals that participated or who were part of the target group engaged with the researcher at the client / service provider professional level. This type of relationship may have impacted on the objectivity of the responses provided by the participants, whereas the participants were expected to respond instinctively to questions. The researcher however encouraged the participants to be as objective and honest as possible in providing answers.

Some targeted participants did not receive their questionnaires timeously, as some defaulted to junk mail. This caused some delay in processing responses. As a result, this challenge limited the number of potential responses that would have been attained for the purposes of the research. In dealing with this challenge, the researcher communicated this to the respective participants, although the timeframes were not favourable.

Sekaran and Bougie (2013) also noted the disadvantage of the inherent nature of electronic questionnaires. This is judged by their low response rates, citing that a 30% response rate is generally acceptable. However the persuasion and constant reminders supported the final response rate received for this study.

3.11 SUMMARY

This chapter was aimed at detailing the technical work done in order to assist in getting the inputs of various participants. These inputs obtained the opinions of the professionals from the various questions that were part of the research objectives. The tools and techniques used were able to gather the requisite data for the optimal analysis of the research problems. The next chapter covers the process of data gathering and presentation of data results through descriptive narrations. The researcher opted for the quantitative research methodology and used the survey questionnaire, which was distributed electronically, to obtain responses from the target population of professionals working in the built-environment, ranging from engineers to project managers. The descriptive data was then grouped into a presentable format and these results are presented in the next chapter.

4. CHAPTER FOUR: PRESENTATION OF RESULTS/FINDINGS

4.1 INTRODUCTION

The presentation of results streams from the 82 responses returned. The questionnaires were distributed to 108 respondents. The 82 responses represent 76% return rate and the researcher considered them sufficient to draw inferences presented and discussed below in this chapter.

4.2 BIOGRAPHICAL INFORMATION

Table 4.1, below reflect that 59 response count was for males and the remaining 23 was for females, totalling 82. This represents a 72%:28% ratio of males to females. This is a fair picture that mirrors the technical and engineering demographics of the province of KZN, in the built environment professions where there are few female players in the industry.

Table 4.1: Biographical information indicating the gender of participants

Gender	**Response Percent**	**Response Count**
Male	72.0%	59
Female	28.0%	23
answered question	**82**	**82**
skipped question	**0**	**0**

The researcher also noted that the respondents were from various professional backgrounds in engineering and built-environment. The researcher also observed that only four (4) out of twenty three (23) females (17%) were directors in their engineering practices. This offered a picture of the extent of male domination in the industry and the profession. The rest of the female respondents were either employed professionals or technologists.

The last set of analysis was on the career backgrounds, professions or qualifications of the participants. Table 4.2 (below) indicates that the majority of participants were construction project managers (26,3%), and in the order of their rankings followed by the civil and structural engineers, quantity surveyors, architects, electrical engineers, mechanical engineers and others. The first four ranked professions accounts for 86% and are the key professions in the construction projects, in that they feature throughout the entire project life cycle. Table 4.2 (below) tables the profiles of the professionals who responded to the study.

Table 4.2: Response count of the research participants by their professions

Profession	**Response Percent**	**Response Count**	**Ranking**
Project Management	26.3%	21	1
Civil / Structural Engineering	23.8%	19	2
Quantity Surveying	18.8%	15	3
Architecture	17.5%	14	4
Electrical Engineering	6.3%	5	5
Mechanical Engineering	3.8%	3	6
Other	3.8%	3	7
Totals	**100%**	**82**	**N/A**

The further presentation of results (below) is on the research objectives, covering the largest component of the research questions, which are structured according to the sequence of the research objectives.

4.3 DESCRIPTIVE STATISTICS

There were 40 questions in the questionnaire, with five being on the biographical information, which has been presented and discussed above. The remaining 35 questions were aimed at addressing the research objectives in the main. The researcher deliberately mixed the sequence of questions in order to avoid any bias from respondents.

The five research objectives and related questions of the research are listed in Table 4.3 below.

Table 4.3: Survey questions relating to each research objective

OBJECTIVES	**QUESTIONS**								
Objective 1	6	12	15	23	24	28			
Objective 2	9	13	14	20	22	27	36	38	39
Objective 3	10	11	25	32	33	34	35		
Objective 4	7	16	30	31	37				
Objective 5	17	18	19	21	26	29	40		

Question 8 was discarded. The researcher opted for the above set of question that sufficiently covered the aims and objectives of the research.

In simplifying the presentation and analysis of the findings of the research, the researcher followed the sequence of research objectives to ensure rationality and sensibleness of the discussion. Another intention was to ensure that the interpretation or analysis was not in disarray, but rather that there was logic in the classification and categorisation of data in the structure of the research.

4.3.1 Research Objective 1: Time Delays and Cost Overruns

The objective was addressing the causes of delays in scheduled timelines for projects and questions relating to this research objective were:

- **Question 6**: To indicate the importance of reducing turn-around times for KZN's provincial governments approval processes;
- **Question 12**: Seeking the opinions of respondents on whether the quantum of budget allocation to IDT by the government should be based on how quick IDT finishes the construction of projects;
- **Question 15**: Establishing if the time taken for approval of scope changes and the management of the variation orders were unreasonably long;
- **Question 23**: Whether the government should increase the number of role-players to augment and speed up infrastructure delivery;
- **Question 24**: To ascertain if contractors, especially emerging contractors, could be empowered or capacitated to be more efficient in infrastructure delivery; and
- **Question 28**: To establish if limitations in the knowledge of health and safety issues contributed to the delays.

The researcher focused on the responses of all professionals in this objective. Table 4.4 (below) presents a table summarising responses for research objective 1.

Table 4.4: Analysis of responses to research objective 1 by all professionals on cost overruns and delays

Question	Very Important	Important	Unimportant	Totally Unimportant	Not Sure	Total
Q6: Reduction of approval processes	49	29	1	2	1	82
% Response	**60%**	35%	1%	2%	1%	100%
Question	**Strongly Agree**	**Agree**	**Not Sure**	**Disagree**	**Strongly Disagree**	**Total**
Q12: Allocating budget on the basis of quick delivery	15	26	7	21	13	82
% Response	18%	**32%**	9%	26%	16%	100%
Q15: Reasonableness of scope approval period	32	42	5	3	0	82
% Response	39%	**51%**	6%	4%	0%	100%
Q23: Increasing the infrastructure team	19	39	13	7	4	82
% Response	23%	**48%**	16%	9%	5%	100%
Q24: Contractor capacity as an enabler	21	42	9	9	1	82
% Response	26%	**51%**	11%	11%	1%	100%
Q28: Health and safety contributes to delays	2	13	20	38	9	82
% Response	2%	16%	24%	**46%**	11%	100%

The researcher also took the deliberate step of comparing the views of project managers against other professionals in the same research objective 1. The rationale behind this was that project managers in the main are entrusted with responsibility of leading the team and of ensuring that the interests of the client are safeguarded at all the times. Figure 4.1 below, presents these comparisons.

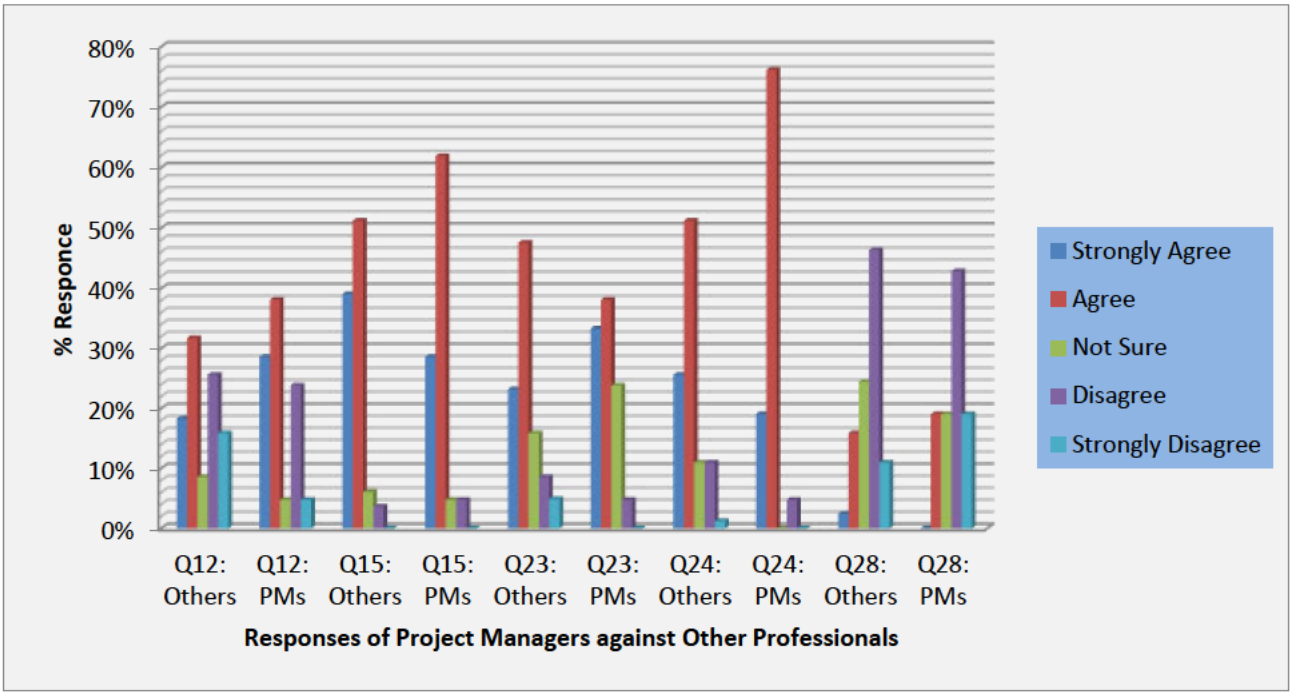


Figure 4.1: Comparisons of project managers to other professionals on time delays and cost overruns

On the basis of the above table, participants believed that the reduction in the approval processes would assist in speeding up processes and that budget should be allocated on the basis of how quickly IDT is able to finish projects. Participants also believed that increasing the number of professional teams in the entire value chain and capacitating contractors could be an enabler to expedite delivery, while also suggesting that the understanding of health and safety issues does not necessarily contribute to delays.

4.3.2 Research Objective 2: Planning and Value-Add by Professionals

Research objective 2 was aimed at ascertaining value created through project management. The questions asked in relation to this objective, were biased towards cost, budget control and value add in infrastructure projects. The questions were targeted at:

- **Question 9**: Ascertaining the importance of proper planning, needs analysis and proper feasibility studies at pre-initiation levels of government planning;

- **Question 13**: Obtaining the consensus that most government projects are not finished within budgetary provisions;
- **Question 14**: Drawing comparisons on government efficiencies against the private sector on time and cost efficiencies;
- **Question 20**: Establishing if costing norms or cost estimates were consistent in all professionals;
- **Question 22**: Probing if an increase in fees could have a positive impact on delivery standards and cost savings to government;
- **Question 27**: Determining the impact of costing in relation to budget variances;
- **Question 36**: Verifying the correlation between budget estimates and costing norms;
- **Question 38**: Finding out if economic factors were the biggest cost drivers; and
- **Question 39**: Confirming if there were any relationship between cost differentials and location of the projects.

This research objective was intended to understand the sensitivity of all role-players on the budget and project costs incurred by the government with respect to taxpayers' money, the public purse and the limited resources that the government budget is able to provide for.

Table 4.5 (below) summarises the responses for research objective 2.

Table 4.5: Analysis of responses to research objective 2 by all professionals

Question	Very Important	Important	Not Sure	Unimportant	Totally Unimportant	Total
Q9: Importance of proper planning by clients	52	25	0	4	1	82
% Response	**63%**	30%	0%	5%	1%	**100%**
Question	**Strongly Agree**	**Agree**	**Not Sure**	**Disagree**	**Strongly Disagree**	**Total**
Q13: Government not completing projects on time	22	37	12	6	5	82
% Response	27%	**45%**	15%	7%	6%	**100%**
Q14: Private sector being more efficient	37	32	7	5	1	82
% Response	**45%**	39%	9%	6%	1%	**100%**
Q20: Consistency of costing norms	3	27	17	30	5	82
% Response	4%	33%	21%	**37%**	6%	**100%**
Q22: Increasing fees can reduce delays	20	30	14	14	4	82
% Response	24%	**37%**	17%	17%	5%	**100%**
Q27: Variances a result of improper costing	7	36	9	24	6	82
% Response	9%	**44%**	11%	29%	7%	**100%**
Q36: Norms have relationship with estimating	7	38	16	15	6	82
% Response	9%	**46%**	20%	18%	7%	**100%**
Q38: Economic factors being biggest cost drivers	18	48	7	7	2	82
% Response	22%	**59%**	9%	9%	2%	**100%**
Q39: Cost differentials related to project location	4	4	10	39	25	82
% Response	5%	5%	12%	**48%**	30%	**100%**

The majority of professionals agreed with the importance of proper needs assessments and well researched studies at the planning phase. Most professionals also concurred with the assertion that government projects were not getting finished on time and that the private sector was much quicker and more efficient in infrastructure delivery.

However, the professional team disagreed that costing norms were consistent from one consultant to the other and disagreed on the effect of project location in terms of cost differentials. They agreed that variances were a result of improper costing and that fee increases could contribute to a much improved performance.

4.3.3 Research Objective 3: Project Management

This research objective deals with value creation through project management science. There were five questions (explained below) that were designed to address this objective.

- **Question 7**: This question ranked the importance of proper designs and documentation;
- **Question 16**: This question solicited views in relation to negligence in dealing with design and documentation that ultimately result in delays and budget overruns;
- **Question 30**: Dealt with the role played by professionals in infrastructure delivery planning processes;
- **Question 31**: Addressed the value that can be created by the role of professionals at strategic level; and
- **Question 37**: Attempted to trade ideas on tools and techniques to improve efficiencies that can be brought by professionals at planning level.

Table 4.6 below summarises the findings related to research objective 3.

Table 4.6: Analysis of responses to research objective 3 by all professionals

Question	Very Important	Important	Unimportant	Totally Unimportant	Not Sure	Total
Q7: Importance of proper design & documentation	60	19	1	2	0	82
% Response	**73%**	23%	1%	2%	0%	**100%**
Question	**Strongly Agree**	**Agree**	**Not Sure**	**Disagree**	**Strongly Disagree**	**Total**
Q16: Negligence in design & documentation	16	25	6	29	6	82
% Response	20%	**30%**	7%	**35%**	7%	**100%**
Q30: Professional input to the government	13	40	16	10	3	82
% Response	16%	**49%**	20%	12%	4%	**100%**
Q31: Strategic role of professionals	27	41	8	3	3	82
% Response	33%	**50%**	10%	4%	4%	**100%**
Q37: Tools to improve efficiencies	14	29	10	14	15	82
% Response	17%	**35%**	12%	17%	18%	**100%**

There is an overwhelming view on the importance of proper accurate designs that should inform documentation and estimation. Professionals also agreed that the limitations in their role that they plan at strategic and planning level could be the biggest set-back to government, in standards setting and norms definitions.

However, there is no absolute view on the issue of negligence of professionals as the major cause of delays. There are extreme views on both sides.

4.3.4 Research Objective 4: Socio-Economic Impact

Seven questions were intended to address research objective 4 which sought to establish the socio-economic impact of the infrastructure delivery on the livelihoods of the beneficiaries. These questions were:

- **Question 10**: Tackles the issues of paying contractors and professionals on time;
- **Question 11**: Addresses value-creation and social impact through imparting technical skills during construction;
- **Question 25**: Probes the extent of technical support that emerging contractors receive from the professional team;
- **Question 32**: Explores the significance of infrastructure, economically;
- **Question 33**: Investigates the importance of infrastructure in the limited levels of skills;
- **Question 34**: Studies the impact of construction in the employability of job-seekers; and
- **Question 35**: Analyses if infrastructure is able to elevate emerging contractors to a level of starting their own businesses.

Table 4.7 below summarises the results received from the participants.

Table 4.7: Analysis of responses to research objective 4 on socio-economic issues

Question	Very Important	Important	Not Sure	Unimportant	Totally Unimportant	Total
Q10: On-time payments of professionals and contractors	54	17	2	2	7	82
% Response of Professionals	**66%**	21%	2%	2%	9%	100%
Q11: Imparting of skills to beneficiaries	41	31	3	5	2	82
% Response of Professionals	**50%**	38%	4%	6%	2%	100%
Question	**Strongly Agree**	**Agree**	**Not Sure**	**Disagree**	**Strongly Disagree**	**Total**
Q25: Technical support to contractors	11	16	13	27	15	82
% Response of Professionals	13%	20%	16%	**33%**	18%	100%
Q32: Economic impact of infrastructure	18	8	9	25	22	82
% Response of Professionals	22%	10%	11%	**30%**	27%	100%
Q33: Contribution to skills levels	6	15	12	37	12	82
% Response of Professionals	7%	18%	15%	**45%**	15%	100%
Q34: Employment created by projects	9	24	12	32	5	82
% Response of Professionals	11%	29%	15%	**39%**	6%	100%
Q35: Infrastructure contribution to business start-ups	4	33	16	24	5	82
% Response of Professionals	5%	**40%**	20%	29%	6%	100%

There is concurrence that paying contractors as well as professionals on time is important and that it can improve on-time delivery. The professional team also agrees that there is a good case for creating value through imparting technical skills to lower levels of unskilled.

The participants disagree that contractors are not given enough support nor that infrastructure has not materially contributed to poor levels of skills arguing that infrastructure does contribute economically through employment opportunities created by infrastructure and business start-ups that are propelled by infrastructure delivery.

4.3.5 Research Objective 5: Ethical Issues

This is the last research objective, which deals with issues of professional ethics. There were eight research questions designed to investigate a number of issues surrounding ethics. The survey questions were:

- **Question 8**: Probing if professionals were using a qualified and best experienced technical team;
- **Question 17**: Establishing if there was a growing trend by professionals of deploying inexperienced staff to do government projects;
- **Question 18**: Understanding whether experience was not a critical attribute for quality in infrastructure delivery;
- **Question 19**: Verifying if construction cost as the basis of total consultants fees often influenced over-estimation;
- **Question 21**: Trying to get an understanding if clients were not given the best value for money by the professional team at advisory level;
- **Question 26**: Investigating if professional bodies had adequately regulated and standardised pricing models;
- **Question 29**: Testing if professional and ethical standards had been deteriorating over the recent years in professionals; and
- **Question 40**: Proving if professionals tended to inflate cost estimation to cover the shortfalls associated with poor service standards.

Table 4.8 below presents the results of the study.

Table 4.8: Analysis of responses to research objective 5 on ethical issues

Response	Q8: Use of the best skill	Q17: Utilising inexperienced team	Q18: Experience as the best attribute	Q19: Project cost as basis for fees	Q21: Value for money to clients	Q26: Regulation of Pricing Norms	Q29: Deterioration of ethical standards	Q40: Cost inflation
Strongly Agree	53	18	2	8	4	9	21	12
Agree	**24**	**30**	8	18	**33**	**30**	**30**	**22**
Not Sure	3	9	3	11	8	18	13	9
Disagree	1	20	27	**32**	22	17	11	21
Strongly Disagree	1	5	**42**	13	15	8	7	18
Totals	**82**	**82**	**82**	**82**	**82**	**82**	**82**	**82**
% Response	**% Q8**	**% Q17**	**% Q18**	**% Q19**	**% Q21**	**% Q26**	**% Q29**	**% Q40**
Strongly Agree	**65%**	22%	2%	10%	5%	11%	26%	15%
Agree	29%	**37%**	10%	22%	**40%**	**37%**	**37%**	**27%**
Not Sure	4%	11%	4%	13%	10%	22%	16%	11%
Disagree	1%	24%	33%	**39%**	27%	21%	13%	**26%**
Strongly Disagree	1%	6%	**51%**	16%	18%	10%	9%	22%
Totals	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

There were fairly balanced views with some consultants agreeing that there was a growing trend of deploying inexperienced teams to undertake government projects and that clients were not always given the best value for money by professionals, indicating that some professionals agree that professional standards have been deteriorating over the years.

Professionals however agree that experience is the most critical attribute for quality in infrastructure team deployment, with most disagreeing that professionals tend to

inflate cost to cover shortfalls that may be a result of poor planning of poor service standards.

4.4 SUMMARY

A percent of 70% of research participants responded to the survey research, 72% of the males and 28% of the females. The participants were from varying professional backgrounds, with the majority being project managers followed by civil/structural engineers, quantity surveyors and architects at 26 (3%), 23 (8%), 18 (8%) and 14 (17,5%) respectively. The balance represents other professional disciplines which had an insignificant impact in the percentage count. The responses were grouped in terms of research objectives.

5. CHAPTER FIVE: DISCUSSION ON RESEARCH RESULTS/FINDINGS

5.1 INTRODUCTION

The research results from the previous chapter have been presented as they were collated. This chapter interprets and explains the findings and also references the interpretation to the literate review. The aim is to establish concurrence or disapproval with other previous researches, if there are any. The purpose is to contribute the inputs to the field of study and to society, and to provide the framework for future research studies related or relevant to this topic.

5.2 FINDINGS OF RESEARCH AND THEIR IMPLICATIONS

5.2.1 Time Delays and Cost Overruns

The research had solicited views of participants on the reasonableness of the scope change approval period. A total 51% of respondents agreed and another 39% are of strong approval, meaning that there is a 90% endorsement by professionals. To back this, there is also a 95% concurrence on the importance of reducing approval processes generally.

Only 50% of the professionals are of the view that budget allocation should be on the basis of how quick the budget gets depleted. This could indicate the depth of understanding by the professionals that it is not only spending that is a root cause of the problem.

The professionals endorsed an increased number of infrastructure delivery teams as another possible solution. A total 71% agreed and the researcher noted this view and also submits that increasing the number should not be confined to physical head count. However there are other means of enhancing project resources.

5.2.2 Planning and Value-Add by Professionals

Research results indicated a 93% approval by professionals who subscribe to the importance of proper planning by clients. On whether increasing professional fees can assist in reducing delays, the responses received were moderate: 61% of professionals agreed or were strongly in favour of this. There was, however, a significant percentage that was not sure or felt this was not extremely important.

There were concerns on the outcome of the research on two questions relating to government projects not completed on time as well as on the question of private sector being more efficient and quicker regarding delivery periods. The consensus is supported by 75% and 84% respectively of professionals who have agreed.

The study quizzed the relevance of costing norms in terms of consistencies and major variances that were as a consequence of improper costing or the relationship between norms and costing. The study did not provide absolute answers that approved or refuted the position of material cost inflations as a major cause. However, on the question of economic factors as the biggest cost drivers, there was an 81% agreement on this assertion from the study.

5.2.3 Project Management

The importance of proper design and documentation was supported by 96% of professionals who claimed the importance or extreme importance of this question. Professional input to government was supported by 65% and the role of professionals at strategic level was also favoured by 83% of participants substantiating this important intervention. A total of 52% of professionals indicated their sentiments and concerns in not being roped in at the planning stages of the project, where they could assist with certain tools and techniques to ensure efficient project management at planning and delivery.

5.2.4 Socio-Economic Impact

In responding to the issues of socio-economic impact 87% of professionals felt that on-time payment of consultants or contractors was important or imperative. A total

of 88% of respondents also agreed with the importance of imparting skills to beneficiaries, especially the host communities.

There were moderate responses to the questions of whether there had been limited support given to contractors where 51% disagreed. This subject may require further interrogation, in order to get an in-depth understanding of the extent of the support and impact derived from the empowerment of emerging contractors.

Although there were no extreme views on the question of infrastructure delivery or projects having insignificant impact economically, 57% disagreed. There are also balanced views in this research on whether projects were able to yield the required level of employability to job-seekers: 45% disagreed and 40% agreed, with remainder not sure. There was no absolute stance on the matter. This also applied to the question on whether infrastructure was able to contribute towards business start-ups: only 45% agreed, 35% disagreed with the remaining balance that was not sure.

5.2.5 Ethical Issues

There was an overpowering 94% agreement in this research that the use of highly skilled personnel was undoubtedly important. This was supported by 84% of the respondents who suggested that experience was the best attribute for project execution.

This research noted the 59% of participants who did not refute the claim that there was a growing trend by professionals of deploying inexperienced staff to government projects. A similar case which had a balanced view, was the question of whether there was a tendency of inflating costs: 42% agreed and 48% disagreed.

Lastly on ethical standards, this research noted that the professionals did not rebut or contest the claim that ethical standards had been deteriorating in the past. There was no outright view on the question of whether clients were being given the best value for money by professionals. 45% of those were in agreement and the same percentage of those disagreed. This means the professionals were also uncertain.

The professionals may have to do some introspection on the level of ethical standards, by retracing the steps that influenced the evolution of project management.

5.3 REFERENCE TO LITERATURE

5.3.1 Time Delays and Cost Overruns

Baloyi and Bekker (2011) observed a number of cases where time delays are a result of client mandated scope changes. This was also supported by Alinaitwe (2013) on ranking scope changes amongst other issues causing delays in the public sector.

Albino and Jagboro (2002) have even suggested making contingency allowances in the project to deal with the issues that may create delays at later stages of the project implementation. Another school of thought suggested that resources are one of the five key parameters that are integral in the integrated planning according to the study by Chitkara and Kohli (2007).

Adding more resources can also assist with acceleration as also suggested by Albino and Jagboro (2002). Although this may assist in speedy delivery, the cost factor will kick-in and this would require clients to make appropriate cost-benefit analysis. The researcher argues that increasing resources presents more risks. Risks can be in many ways and can also result in more delays, disputes and court cases. This is also endorsed by the study of Albino (2002) as well as by Creedy et al. (2010) that validated a positive correlation between cost overruns with project risks. It is therefore imperative that risk areas are kept at minimal levels, largely by proper planning and the implementation of proper monitoring as envisaged by Albino (2002).

5.3.2 Planning and Value-Add by Professionals

Baloyi and Bekker (2011) observed that time delays were also a result of inadequate planning. Khang (2008) also identified the importance of the competency of planners and designers amongst other project critical success factors. The importance of professional input to government planning is also validated by Githui (2012).

Albino and Jagboro (2002) who also mentioned how delays had been prevalent in terms of frequent cost and time overruns, cautioned against the negative consequential effect on project delivery. Steinbrink et al. (2011) echoed strong sentiments on issues of the material price explosion in major building projects and its negative impact on the public purse.

5.3.3 Project Management

The importance of proper design and documentation had an overwhelming view in this study that is also sponsored by Baloyi and Bekker (2011) in emphasising the negative impact caused by design errors. Subramani et al. (2014) also reinforced this view. Arguably, design errors often result in reworks associated with unnecessary cost and delays. The regression analysis by Ika (2012) also provided a strong and positive relationship between success factors and design issues.

This supports Papke-Shields (2010) that suggests that there is empirical evidence supporting a positive relationship between project management practices and project success, implying that project management practices or standards inherently increase prospects of project success. This was also supported by Ika (2009) who cautioned that the use of project management tools remains imperative in today's environment or suggested that tools and techniques remain relevant.

5.3.4 Socio-Economic Impact

The importance of skills transfer is also supported by Du Plessis (2007) who studied how human needs ought to be balanced with environmental limits for sustainable development. Meredith (2011) also suggested a host of global challenges in dealing with global projects recommending tools such as training, cultural exchange initiatives and hiring of local skills. Khang (2008) identified adequacy of local skills amongst project success factors. Alinaitwe (2013) highlighted lack of training amongst other inhibitors to project success, which also agrees with this research. Ika (2012) also identified training interventions amongst success factors. This was supported by 60% of professionals in this research who disagreed that infrastructure projects had not materially contributed to poor levels of skills.

Pillay (2009) argued though, that construction fast-tracks the impetus of developing towns and major cities, citing other economic spin-offs. The issues of strikes and political views raised by Kaliba (2009) is also important since the strikes are always on basic issues, including minimum acceptable wage rates.

5.3.5 Ethical Issues

Ali (2010) argued that the lack of skills in the government fraternity forces most governments to use professionals for their projects. The problems of using an inexperienced team is backed up by the study of Githui (2012) where the study observed the weakened systems of enforcing strict codes by many professional bodies, societies or boards in instilling ethical codes and conducting work with absolute care and diligence. This research also made reference to a number of observed cases where there was a surge in the number of buildings that had collapsed, owing to design errors and the use of an inexperienced team.

Papke-Shields (2010) also endorsed this claim, by suggesting that deployment of inexperienced professionals was a cause of project failures. The deteriorating professional or ethical standards were observed by Papke-Shields (2010). This also emerged in the research by Githui (2012).

5.4 COMPARISONS

5.4.1 Time Delays and Cost Overruns

This section of the study raised the importance of reducing the turn-around times on issues such as approvals and scope changes, and also recommended the need to consider increasing the size or the number of project teams. This research is in line with the literature by Baloyi and Bekker (2011) which observed cases of client attributed delays, Alinaitwe (2013) on issues of scope changes by the clients and Chitkara (2007) on the resources amongst five key parameters for project success. However, the Creedy et al. (2010) and Albino (2002) studies raised a sharp contrast on the issue of increasing resources or the size or the number of project team against the inherent risk factors.

5.4.2 Planning and Value-Add by Professionals

This research underscored the importance of proper planning and increasing the fees payable to professionals. It further confirmed that government projects are not completed on time in most cases, citing the private sector as being more efficient in infrastructure delivery. There were no absolute views on the consistency of costing norms and their impact in major budget variances. The above observations correlate with Baloyi and Bekker (2011) on the importance of adequate planning; Githui (2012) on the relevance of professional input; Khang (2008) on how critical the competency of the planners is; and Albino (2002) on the undesirable costs caused by delays and the effect thereof on project delivery and host communities. This research could not confirm the Steinbrink et al. (2011) study that it is the material price explosion that has a meaningful effect on project costing.

The researcher noted the relationship in the literature between the study by Baloyi and Bekker (2011) and Steinbrink et al. (2011). It was observed that Baloyi and Bekker's (2011) study was premised on the construction projects for the 2010 FIFA World Cup in South Africa. The delivery of stadia was under very tight timeframes and it was necessary that the construction was completed before the start of the games. The research has noted that material costing would have been a major

issue as also confirmed by Baloyi and Bekker (2011) given that the construction had to be fast-tracked and the demand was excessively high given the tight timelines. This was certainly unusual under typical and normal circumstances.

5.4.3 Project Management

This research however could not provide unequivocal evidence that it is negligence in poor designs and documentation that affects projects adversely. The results however accentuated the importance of professionals at the feasibility and conceptual phases and the application of appropriate tools and techniques. These results coincide both with the Subramani et al. (2011) research on the imperative of proper designs and the negative impact of design errors, as well as with Ika (2012) on the relationship between design issues and success factors, Papke-Shield's (2010) focal point was on the project management practices that inherently increase the prospects of project success. This study also confirmed the significance of appropriate project management tools, as enablers to the project success.

5.4.4 Socio-Economic Impact

Meredith (2011), Du Plessis (2007), Khang (2008), Alinaitwe (2013) and Ika (2012) all stressed the impact of skills transfer or training which was confirmed in this research.

The 57% of research participants that thought infrastructure had economic impact, reinforced the case made by Subramani et al. (2011) which suggested that construction is an integral part of economic growth. Du Plessis (2007) validated research that suggested that construction is a very large sector that is able to yield millions of employment opportunities and propel an economy to heightened levels. This is also supported by Broudehoux (2007) who found that the construction of infrastructure in the urban economy can be another revenue stream.

This research concurs with the findings of Pillay (2008) and notes that reference is made there to the long term economic benefits to the country or the economy. This also goes with Brouderhoux's (2007) idea of the manipulation of urban landscape

for economic benefits that was adopted in France. As much as the researcher agrees with these views, the research by Pillay (2009) addresses the economic impact in the urban setting, not necessarily the impact where there is extreme poverty and huge wealth gaps which were also identified by Steinbrink et al. (2011). This research is able to back Steinbrink et al. (2011) in that mega-projects have insignificant employment impact, where there is extreme poverty. Construction models create temporary employment and not necessarily long term and sustainable employment.

This research is unable to argue with authority on whether the infrastructure projects are able to yield a fair amount of employability or whether projects are able to elevate construction employees to the level of creating their own businesses.

5.4.5 Ethical Issues

On the question of deteriorating professional or ethical standards, this research corresponds with the study by Papke-Shields (2010). Professional bodies should be getting concerned about this development which also emerged from the results of Githui (2012) advocating that the moral responsibility of professionals is supreme.

The researcher noted the narrow margin in the contrasting views on whether professionals tend to inflate cost in order to cover any potential shortfall during the life of the project. The researcher is of the view that it is necessary that this topic becomes a subject for further research.

5.5 SUMMARY

This chapter summarised and provided discussion based on the research findings. The research findings were also reviewed in comparisons to the literature that is discussed in Chapter 2. The literature review provided a very meaningful insight into the findings of other researchers in similar subjects. There is concurrence or disagreements amongst the previous researchers and the results that were discussed above. The next chapter concludes the entire research, where recommendations are also made.

6. CHAPTER SIX: RECOMMENDATIONS AND CONCLUSION

6.1 INTRODUCTION

This is the last chapter of the study and seeks to summarise and provide answers on the research problems, i.e. whether the problems have been solved.

The research has been able to assist a host of role-players in the built environment in understanding the depth of the root causes of delays. The problems are not necessarily unique to the South African public sector, since there were many commonalities drawn from other countries that experience similar challenges.

In going forward, the role-players should take the recommendations of this study and also take cognisance of this study in designing their delivery models. This is to ensure that the pitfalls of the past are avoided for future cost and time savings as well as for deriving much needed value to the taxpayer and project beneficiaries.

6.2 IMPLICATIONS OF THIS RESEARCH

The implications of the study vary from changing the tradition on how the delivery of projects has been done in the past to challenging the professional bodies and the regulatory environment. The regulatory environment of the government should not be cast in stone. These regulations also were not designed to be rigid forever. Whilst they were for noble intentions in most cases, the delivery of infrastructure has to take another trajectory once again, noting the period since post-apartheid and the growing impatience amongst the poor who have been yearning for life changing development that they are yet to experience. The revision of legislation is a norm and from time to time new laws have taken effect as and when there is a compelling cause.

Studies on the causes and root causes have been extensively studied by the scholarship. A new trajectory does not necessarily require answers to the problems, but solutions in re-modelling the delivery prototypes. New delivery prototypes can

be modelled on efficiencies, drawing lessons from the private sector, sensitivity towards unnecessary costs incurred by government, the extreme impact to the poor or unsustainable development, skills leverage and ultimate economic impact.

6.3 ADDRESSING THE RESEARCH OBJECTIVES

The five (5) research objectives that this study sought to address, outlined below, were addressed by the research, although there are some that were not adequately covered and hence are recommended for further future research, in 6.3 below.

6.3.1 Research Objective 1

To establish the causes of delays in the completion of projects within the scheduled timeframes, there was an overwhelming consensus on the causes of delays. Of interest is that most causes are common even in other studies conducted elsewhere, including other countries. It is left to the government to understand the root causes and implement appropriate measure to curtail delays.

6.3.2 Research Objective 2

In order to ascertain the impact of project management in terms of providing value for money to the government, this research raised two prominent points, which are planning and the impact of price inflation on projects. Whilst the government has a three year planning cycle, there seems to be a limitation in value-add. This calls for a review of the planning resources and inputs in the government planning and delivery model, to ensure that there is optimal value created.

6.3.3 Research Objective 3

In assessing the impact that can be derived from the optimal use of professionals in the entire life cycle of the project, this point correlates well with the research findings of research objective 2, as one of many inhibitors to proper planning, and also in terms of application of the project management science effectively. This goes with ensuring that there is engagement of professionals from conceptual stages of planning, throughout the entire project life cycle.

6.3.4 Research Objective 4

Arguably, this is one of the most important objectives in the South African context. This objective, which was to test the socio-economic impact of the infrastructure delivery on the livelihoods of the infrastructure project host communities, was able to create a platform for further studies and send the message that long term employment opportunities are more sustainable than the short term ones that are currently gained by host communities. This research also revealed that the infrastructure assets built can also be a source of revenue and contribute to economic growth in the long run, if planned properly. The government and other role-players should therefore invest significantly in understanding how other countries have optimised this benefit.

6.3.5 Research Objective 5

This research was also able to establish if the ethical standards of professionals are still exercised to the best advantage of the clients, in the execution of projects. Some professionals were proponents of this assertion while some others had strong opposing views. This would require further engagement from research and further dialogue. The question of ethics cuts across many fields and future studies could also try to establish if there is any relationship with moral decay in society, generally and perhaps with the culture that has evolved over the years.

6.4 RECOMMENDATIONS TO SOLVE THE PROBLEM

Based on the discussion above and the issues raised by the research, it is recommended that the factors that are central to delays are presented to IDT teams and also shared with clients, with a view to reviewing all the cumbersome processes and milestones in the value-chain. The review should address the following:

- How decision making processes are fast-tracked;
- How government can model some efficiencies in their systems and processes, by learning from the private sector;
- How the government engages the professionals and redefines their terms of references, including review of fees payable;
- How cash flow challenges that supress speedy delivery of projects can be improved and
- Review if there could be better methods to ensure that skills transfer, empowerment and real economic benefits can accrue to the host communities and the extreme poor.

6.5 RECOMMENDATIONS FOR FUTURE STUDIES

The focus of future studies should be on areas that were queried by this research where there was no consensus, such as:

- Improving or standardising costing norms and gearing towards accuracy;
- The extent of negligence on designs, estimating and documentation by professionals and the cost thereof to the government;
- The real impact of infrastructure project delivery models to the poor and the drive towards sustainable development; and
- Driving towards the reinvigoration of professional standards for the new trajectory.

The study deliberately looked at the engineering and built-environment perspective. Changing the angle of the research to the most affected, such as the poor, could yield other solutions.

6.6 SUMMARY/CONCLUSION

The research questions were relevant to the research problem. They were able to establish problems and the causes thereof. They also highlighted the need to optimise the use of professionals and paying attention to project management science such as the use of appropriate tools and techniques as enablers. The study also highlighted the need for a serious relook at socio-economic and ethical issues.

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APPENDICES

APPENDIX A: RESPONDENT CONSENT FORM

Dear Respondent,

MBA Research Project

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I, Mlungisi Khumalo (Student Number: 211 536 078), an MBA student at the Graduate School of Business and Leadership, of the University of KwaZulu-Natal, working for the IDT, kindly invite you to participate in a research project entitled:

CHALLENGES FACED BY THE INDEPENDENT DEVELOPMENT TRUST IN SUPPORTING KWAZULU NATAL'S PROVINCIAL GOVERNMENT'S INFRASTRUCTURE DELIVERY

The study aims to investigate:

- Why most government projects are not completed within scheduled timeframes, scope and original budget allocations. This includes the causes of substantial variances or differentials in project cost estimation from one team to the other (in terms of costing norms);
- What impact infrastructure delivery can contribute, in light of the current challenges of lack of appropriate skills within the province; and
- What can IDT recommend to the Government at a strategic level, to ensure that there is value for money and sustainable impact to the general public from infrastructure delivery programmes.

The study will provide strategies for improving basic infrastructure delivery from a cost containment perspective and will also assist in advancing enhanced planning, to ensure that there is value creation to the departments of the provincial government.

From a planning perspective, the investigation will be able to better inform the government and other stakeholders of what can be done to improve in terms of norms, standards, policies and practice guidelines.

This is considered important, in ensuring that delivery backlogs are curtailed and that the communities of the province are afforded much needed facilities and that the communities are better skilled, much quicker.

Your participation is this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequences. There would be no monetary gain emanating from participating in this research. Confidentiality

and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, University of KwaZulu-Natal.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me or my supervisor, the details of which are listed above.

The survey should take about 10 – 15 minutes to complete. I hope you will take some of your precious time to complete.

Sincerely,

Duly Signed

Mlungisi Khumalo

Student/Researcher

Signature: …….. Date: ……

This page is to be retained by the participant.

Dear Respondent,

MBA Research Project

Researcher: Mlungisi Khumalo (0027 71 370 7350)

Email Address: Khumalo_Mlungisi_Research@webmail.co.za

Supervisor: Professor Elias Munapo (0027 31 260 8943)

Email Address: munapoe@ukzn.ac.za

Research Office: Ms Mariette Snyman (0027 31 260 8350)

Email Address: Snymanm@ukzn.ac.za

Research Project Title:

CHALLENGES FACED BY THE INDEPENDENT DEVELOPMENT TRUST IN SUPPORTING KWAZULU NATAL'S PROVINCIAL GOVERNMENT'S INFRASTRUCTURE DELIVERY

CONSENT

I

……

…….. (Full names of participant)

Working for

……

(Full company name)

Hereby confirm that I fully understand the contents of this document and the nature of the research project and I consent fully to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT: ……

DATE : ……..

APPENDIX B: QUESTIONNAIRE

The participant or respondent is the Member of the Professional Team involved and actively participating in the KZN infrastructure delivery and IDT Project / Programme Managers.

SECTION A: PERSONAL DATA

This section of the questionnaire refers to biographical information. Being very mindful of the sensitivity of information below, it is however of extreme importance in terms of grouping and drawing appropriate conclusions relative to class or group of respondents. Your understanding is appreciated and please note, that your responses remain highly confidential and as such, will be treated with highest degree of classification.

Kindly cross with (X) the selected or relevant block in the space provided.

Date Questionnaire Was Completed

(dd/mm/yyyy)

Participant's Unique ID

Agreed to Participate

1. Yes ☐
2. No (Then stop completing questionnaire) ☐

1. Gender

Male	1
Female	2

2. Age

Below 25	25 < 35	35 < 45	Above 45
1	2	3	4

3. Ethnicity

African	1
Coloured	2
Indian / Asian	3
White	4

4. Profession / Career Profile

Civil & Structural	1
Quantity Survey	2
Architecture	3
Construction Management	4
Project Management	5
Electrical / Mechanical	6
Other	7

5. Your role within company represented

Member	1
Director	2
Professional	3
Technician	4
Other	5

Section B

This section of the questionnaire explores your views from the built environment perspective on infrastructure delivery (various projects) by the KZN provincial government.

Please rank the following issues according to their order of importance in relation to, expedient and efficient infrastructure delivery by the KZN Provincial Government:

Category	Totally Unimportant	Unimportant	Important	Very Important
6. Reduction in response / turnaround times or reduced time for approval processes.	1	2	3	4
7. Correct designs, Bills of Quantities and documentation, with extremely accurate estimates.	1	2	3	4
8. Use of qualified and best experienced team in infrastructure delivery.	1	2	3	4
9. Proper planning, needs assessments, and well researched feasibility studies.	1	2	3	4
10. On time payments of consultants and contractors.	1	2	3	4
11. Value creation is on the life skills and technical skills left with the beneficiaries / community members in the project.	1	2	3	4

To what extent do you agree with the following statements?

12. Budget allocation to IDT should be based on how quick they finish projects on time.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

13. Most government departments are not finishing their projects within original budget allocation.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

14. Delivery of infrastructure, in private sector is much quicker and often delivered within scheduled timeframe and budget allocation.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

15. Scope change management and approval processes are unreasonably longer.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

16. Design errors, poor quality of documentation and estimation as well as general negligence are major causes of delays.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

17. There is growing trend by consultants of deploying inexperienced staff to undertake government projects.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

18. Experience is not a critical attribute to ensure quality in infrastructure delivery.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

19. Construction cost as the basis of total consultants fees chargeable often influences over estimation.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

20. Project costing is consistent from one consultant to the other in terms of costing norms.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

21. Clients are not given the best value for money by the professional team at advisory and professional services level.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

22. Increase in fees paid by clients can guarantee best service by professional team.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

23. Government should attract more companies (contractors and consultants) to participate in the infrastructure delivery to speed up delivery and reduce infrastructure backlog.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

24. Capacity of most contractors is the enabler (solution) to the government service delivery.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

25. Contractors do not get enough technical support from consultants.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

26. Professional institutions have adequately regulated and standardised pricing / estimating regime in the built industry.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

27. It is improper costing standards that result in major budget variances, especially in comparing original budget allocation and final costs to complete projects.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

28. Limited knowledge of Health and Safety issues contributes to delays in on-time delivery failures.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

29. Professional and ethical standards have been deteriorating over the recent years amongst various professional disciplines.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

30. Contractors and consultants have limited input in the KZN provincial government's infrastructure delivery.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

31. Professional input at strategic level and use of appropriate tools and techniques can guarantee value for money on infrastructure delivery.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

32. Infrastructure delivery has insignificant impact, economically.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

33. Infrastructure projects have not materially contributed to the current levels of skills base within poor communities.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

34. Projects are able to yield the required level of employability within the current number of job seekers.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

35. The infrastructure projects are able to elevate most project employees to a level, where they are able to start their own businesses, successfully

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

36. The norms and standards have a strong correlation with budget estimates.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

37. Professionals have little role to play at planning, standards setting and definition of norms.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

38. Economic factors are biggest cost drivers.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

39. There is no relationship between cost differentials and location of Projects.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

40. There is a tendency to inflate cost estimation to cover the shortfalls, that may emerge during construction, attributed to poor quality of work done be professionals.

Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1	2	3	4	5

Thank you so much for taking your time to participate in this research!

APPENDIX C: ETHICAL CLEARANCE CERTIFICATE

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

28 September 2015

Mr Mlungisi Jimmy Khumalo (211536078)
Graduate School of Business & Leadership
Westville Campus

Dear Mr Khumalo,

Protocol reference number: HSS/1335/015M
Project title: Challenges faced by IDT in supporting Kwa-Zulu-Natal Provincial Government's Infrastructure Delivery (from Engineering perspective)

Full Approval – Expedited Application

In response to your application received on 20 September 2015, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have 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.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied for on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

You[redacted]

.....
Dr [redacted]hair)

/ms

Cc Supervisor: Dr Elias Munapo
Cc Academic Leader Research: Dr Muhammod Hoque
Cc School Administrator: Ms Zarina Bullyraj

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
Westville Campus, Govan Mbeki Building
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Website: www.ukzn.ac.za

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APPENDIX D: TURNITIN RECEIPT AND SUMMARY FORM

Turnitin Originality Report

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From Final Chapter (Dissertation)

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paper text:

CHALLENGES FACED BY IDT IN SUPPORTING KWAZULU NATAL'S PROVINCIAL GOVERNMENT'S INFRASTRUCTURE DELIVERY CHAPTER ONE: INTRODUCTION The root of government failures or success lies in the economic policies and decisions around appropriate economic mix and how best a government is able to yield optimal output. It has been argued that the intervention of the government should be able to address market failures (Schiller and Hill, 1993). Gross Domestic Product (GPD) is arguably one of mostly used measures of economic growth, defined as sum of goods and services produced within boarders of respective nations. Central to GDP calculator is the government spending or government services, consumer goods, investment goods as well as net exports (Schiller and Hill, 1993). Like many economies, South African (SA) government has put infrastructure spending at the centre of its economic growth strategy. With limited resources and slow economic growth, it is critical that the government takes stock of how each rand and cent is accounted for, including prudent fiscal discipline (Zuma,

APPENDIX E: CONFIRMATION OF EDITING BY LANGUAGE EDITOR

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Registration number: 131 804 NPO

Editing Confirmation

31/10/2016

Dissertation title: Challenges faced by Independent Development Trust in supporting the KwaZulu-Natal provincial government's infrastructure delivery

Author: Mlungisi Jimmy Khumalo

Supervisor: Prof Elias Munapo

This serves to confirm that the abovementioned document was edited substantively by a member of the KZN Language Institute's professional English language editing team. Tracked changes, corrections and suggestions were made, which the author was responsible to attend to. The final document was not proofread after the above changes were made. As a final stage, the student was assisted with creating the automatic Table of Contents, List of Figures and List of Tables and with final layout.

[redacted]

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