UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

INCORPORATING SUPPLY CHAIN TECHNIQUES: TOTAL QUALITY MANAGEMENT AND PROCESS RE-ENGINEERING AT THE UNIVERSITY OF KWAZULU-NATAL LIBRARIES

By

Nontobeko Mthiyane

210540770

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College of Law and Management Studies

Supervisor: Mr. Christoper Chikandiwa

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INYUVESI YAKWAZULU-NATALI

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Name: Nontobeko Mthiyane	No: **210540770**	
Title: **Incorporating Supply Chain Techniques :Total Quality Management and Process Re-engineering at the University of KwaZulu-Natal Libraries**		
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ABSTRACT

The most important unit of every academic institution is the library. When assessing the state of an institution, visitors from across the globe start by visiting the library. If the library is in shambles, it becomes evident that the institution somewhat requires intervention. Supply chain management has been identified as a solution to inefficiency problems faced by many organizations. As a means to save costs, increase efficiency, eliminate waste and improve quality, organizations are moving away from the traditional methods of operating and are recruiting supply chain techniques, including the Total Quality Management (TQM) and process re-engineering.

This study aimed to explore the techniques which can be used to move from a traditional brick-and-mortar library setting to a virtual setting of retrieving information as a means of maintaining quality and efficiency of services. Users of libraries are technologically driven and require access to information from wherever they are, without having to visit the premises. A qualitative study was done across the five UKZN campus libraries by way of interviews. Ten library management and employees in positions where advancements are necessary or implemented participated in in-depth interviews to find out whether the implementation has been beneficial to support research, teaching and learning. A purposive sampling method was used to select participants and data collected was a transcribed verbatim collated into themes using coding. It is thus established from the findings that libraries must rethink their processes, which can be done by employing supply chain techniques as a vehicle to deliver the change required by the 21st century library users. Based on these findings, the following recommendations were made:- to employ triple bottom line reporting should form part of the UKZN libraries strategic plan, monitoring of electronic resources turn-aways, employ an effective risk management procedure, invest in research and development, incorporate reserve logistics and third-party logistics in processes.

Key words: Supply Chain Management; Total Quality Management; process re-engineering; service industry; continuous improvement; academic libraries.

TABLE OF CONTENTS

Description **Page**

TITLE PAGE……...i
ACKNOWLEDGEMENTS……...ii
ABSTRACT……..iii
TABLE OF CONTENTS……vi
LIST OF FIGURES……xii
LIST OF TABLES……xiii
LIST OF ACRONYMS AND ABBREVIATIONS……xiv
CHAPTER ONE: INTRODUCTION
1.1 Introduction……1
1.2 Motivation of the study……..2
1.3 Focus of the study……...3
1.4 Problem statement……3
1.5 Research Questions……4
1.6 Research objectives……...5
1.7 Background of the study……5
1.8 Limitations……... 6
1.9 Preliminary literature review……..6
1.10 Research Methodology……...7
1.11 The structure of the study……7
1.10 Summary……9
CHAPTER TWO: LITERATURE REVIEW
2.1 Introduction……10
2.2.1 Total Quality Management (TQM)……...10
2.2.1.1 History of TQM……..13
2.2.2 TQM as a Driver of Exceptional Services……13
2.2.2.1 Pareto quality analysis tool……15
2.2.3 Continuous improvement at academic libraries ……..16
2.2.4 Process re-engineering at the UKZN libraries……...18

2.2.5 TQM & Strategy ……..23
2.2.6 Define Measure Analyse Improve Control (DMAIC)…….....24
2.2.7 Block chain supply chain management ……..……...25
2.2.8 TQM Services for 21st century students ……27
2.2.9 E-learning ……..……....29
2.2.10 Technological changes ……..……...30
2.2.11 Resource constraints: Finances ……..……...31
2.2.12 Resource constraints: Skills ..……..34
2.2.13 Conclusion of literature review……..……..……..35
CHAPTER THREE: RESEARCH METHODOLOGY
3.1 Introduction……36
3.2 Research design…..……..…36
3.3 Research paradigm……..36
3.4 Research approach……..37
3.4.1 Quantitative research…….……....…37
3.4.2 Qualitative research…….……..……37
3.4.2.1 Observations……..……39
3.4.3 Mixed methods research……..39
3.5 Study settings……40
3.6 Population and sample of the study……40
3.7 Sampling method……..41
3.8 Construction of the instrument……42
3.9 Data collection…..……43
3.9.1 Primary data…...……..……..……43
3.9.1.1 Unstructured interviews……..43
3.9.1.2 Semi structured interviews…….44
3.9.2 Secondary data……..……...44
3.10 Administration of interviews……..……..44
3.11 Data analysis..…..……..44
3.12 Ethical considerations……45
3.13 Trustworthiness and rigor……..45

3.13.1 Credibility……..46
3.13.2 Transferability……..46
3.13.3 Dependability……46
3.13.4 Confirmability……47
3.14 Researcher bias: What types of bias were encountered? ……47
3.15 Conclusion ……..47
CHAPTER FOUR: PRESENTATION OF RESULTS
4.1 Introduction…….....48
4.2 Detailed analysis……..……..……48
4.2.1 Misalignment in procurement processes……..52
4.2.1.1 Unrevised processes……...…52
4.2.1.2 The Silo Effect..……..……..……52
4.2.1.3 The bullwhip effect……53
4.2.2 Budget constraints ……54
4.2.2.1 Information sharing regarding budgets……..54
4.2.2.2 Impact of journal cancellations……56
4.2.4.3 Funding as an impact factor……56
4.2.3 Technological changes……57
4.2.3.1 Cloud based library services……58
4.2.3.2 Digital library for digital students……..59
4.2.3.3 Techno-savvy personnel……..59
4.2.4 Embracing change through change management……60
4.2.4.1 Cost /benefit of change……60
4.2.4.2 Resistance to change……61
4.2.4.3 Instilling TQM and re-skilling of personnel……61
4.2.5 Library services ……62
4.2.5.1 Client satisfaction……..62
4.2.5.2 Radio frequency identification (RFID)……63
4.2.5.3 24hr services……..63
4.3 Conclusion……64
CHAPTER FIVE: DICUSSION OF RESULTS

5.1 Introduction……..….65
5.2. Process redesign for continuous improvement……...65
5.2.1 Managing ques……..……67
5.2.2 Backward vertical integration…….……..67
5.3 Information Technology……...68
5.3.1 Social media……...68
5.3.1.1 Mobile Instant Messaging (MIM)……69
5.3.2 4th Industrial Revolution……69
5.4 Client services……..70
5.4.1 24/h services……..70
5.4.2 Pre-request service……71
5.4.3 Expectation vs Perceptions……..71
5.5 Measuring service quality..……72
5.6 TQM & strategy……74
5.6.1 Enterprise Resource Planning (ERP)……75
5.6.2 Robust and accurate forecast……..75
5.6.3 Timing……..76
5.6.4 Costs to meet demand……..76
5.7 Change management……..77
5.7.1 Re-skilling of personnel……78
5.7.2 Kurt Lewin's model of change……..78
5.7.3 Innovative leadership……79
5.8 Budget Constraints……..79
5.9 Conclusion……81
CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS
6.1 Introduction……82
6.2 Summary of the study……..82
6.3 Key findings……83
6.3.1 What is the importance of understanding the procurement process of electronic resources? 84

6.3.2 How can change management support supply chain techniques?.....84

6.3.3 What are the challenges associated with shrinking budgets of library essential materials?.....84

6.3.4 What strategy is suitable to integrate supply chain processes to achieve a digital library?.....85

6.3.5 What skills are required in the library to embrace technological changes and improve services?.....85

6.4 Recommendations to solve the research problem……..86

6.4.1 Third Party Logistics (3PL) ……..86

6.4.2 Reverse logistics……...…87

6.4.3 Research & Development (R&D) ……..……87

6.4.4 Risk management…….89

6.4.5 Turn-aways……90

6.4.6 Triple bottom line reporting……..90

6.5 Implications of this Research……..90

6.6 Limitations of the Study……...91

6.8 Recommendations for Future Studies……..92

6.9 Conclusion…….92

REFERENCES……94

APPENDIX 1a: INFORMED CONSENT LETTER……..101

APPENDIX 1b: INFORMED CONSENT LETTER……..102

APPENDIX 2: INTERVIEW SCHEDULE……..103

APPENDIX 3: LANGUAGE EDITING LETTER……...104

APPENDIX 4: GATEKEEPER'S LETTER……...105

APPENDIX 5: LIBRARY CLIENT SATISFACTION SURVEY..……106

APPENDIX 6: ETHICAL LETTER……107

APPENDIX 7: TURNITIN REPORT……..……108

LIST OF FIGURES

Number	Descriptions	Page
2.1	Impact of TQM from supplier to customer	12
2.2	Eight Principles of TQM	14
2.3	Re-engineering methodology	18
2.4	Plan-Do-Check-Act (PDCA) Deming's cycle	20
2.5	Lean Principles	22
2.6	Deming's 14 Quality Principles	24
2.7	Procure-to-pay cycle	33
5.1	End-to-end supply chain flow	74

LIST OF TABLES

Number	Descriptions	Page
3.1	Advantages and Disadvantages of Qualitative Research…….	38
3.2	Demographics of study participants……	41
4.1	Formation of meaning and condensed meaning units……..	49
4.2	Illustration of sub-themes and themes……...	51
5.1	Pareto analysis of TQM Critical Success Factors…….....	72
5.2	Pareto analysis of service errors……..	73

LIST OF ACRONYMS AND ABBREVIATIONS

UKZN	University of KwaZulu-Natal
ICS	Information and Communication Services
PDCA	Plan-Do-Check-Act
NSFAS	National Student Financial Aid Scheme
UDW	University of Durban Westville
SERVQUAL	Service Quality
PAR	Participatory Action Research
EBP's	evidence-based practices
VUCA	Volatility, Uncertainty, Complexity, Ambiguity
IBM	International Business Machines
MCNY	Metropolitan College of New York
RFID	Radio Frequency Identification
CAPM	Comprehensive Access to Printed Material
QFD	Quality Function Deployment
LIBQUAL	Library Quality
RSS	Really Simple Syndication
HEI's	Higher Education Institutions
UK	United Kingdom
USA	United States of America
HR	Human Resources
TQM	Total Quality Management
E-content	Electronic Content

R1-R10	Respondent 1 to Respondent 10
OCLC	Online Computer Library Centre
WMS	World Share Management System
3PL	Third Party Logistics
MIM	Mobile Instant Messaging
PPV	Pay per View
R&D	Research and Development
APP	Application
RADAR	Radio Detection and Ranging
DFFS	Distance from Face Space
Wi-Fi	IEEE 802.11 x
QoS	Quality of Service
SLA’s	Service Level Agreements
PURCO	Purchasing Consortium Southern Africa
DNA	Deoxyribonucleic Acid
FMCG	Fast Moving Consumer Goods
IoT	Internet of Things
UIDs	Unique Identifiers
POC	Proof of Concept
IT	Information Technology
RMS	Risk Management Services
CMS	College Management Services
E-books	Electronic books

E-learning	Electronic learning
CCTV	Close Circuit Television
ISO	Organization for Standardization
DVD	Digital Versatile Disc
ILL	Inter Library Loan
CSF	Critical Success Factors
RIG	Research Interest Groups
CQI	Continuous Quality Improvement
ITS	Integrated Tertiary System
SAP	Systems, Applications and Product
KPI’s	Key Performance Indicators
PHD	Philosophiae Doctor
NRMSM	Nelson R. Mandela School of Medicine
US	United States

CHAPTER ONE

Introduction

1.1 Introduction

The historic method of monitoring the head count of users entering academic libraries is no longer valid, as institutions are now expected to disseminate information using efficient ways that do not require physical contact for users to be able to obtain information. The UKZN libraries consists of 104 staff members who service about 40,520 students enrolled with the institution (University of KwaZulu-Natal, 2018). That said, libraries have a role to play in managing the transition of accessing information online *vis-a-vis* having a collection that is accessible only through visiting the library. So far, the UKZN library has moderately adopted an electronic collection which comprises of e-books and electronic databases. To support this notion, Raju and Schoombee (2013) 29 argue that "Library as service focuses on the customer with the underpinning principle of "everywhere-you-are access".

While libraries try to adopt this phenomenon, Hoskins and Stilwell (2010) note that commercial publishers have monopolised the online databases and serials market with prices that increase annually and as a result, most institutions cannot cope with the constraints brought about by this overpricing of library materials. It is thus empirical to note that other industries address unstable budgets by introducing supply chain concepts and techniques suited to fast-track productivity, lean production, employ new robust methods to deal with financial changes and still not compromise on quality. Harvey and Green (1993) refer to quality as a standard or value measured against something of the same caliber to establish its degree of excellence. The UKZN library budgets have slowly increased from R32,000,000.00, R36,000,000.00, R38,500,000.00 and R52,008,000.00, during the years 2014, 2015, 2016 and 2017 respectively, consequently tampering with the level of its progress as far as quality is concerned (University of KwaZulu-Natal, 2018).

This phenomenon has forced academic libraries to compromise the services offered to its users by having journal cancellations every year without replacements or the switch

from print to online collection only. Many would argue that the methods that are used by production industries cannot be equally and successfully implemented in a service industry. The service industry in contrast requires the same attention as that of a production industry, as the aim of its existence is to satisfy the preferences of users and tailor make products and services according to their preferences. Galyani Moghaddam and Moballeghi (2008) confirm the importance of using Total Quality Management to ensure that the institution offers its users a service that is internally efficient and externally effective. Cheng and Zougmore (2018) 51 define efficiency saying, “Efficiency is the ability to avoid wasting materials, energy, efforts, money, and time in doing something or in producing a desired result. In a more general sense, it is the ability to do things well, successfully, and without waste”.

The purpose of this chapter is to expand on the research problem and explain the purpose of the study. A synopsis outlining the structure of each chapter will be discussed to provide an insight for the chapters to follow.

1.2 Motivation for the study

The study investigates the academic libraries of the University of KwaZulu-Natal (UKZN), consisting of five campuses naming which are, Nelson R. Mandela School of Medicine (NRMSM), Edgewood Campus, Howard College Campus, Westville Campus and Pietermaritzburg Campus located in both Durban and Pietermaritzburg. The libraries are mainly available to support teaching, learning and research at the institution. That depicted technological advancements may halt the services of the library, if not closely monitored. Thus, the study critically investigates measures to benchmark the services offered by other academic institutions in South Africa and beyond, with that of the UKZN libraries so that necessary improvements can be implemented. Furthermore, the aim is to improve the internal processes that may improve service offerings of the institution’s libraries. UKZN encourages every undergraduate student to own a laptop when enrolling at the institution, as means to embrace technological changes that comes with the rapid technological improvements around the globe. The most important question is whether the library is designed to accommodate such changes that come with these advancements in technology.

The National Student Financial Aid Scheme (NSFAS) is an organisation mandated to assist the financially needy students and is rolling out laptops to its beneficiaries, to support an e-learning curriculum at the institution. Libraries are an information repository in place to support such initiatives, promoting teaching, learning and research. Moreover, they serve as a tool to navigate users around the attainment of profound information that supports a major function of the university, a research led university of African scholarship. Facing the need to pilot the use of electronic devices to attain information, the UKZN library seems to be juggling between affording all the necessary resources required to have an e-library and the implementation of efficient techniques to improve quality in a fast-paced technology environment. To continually improve the services of the UKZN library, Total Quality Management (TQM) and process re-engineering have thus been identified as a tool to expedite change, considering the austerity driven environment in which the library operates.

1.3 Focus of the study

The purpose of this qualitative study is to critically investigate the ways in which to improve the Quality of Services (QoS) using Total Quality Management and process re-engineering techniques to fulfill user expectations at the UKZN libraries. The study aims to assist the management to be innovative enough to ensure that the libraries are strategically aligned, using forever shrinking budgets. The outcome from pursuing the aim of this study will elevate contribution from all the divisions of the institution, including the Information, Communication and Technology (ICT) division, the Human Resources (HR) and the Finance departments, which are at a focal point of transforming the library into a state-of-the-art information hub. There is a need to create a user-friendly space which can be easily navigated with minimal or no need for waiting to be served. Information that is available online can thus be accessed instantly, thereby solving problems of frustrated users who have deadlines of producing quality research and generating innovative ideas for the purposes of pioneering innovative leadership.

1.4 Problem statement

The gap exists between serving a 21st century student and unimproved facilities and services. One may argue that only income generating institutions must keep improving

service offerings and facilities, because the revenues depend on it. However, even the non-income generating service industry owes its client outstanding ambiance. Parallel to improving the services of the libraries is the technological changes issue which has greatly impacted on the funding received by universities. The budgets allocated to the UKZN libraries have drastically decreased over the years, hence, the needs of the students and all other users are not adequately met.

The academic library is the focal division of the university because it contributes to the overall performance of the institution in terms of rankings, researcher publishable units and research throughput. Every institution is dependent on the support provided by its library for quality teaching, learning and research. Expert skills are therefore essential to maintain this support. Remotely accessing information is a major concern, and students are well prepared to be part of the revolution, should the library be well equipped with the necessary tools to support online accessibility of resources. The transformation of the library can thus not happen in a vacuum, especially its readiness to accomplish an e-library. This means that the library itself must be abreast in terms of introducing innovative concepts and enhancing technology. This can thus be done by introducing techniques, including the TQM and process re-engineering, as a turnaround strategy for a digital library. In view of this, the study seeks to answer the following questions.

1.5 Research questions

- What is the importance of understanding the procurement process of electronic resources?
- How can change management support supply chain techniques?
- What are the challenges associated with shrinking budgets of library essential materials?
- Which strategy is suitable to integrate supply chain processes to achieve a digital library?
- What skills are required in the library to embrace technological changes and improve services?

1.6 Research objectives

- To assess the importance of understanding the procurement process of library electronic resources.
- To explore the ways in which change management can support supply chain techniques.
- To identify and describe the challenges associated with shrinking budgets of library essential materials.
- To identify and assess the best strategy to integrate supply chain processes to build a digital library.
- To establish and evaluate the skills understand skills required to improve library services through supply chain.

1.7 Background of the study

The research objectives of the study address the manifestation of a disconnect that exists in libraries' processes, systems or services that are not synergic with supply chain techniques. These techniques are popular in enhancing operations of an organization so that it stays relevant and lively. The models used by the library are to be relooked as means to re-engineer outdated procedures. This will allow for assessing a gap that exists between quality expectation and the quality perception of the users. Library procurement processes are partially understood by the finance and library departments, hence, the lack of the synergistic factor between the two divisions can cause confusion and delays and to a greater extent, financial loss. This has led to the disfavour of the acquiring process by its users as a non-reliable one. This misalignment is a ramification brought about by resistant staff who would rather operate with a traditional mindset instead of embracing new developments that suit user expectations.

Shrinking library budgets from year on year bring a dysfunction in meeting the objectives of the library and has a ripple effect of cancellations of important journals, which ultimately destabilises the research output, the core business of the institution. UKZN libraries are competing with other academic libraries which have transformed to be able to service digitally savvy clients. Likewise, the institution must employ strategies

that will incorporate supply chain functions to transition into a digital library. Lastly, skills may be an attribute that is far-fetched in terms of maintaining quality, however, the nature of the business of libraries calls for professional hard and soft skills to be competitive. These skills can be enforced in libraries by introducing continuous improvement functions to leverage competitiveness. It is thus arguable that supply chain is more effective in a manufacturing environment, as opposed to the service environment. Maintaining that theory, through workshops and trainings and skills development, the library is likely to stay abreast of technological changes, thus, continually improving its services. Moreover, benchmarking other libraries across the country may be the best tool to improve quality.

1.8 Limitations

The following limitations of the study were noted:

The study is focused on the adoption of techniques that may improve the quality offered by a university library. Therefore, students will not be interviewed as they are meant to be the recipients of the improved service. However, library management, in collaboration with the Information and Communication Services department and finance divisions, will be interrogated to source better ways to continuously keep abreast with the changes that may halt the service, be it internal or external factors. The limitation in proposing supply chain techniques including TQM emanate from the libraries' staff complement, which comprises professional librarians who are less knowledgeable about supply chain or ICT.

1.9 Preliminary literature review

Literature adopted concepts including TQM as well as processes re-engineering with which successful organizations use as means to revamp quality standards and for repurposing of space. Total Quality Management is described by Galyani Moghaddam and Moballeghi (2008) 912 saying, "Both a philosophy and a set of guiding principles that represent the foundations of a continuously improving organization. It is the application of qualitative methods and human resources to improve all the processes within an organization and exceed customer needs now and in the future".

1.10 Research methodology

This study employed the qualitative research approach. Qualitative methodology was more suitable for the study, as compared to the quantitative research, because the researcher gets to deal directly with stakeholders involved in formulating and implementing or improving processes pertaining to the phenomena being investigated. The quantitative research approach instead deals with explanatory findings based on numerical data which is analysed statistically. The interpretation from data collected from various sources determine whether what is observed might be explained by an existing concept. Qualitative research, on the other hand, relies on text and image data, it involves face to face, group or telephonic interviews with participants. The interviews are conducted using semi-structured and open-ended questions that are intended to elicit views from participants.

1.11 The structure of the study

The study was initiated with an approach that allowed a clear underpinning of the problem being studied. It was supported by an academic background, as well as a review of literature. An exploratory style of the methodology was utilised and the presentation and examination of information followed by ending recommendations and interpretations was done. The study is structured according to the following format:

Chapter One

This chapter comprises the background, aim and the problem under study. It presents the rationale for conducting the study. The need to answer research questions is outlined and it addresses a research problem with the aim of fulfilling the objectives of the study. The research methodology used is outlined, it also informs limitations of the study.

Chapter Two

Chapter two unpacks the literature review of the study. The purpose of the literature review is to research scholarly articles and all that exists pertaining to the topic, as well as the problem statement. The aim is to examine how the study contributes to the larger body of knowledge. Some of the pertinent issues discussed in the chapter include the

procure-to-pay cycle, block chain supply chain, lean principles and managing quality services.

Chapter Three

Chapter three provides the methodology used in the study. The choice of methodology used is determined by what the study's problem statement and purpose statement demands. This chapter sketches the sampling techniques, and research instrument utilised to collect the data from participants, as well as the methods of data examination.

Chapter Four

Chapter four brings forth the findings deriving from the interviews that were conducted with the respondents during the study, together with the results. Respondents included ordinary staff and key senior staff of the University of KwaZulu-Natal libraries. Facts gained from data collected are stated in this chapter.

Chapter Five

Chapter five brings a deliberation, as well as the explanation of the research results of the study. The outcomes of the study are also compared with results of past related studies. Discussions and views of the researcher are captured in this chapter.

Chapter Six

Chapter six links the concepts of the study with its findings. A detailed outline of whether the research questions have been answered is given in this chapter. It also offers a list of validation that shows how the research questions have been answered. Furthermore, it also reflects on how the identified recipients will benefit from the conclusions of the study. Recommendations on how to address the study problem are provided, a summary of the limitations identified, and resolutions on how to overcome boundaries identified are offered. This chapter also provides a brief outline stating whether the study answered and solved the research questions or not.

1.12 Summary

This chapter provided the overview of the study, outlining its background, aim, problem statement and the research objectives and questions. Also highlighted are the limitations of the study. The following chapter shows a link of the study and the worldview through other scholars on the same subject matter.

CHAPTER TWO

Literature Review

2.1 Introduction

This chapter provides an overview of TQM initiatives in academic libraries and it details what the UKZN Libraries have implemented to continually improve services. The chapter points out quality improvements in the library sector, locally and abroad especially, technological changes and innovation in an academic sphere. Lastly, the literature review chapter looks at change management, seamless processes of procuring library materials, and cancellation of materials due to shrinking budgets as the underpinning theory of the study. Where appropriate, the work is studied at an international viewpoint, to the African situation and finally, to the South African context.

This section will zoom into the UKZN libraries' way of operating, both modern and traditional. Furthermore, the continuous improvement measures in place to stay abreast with technological advancements already implemented by other academic libraries, and the nature of the community being served by the library will be explored. The role of the library in the context of research throughput will be highlighted, as well as the challenges facing the academic libraries, as well as the UKZN libraries.

2.2 The literature review

2.2.1 Total Quality Management (TQM)

According to Forker et al. (1997), TQM activities and practices in an organisation correlate with a positive performance, therefore, TQM is defined as an integrated system used by management to improve service and product offerings by simply streamlining business models, principles and procedures. Hwarng (1999) alluded to the concept of TQM, its positive reception by academic institutions around the globe and its satisfactory performance. Total quality management is a trend used by management to foster the development of the entire corporation by means of instilling a customer orientated culture (Arthur, 1994). Different authors define TQM in many ways, however, the essence of the definition carries a common element of being customer centric,

management's commitment, as well as administration of cultural and organisational changes.

Arthur (1994) reveal that among the many programs supporting TQM at academic libraries, staff training has been at the forefront, as the staff is more interested in learning how to positively fulfill users' expectations by firstly understanding and associating with their needs. However, Wrigley (1994) 337 opposes this notion, saying that "The literature on quality management is growing, though the application of TQM in the library environment is sparsely represented". In contrast, Jurow and Barnard (2013) state that TQM has grown rapidly in interest to executives and decision-makers in British higher education as a supply chain management technique.

Additionally, Jurow and Barnard (2013) give an overview of TQM's essential components, touching on teamwork, continually improving of services, systems and processes, customer focus, cost efficiency and quality measurement as the core elements to maintaining high quality standards, as illustrated in Figure 2.1.

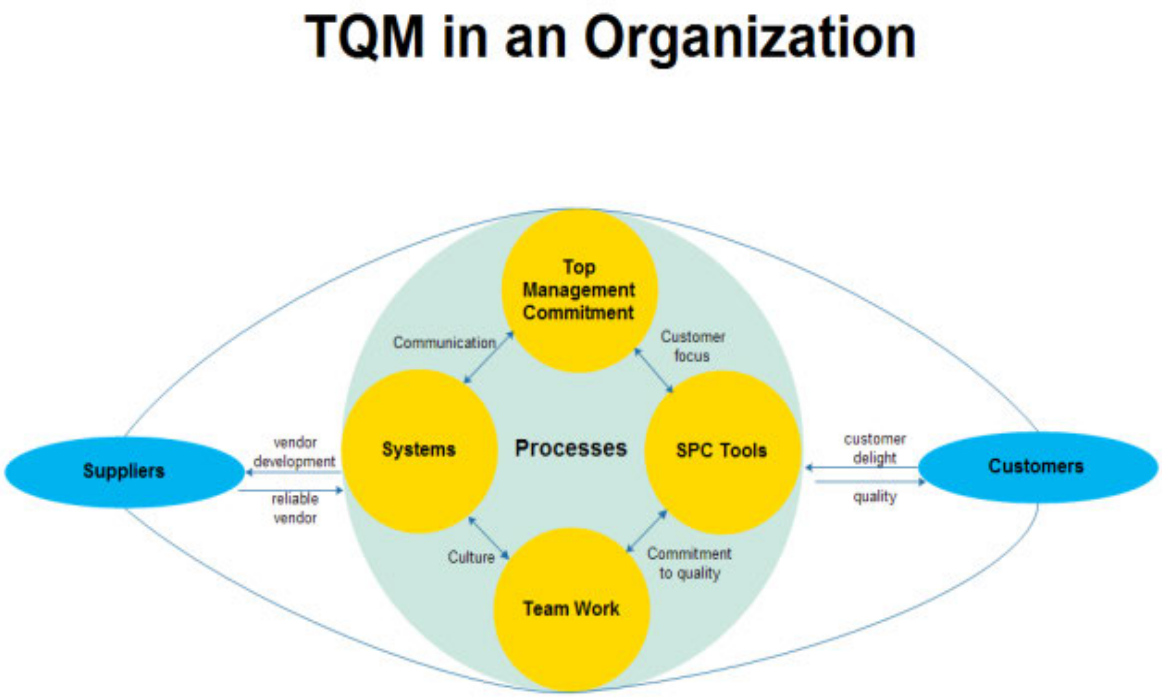


Figure 2.1: Impact of TQM from supplier to customer

Source: Adopted from edrawsoft

Figure 2.1 symbolises the role of management in integrating systems to continually improve services, while filtering that mindset down to the rest of the team. The rationale of TQM in an organisation is to involve the upstream tier three suppliers, as well as downstream tier three customers in decision making and process formulation. Ismail Salaheldin (2009) reveal that there have been many attempts to measure the effectiveness of TQM against organisational performance. Thus, it is essential to measure the impact of TQM on operational and quality performance of an organisation, as it serves as a good tool to identify areas that require improvement.

2.2.1.1 History of TQM

Galyani Moghaddam and Moballeghi (2008) reveal the history of TQM, explaining that *"The concept of quality management originated in Japan and later moved into the USA and the UK, initially in the manufacturing sector. Since then, the theory of quality management has been growing fast. It has become a management philosophy and has taken shape in a series of international standards in the ISO 9000 series. The philosophy is increasingly being applied in the service sector, including libraries".*

Dahlgaard and Mi Dahlgaard-Park (2006) confirm the history of TQM, tracing it back to Japanese, with Toyota being the pioneer of the philosophy and principles dating back in the 1950's. Though the inception of this integrated system called TQM mirrors back to the manufacturing sector, with Kanji et al. (1999a) adding that its success in the business environment encourages Higher Education Institutions (HEI's) in the United States (US) to adopt its principles. TQM has been in existence for over a decade since it was set forth by Edward Deming and is qualified by some authors to have brought effectiveness in organisations. The core philosophies of this integrated system involve the creation of supplier corporation, the employment of cross-functional teams, rather than silos and in depth identification of user requirements and satisfaction (Hackman and Wageman, 1995). Under the umbrella of TQM exists customer driven method of identifying opportunities, synchronising of work, waste management and continuous improvement. Lozier and Teeter (1996) reveal that in America the early adopters of TQM in pursuit of quality improvements were higher education institutions such as community and technical college.

2.2.2 TQM as a driver of exceptional services

Different industries have different ways of analysing quality in relation to their core business. That said conceptualizations of quality can vary from exception to perfection, to fitness for purpose, to value for money and transformation depending on the process and outcome set by an organisation. Higher education institutions are not exempted from applying different approaches to quality to understand and respond to the needs of the stakeholders (Harvey and Green, 1993). The manufacturing industry define quality as a measure of excellence, a level of being free from defects, deficiencies and

significant discrepancies. Total quality is informed by strict and constant commitment to certain standards that achieve uniformity of a product in order to satisfy specific customer or user requirements and maintaining the reputation of the organization (Antony, 2006).

Eight principles of TQM allow for an organization-wide employee involvement in securing a long-term success of any kind of an organization or sector as demonstrated in Figure 2.2 below.

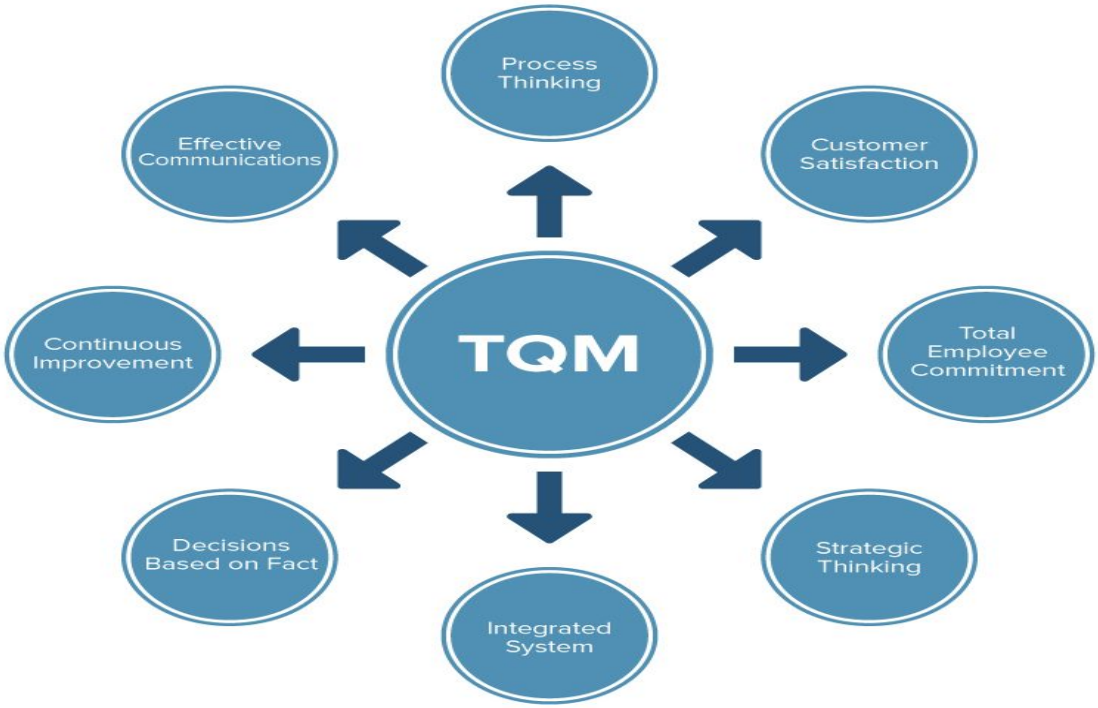


Figure 2.2: Eight Principles of TQM

Source: Smartsheet, 2018

Figure 2.2 displays the need for academic libraries to respond swiftly to the expectations of users, maintenance of consistency in performance of staff and processes, to invest in understanding the user's preferences and to offer physical facilities of a high caliber. Amongst the challenges cited in service improvement of libraries was that of financial distress. TQM principles alludes to focusing on decision making based on facts, however shrinking budgets are treated as a fallacy by many

higher education institutions hence manifestation of the crises. Higher learning institutions have weakest implementation of TQM, however, the United States (US) higher learning institutions have a history of successful TQM implementations supporting critical areas of research (Kanji et al., 1999b). Moreover, according to Sherr and Gregory Lozier (1991) 358 as cited by Kanji et al. (1999a) an interrelationship between values of HEI's and the principles of TQM: "many management techniques have made their way into higher education and failed, for example management-by-objective. However, they believe that TQM has a better chance than any other management concept for success in higher education because their values are more compatible with TQM principles". Another factor was the ideology that the success of the library is measured by the collection the library acquired. As much as that had been the norm, the rapid changes brought about by the economic and technological changes require strategic alignment of service expectations and perceptions of the library users (Kachoka and Hoskins, 2009). Some institutions have adopted Quality Function Deployment (QFD) as a methodology for improving and maintaining quality of products and services while Kanji et al. (1999b) unpack that TQM application in the US higher education institutions which began in the mid-1980s, was encouraged by its success stories in the country's industries around the same period. These attributes are somewhat an answer to how an organisation can best deliver high quality products and services to the end users (Hwarng, 1999). Quality is the determinant of the success or failure of most corporations, hence, it should be well maintained and advanced.

2.2.2.1 Pareto quality analysis tool

A Pareto analysis is a technique also known as the 80/20 principle, meaning 80% of an entity's progress or revenue comes from 20% of its products and services or 80% of problems encountered is caused by 20% of issues thus, the frequency of occurrences equate to 100 per cent (Talib et al., 2010). The Pareto analysis is based on a premise according to Hartman (2001) 120), who noted that,

"The tallest bar is always on the left and the shortest on the right. Pareto diagrams are based on the principle of separating the ***vital few*** *from the* ***trivial many****. This Pareto*

principle was developed by Joseph Juran, based on the work of Italian economist Vilfredo Pareto (1848-1923)".

A pareto is a quality analysis tool used as a quality measure which identifies the critical success factors and the service errors that impact the quality of the services offered in an organization by sorting these factors in a descending order given the frequency of occurrences. It is a popular tool that measures services quality in the service sector (Mahboob et al., 2015).

SERVQUAL and LIBQUAL are amongst the measures of quality in some academic libraries, singling out the Chancellor College Library at the University of Malawi. According to Lorie et al. (2003) 2:

"The LibQUAL+ methodology is a total market survey of user perceptions measured against minimum and desired expectations; the tool is grounded in the research library environment and the methodology provides a framework for identifying gaps in service delivery".

2.2.3 Continuous improvement at academic libraries

Continuous improvement is defined by Fryer et al. (2007) as a gradual, never-ending change by organisations aimed at increasing effectiveness and efficiency to fulfill its policies and objectives. Continuous improvement, also known as "*kaizen"* is not limited only to business strategy, customers, employees and supplier relations, however, it is the continual improvement of the entire system, including business processes. Simply put, continuous improvement refers to initiatives involving maintaining quality by improving processes and working together to make significant improvements without huge investments and saving costs where possible. TQM provides tools and direction used to improve quality. Jayamalini (1999) emphasises the need for continually improving quality by libraries, citing the increment in competition and high user expectations. Though not despising the positive outcomes of continuous improvement practices, Prajogo (2004) assert that its activities are implemented, in a manner that leads to most programs becoming self-limiting. Furthermore, Harari (1997) 37 agree saying, "obsessing internally until one achieves a zero-defects "do-it-right-first-time"

routine is a dangerous luxury that often slows down new breakthrough development in products and services".

As a means to continually improve services, the South African Medical libraries, including the UKZN's Medical library, welcomed the introduction of Problem-Based-Learning established to make available facilities conducive to offer an improved learning process, enhance interaction skills with the patients (Hines and Hines, 2012). It is thus crucial to investigate whether the curriculum is benefiting the academic libraries in shaping the way information is disseminated to students, as well as the reception from the students' end thereof.

Furthermore, academic libraries adopted the use of library 2.0 functionalities which serves as a link to sustain the communication with users using library website, blogs, RSS feed, podcasts etc. It is well-known that the merger of the former university of Natal with University of Durban Westville (UDW) had the institution working independently according to historical research, the library struggled to come up with ideas and strategies to share. Consequently, according to Steinerova (2007), over the years, there has been a significant shift in terms of libraries' role of being an information repository to being a virtual storage of information which supports digital age functions.

While the study aims to qualify continually improving library services using TQM, Kachoka and Hoskins (2009) allude to the fact that libraries used different models to assess quality of the services offered, including the excellence model, TQM as well as the balance scorecard. Wang (2006) 607 explain that: "Simply defined, TQM is a system of continuous improvement employing participative management and centered on the needs of customers" One may evaluate how affective has the implementation of these different models been. The most important factor therefore is the understanding of the extent of continuous improvement. Bessant and Caffyn (1997) define continuous improvement as continually fixing or improving something even though it is not broken. Jayamalini (1999) 11 refer to the adoption of TQM by academic libraries saying,

"Academic libraries are following different approaches in their TQM process. Some academic libraries are undertaking TQM or CQI (continuous quality improvement) as a library-wide effort address established library procedures on a step-by-step basis".

2.2.4 Process re-engineering at the UKZN libraries

Nozero and Vaughan (2000) 416 define process re-engineering, revealing that,

"Re-engineering is the process of radical change in organizational structure, business processes and delivery systems to achieve substantial improvements in service and value to the customer."

It essentially identifies processes which no longer add value to customer service, therefore, institutions are required to increase efficiency by revisiting and redesigning processes for the continuance of the quality services.

Figure 2.3: Re-engineering methodology

Source: Big Auk Technologies

Figure 2.3 illustrates a clockwise method into addressing an overarching model of the corporation to assess the relevance and significance of its processes. For institutions, requiring and maintaining high quality standards in terms of performance, agility, innovation and process re-engineering, is inevitable. Organisations are susceptible to technological changes, economic pressures and volatility impacts, hence, from time to time, this clockwise solution can curb uncertainty and failure. It is unsafe to generalise and assume that all students are satisfied with the pace of digital collection, information retrieval and the quality of services received from the UKZN libraries. Thus, management has a crucial role to scrutinise, as a means to redesign the existing processes, their impact on quality standards, and performance of the libraries and the institution in its totality. Hackman and Wageman (1995) appraise the importance of analyzing processes, as it is far rewarding than the cost that comes with inefficiency in processes.

Christensen et al. (1995) deliberate on the importance of organisational modeling, as it assists in focusing the practices to a direction that gains an institution a differentiation suitable to make it thrive. Furthermore, it is essential that while acting on addressing ailing service undertones, management also pilot continuous improvement models like the Deming's plan, do, check act (PDCA) quality approach. This quality model is a four-step cycle that can improve and maintain high quality standards, tier 3 suppliers are also part of the potential transformation sought. PDCA is a collaborative management way of continually improving systems and maintaining quality control regarded as a model for development (Moen and Norman, 2006).

Sahno and Shevtshenko (2014) unpack other techniques collectively used worldwide by organisations for continuous improvement purposes. These include use of the PDCA, 8 Disciplines (8D), Six Sigma, DMAIC, 4 Quadrants (4Q) etc. That explained, Shah and Ward (2007) 58 describes Six sigma as a supply chain technique that supports continuous improvement saying, "Six-sigma is a technique which advocates the attainment and improvement of quality of processed output by identifying and removing the root causes of defects and minimizing variability in the manufacturing and business strategy. It uses a set of quality management and statistical methods to get the maximum user satisfaction. It is a process in which 99.99966% of the products

manufactured are statistically perfect to be delivered which comes out to be 3.4 defects per million". Antony (2004) attest to the limitations of six sigma in that it solutions can be expensive thus resulting in some of them not being implemented. In the context of an academic library noting this is pivotal as the common crises of lack of finances exists. Dan and Filip (2016) mention that the 8D follows the logic of the PDCA cycle. The illustration in Figure 2.4 demonstrates the importance of continually evaluating processes to establish their relevance in a revolving business environment.

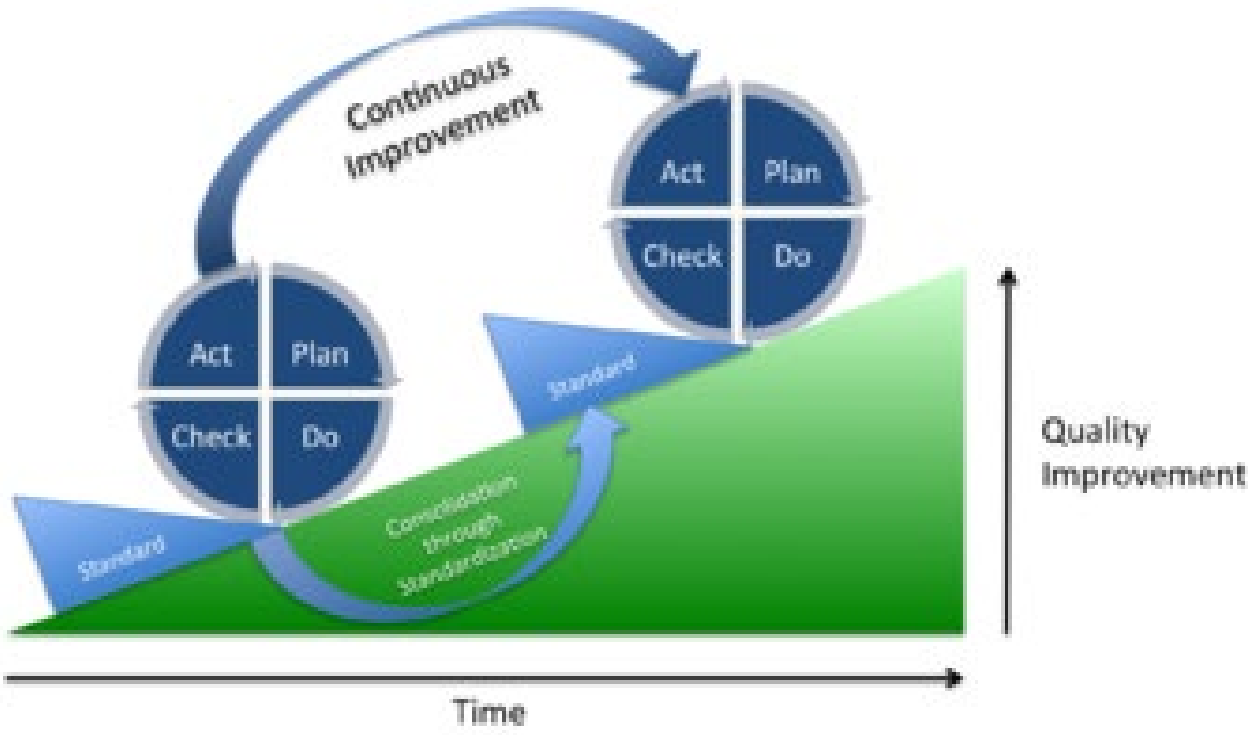


Figure 2.4: Continuous quality improvement with Plan-Do-Check-Act (PDCA) Deming's cycle

Source: Adapted from Johannes Vietze (2013)

Figure 2.4 depicts the significance of continually improving processes using Deming's cycle principle. This four-step approach to improving quality does not cost much, yet it yields great benefits to the institutions. While acknowledging undeniable advantages of the PDCA, Harari (1997) assert of the dangers of mastery due to routinisation which

may lead to stickiness that may cause lack of improvement in processes, as well as lack of awareness of the threats from the external environment of the organisation. It always ties the objectives back to the vision and mission of the unit, consequently enabling the implementation of new developments necessary in a hastily paced and changing environments.

Plan - Planning allows for defining expectations, resource requirements, identifying methods of measurements and potential barriers. The planning and doing elements of the PDCA cater for customer requirements and expectations, while the checking and acting part addresses user satisfaction or feedback. Other aspects incorporated at this stage include managing risk, technical development and strategic development, among the few.

Do - The “do” aspect of the PDCA comprises the performance of analysis regarding the relevance of the existing processes. Supply chain techniques offer a synergistic approach achieved by adopting lean manufacturing, six-sigma, just-in-time (JIT) or “jidoka”. All these concepts emanate from the Japanese, the inventors of continuous improvement across various sectors in the quest for gaining competitive advantage (Taylor et al., 2015).

Check - After the findings have been reported from the previous step, this step allows for risk determination, which is an important measure as it carries cost implications, if not thoroughly scrutinised, and the credibility of the organisation depends on it to a certain extent. Proper controls after detecting risk can be applied on the following step, ensuring that all improvements as a result of an exercise, are effective.

Act - Finally, this stage consists of the measures of dealing with the detected risk. It is thus expected that management acts after the first three steps have been undertaken to standardise processes and to continually improve them. The PDCA approach that supports process re-engineering is not a once off occurrence, therefore, organisations that want to maintain a certain level of quality must constantly revisit those processes using this concept to achieve the set quality standards.

This can be done in correlation with lean principles benefits in Figure 2.2.

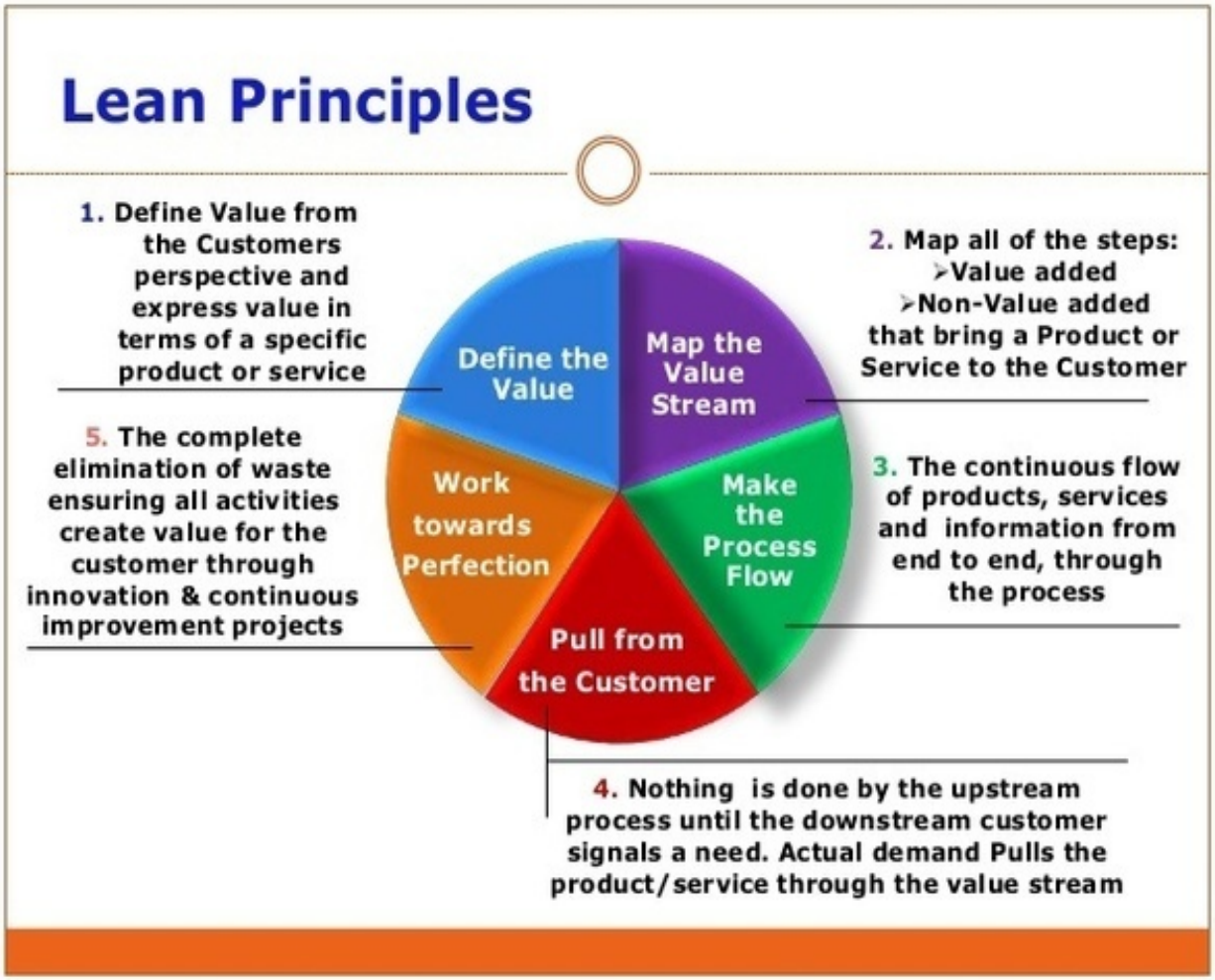


Figure 2.5 Lean Principles

Source: Quora, 2018

Lean principles provide an insight that maintains that the demand by customers triggers the provision of goods and services in all levels of business. Libraries offer support to the university, the university is an incubator that drives innovation by the nature of its services, which are key to the development of the country. The necessity of education has thus resulted in the existence of academic institutions, which mainly rely on third stream income to function. Lean principles are thus in place for directing activities to the precise needs of the users as a means to fully utilise the available resources with minimal or no waste, as an effect of non-value, adding activities that may be unconsciously entertained.

The continuous improvement school of thought insists it is costly to fix what is broken, than investing on improving it before it is broken. Hence, libraries can use the TQM concepts while saving on costs using lean thinking. Figure 2.2 outline one strategy of redefining processes to achieve quality using lean principles, summed up by a contribution from management's review of value adding and non-value adding activities, customer preferences, innovativeness and quality assurance. Lean six-sigma collaborate waste management and root cause identification, as a result providing tools, tactics to the reduction of inefficiencies that may halt the quality of services or products. The defect identification in processes allow for proliferated improvements in high quality standards, costs, customer fulfilment, speedy and accurate processes (Murphy, 2009).

2.2.5 TQM and strategy

Wang (2006) points out that there must be substantial theoretical experiment and implementations of TQM in academic libraries due to the widespread of changes resulting from the development of the economy and technological advancements. That said, TQM requires that the top management of corporations, including that of academic libraries, maintain high quality standards of the libraries by filtering continuous improvement down to all functions performed by all staff members. Furthermore, Wang (2006) emphasises the importance that continually improving functions should be centered at satisfying users' expectations in the main. Dr. W

Edward Deming, the “Godfather” of TQM, suggested fourteen points which are core of the TQM philosophy, as illustrated in Figure 2.2.

Figure 2.6: Deming’s 14 Quality Principles

Source: Adopted from ASQ

The illustration in Figure 2.2 depicts principles guarding against obsolescence and accordingly promoting total quality. The TQM philosophy aims to maintain efficiency and effectiveness, thereby lowering operating costs and maximising the market share. The fourteen principles embedded in the TQM philosophy allows for consistency in the improvement of quality products and services, plan for long-term quality provision and aims at constantly and continuously improving as a means to stay competitive and relevant.

As simple as the formulation and implementation of TQM may sound, scholars including Yusof and Aspinwall (2000) argue that the complexity of TQM activities make it rather not easy to implement, as it involves the whole organisational culture and the staff complement. Moreover, management tends to think that TQM can be incorporated in the existing system of the organisation, yet a new system must be a new way of driving strategy, whereby a new culture is adopted, improvements are continuous, and management is proactive rather than reactive, even with the mindset being concentrated more on quality.

2.2.6 Define, Measure, Analyse, Improve Control (DMAIC)

The TQM improvements are derived from more than just one methodology, as supply chain’s six sigma introduced PDCA, DMAIC and Radio Detection and Ranging (RADAR), Distance from Face Space (DFFS) and Define, Measure, Analyse, Design, Verify (DMADV) which are models used for quality improvement. DMADV differs from DMAIC in that it applies to a product or process that is not in existence yet Dahlgaard and Mi Dahlgaard-Park (2006) . DMAIC is unpacked hereunder:

Define - allows for defining that provides for a platform to describe the problem, outline the improvement activities and identifies improvement opportunities. Furthermore, at this stage, the project goals are stipulated in line with customer requirements.

Measure - process performance guided by objectives set, and Key Performance Indicators (KPI's) that inform the success of the new processes or project. At this stage, a visual demonstration of whether KPI's are attainable and on track to achieve goals as set in the defining stage.

Analyse - the process to determine the root causes of variation, poor performance (defects). Knowledge is not understanding, thus, it is essential to analyse with an aim of understanding the source of a problem to establish a suitable process or strategy to deal with poor performance of a product or service.

Improve - high-tech know-how can be applied at this stage to process performance by addressing and eliminating the root causes to improve the current state of processes.

Control – as a means to maintain the improved process and future process performance, it is essential to monitor the newly implemented changes to track potential threats and challenges that could be a setback to the operations.

Though, it is the task of management to relook at processes and revisit the approach pertaining to strategic decision-making, considering the Volatility, Uncertainty, Complexity, Ambiguity (VUCA) an organisation is operating within. Universities are not exempted from changes in the economic factors that lead to great financial stressors that interfere with the progress and future of organisations. Library management must thus design strategies for agility in an age of disruption, brought forth by effects of labour costs, taxes, macro environment, government policy, interest rates and management.

Kanji et al. (1999a) endorsed the role of TQM, referring to how it has successfully cushioned operations of businesses including Texas Instruments, Xerox and IBM, against external environmental factors and global competition. It is also essential that strategic decisions lean more on quality and service delivery, among other important factors, yet most organisations undermine the role of change management and process

re-engineering, as outlined in Figure 2.3. These can be employed alongside TQM for the betterment of the organisation.

2.2.7 Block chain supply chain management

Supply chain management has introduced strategies that accelerate continuous improvement in organisations. These strategies include the capability to do better by using less, promoting sustainability and venturing into seamless technology in the name of maintaining high functionality. Apte and Petrovsky (2016) describe block chain technology as the digital record of transactions which cannot be falsified due to a secure technology trust embedded in it, though highly adopted by many industries, including Fast Moving Consumer Goods (FMCG), and to some extent service industry's insurance companies, to mention the few. With an exception of the academic libraries in the latter, the tool allows for tracking of goods, digital ownership verification, and advanced workflow management. At the peak of saving costs, block chain eliminates intermediaries and ensures transparency by validating transactions. This integration of supply chain is essential because it is in the same mode of stimulating procure to pay transactions that significantly reduce fraud and any act that leads to counterfeit goods or poor services.

That explained, the internet of things (IoT) system of interconnected computing devices, including mechanical and digital machines, objects, software sensors that are provided with unique identifiers (UIDs), enables transfer, collection and exchange of data over a network without human-to-human to the very least human-to-computer dealings required. Cloud integration offers cost-effective functionality, thus transitioning into an effective business model (Korpela et al., 2017). Information integrity was efficient, however, with the approaching fourth industrial revolution, the libraries must align themselves with block chain supply chain, which is a game changer in end-to-end supply of good and services.

2.2.8 Library services for the 21st century students

Lorie et al. (2003) reveal that there has been a great level of growth in the interest to convert to digital libraries at several academic institutions, archives and museums. Digital library programs normally encompass digital collections, accompanied by digital services. These essential tools enable access, retrieval, analysing of the collections etc. This development is in line with the escalating expectations from end users. An academic library, thus has a responsibility to maintain quality offered, lessening the frustration that can affect a 21st century student. In a perfect world, should unlimited resources be the norm, it would be likely to deliver a satisfactory level services expected to all users using supply chain management. Resource constraints emanating from budget limitations require a consideration as an area of priority. Subsequently, it is essential to evaluate the cost-benefit, as per the views of end users, with regards to the digital library services (Choudhury et al., 2002).

Jayamalini (1999) concur that libraries have always tried initiatives to improve services through a commitment to provide high quality services to its end users. That has been done by way of obtaining more resources, procuring more library materials including books and journals, and the repurposing of spaces, to an extent of moving to bigger premises in the name of improving quality. Jayamalini (1999), however, reveals that such an approach is not valid today. One of the up to date solutions to improve quality is providing access to the right information to the right end user at the right period. A thorough change in the approach therefore, should be based on user specification and satisfaction. TQM is once again echoed as an approach to be implemented to achieve total quality in today's libraries.

The University of KwaZulu-Natal has had challenges with keeping up with the technological needs of the students. The crises still exist in most university libraries. Previously, libraries were perceived as a facility with a dusty collection accumulated over years, manned by a not so cordial librarian at the front desk. The lack of adaptation to technology is not just affecting South Africa's higher learning institutions, but it cuts across the borders of Africa and beyond. According to Unagha (2009), the University of Nigeria is facing similar challenges, resulting from the lack of awareness from the

university administration, the huge intake of students accepted to study, with limited resources and proper facilities in place, not applying technological enhancements and pressure from competing service providers. Alluding to these shortcomings, further disposal of information is necessary, not only focusing on the academic curriculum, but also on the socio-economic and human relations issues.

With reference to the possibility of revamping a current library into a vehicle that delivers quality services to the users, Choudhury et al. (2002) suggest two concepts to be adopted by libraries, Comprehensive Access to Printed Material (CAPM) and Multi-Attribute Stated-Preference Methods. These two tools will not replace the existing design and purpose of the library, however, will assist in providing a deservingly accepted level of excellent quality to technologically driven patrons. CAPM is described by Choudhury et al. (2001) 2 as “The CAPM Project features the development and evaluation of an automated, robotic on-demand scanning system for materials at remote locations”. Lorie et al. (2003) confirm that the CAPM methodology essentially offers a framework for fast tracking the significance and progress of digital library services, as determined by preferences of the end users. It is thus important to note that although the methodology was initially designed for a specific project, it can be used commonly to evaluate preferences of the end users against library services.

As depicted, besides the quest for transforming into a digital setting, libraries are still purchasing printed library materials, which results in space being a huge challenge, as more space is getting used up. CAPM then allows for moving materials to off-site remote locations aimed to alleviate space pressures, patrons however miss the ability to browse remotely stored materials simultaneously. In contrast, Fischer and Easterly (1990) argue that e-content has superseded printed content, as the use of e-books, electronic journal and aggregated databases is increasing.

The drawback of not browsing information in real-time is corrected by use of the Multi-attribute, stated-preference method. Lorie et al. (2003) unpack the significant role played by Multi-attribute, stated-preference methods, revealing that it features choice experiments as a means to collect data and collate it for demonstrating end user preferences. The choice experiments are presented as surveys and subjects

demonstrate the services or features mostly preferred by users. Multi-attributes consequently distinguish the user alternatives. Though these tools are not directly linked to supply chain, their relevance to achieving superb library services is profound and can be discovered through the application of TQM and process re-engineering at the academic libraries.

2.2.9 E-Learning

Njenga and Fourie (2010) 199 refer to the empirical relevance of e-learning, saying that "The use of technology, and e-learning, in higher education is becoming increasingly popular". As much as e-learning is an institution wide development, libraries should support and encourage resources leaning to e-learning as well as adopt it as one of its roles. Libraries have got more than just one service to offer, however it is evident that the role of the library is undermined or reduced to a certain degree. Facilitation of e-learning is another area that is lacking. The institution shuts down during mass actions with the academic activities being suspended. The nature of the environment requires for contingency measures to be in place as and when required. Similarly, Kim and Bonk (2006) stress the importance of e-learning by Higher Education Institutions (HEI's), citing the fact that more and more institutions are embracing online education as the number of students enrolling online rises.

Furthermore, it is revealed that higher learning institutions are still trying to find ways to explore education supported by technology. This is done by discovering potential e-learning technologies, including, e-books, simulations, wikis, podcasts, electronic journal and blogs. That said, opinions about benefits of online education are however mixed, as it resonates with a possible budgetary retrenchment, among other areas of concern.

Knowledge management has been identified as another principle that can be used in a fast-changing environment of information. The libraries stance should be that of capturing the knowledge flow and organise it in a way that it is accessible for reuse anywhere via the use of the online platforms, rather than face to face interaction. The right manipulation of knowledge thus significantly contributes to the enhancement of

performance by the unit and improves services received by users (Mavodza and Ngulube, 2011).

2.2.10 Technological changes

Wang (2006) 35 argues that “There is a need for adaptation while keeping the libraries where they are and pushing them forward to the age full of social and technological changes”. That said, Dube and Ngulube (2012) unpack that some students are not fully equipped with the necessary skills to survive at a tertiary institution due to the lack of facilities or proper library orientation received at their previous schools. Students at the UKZN are exposed to large volumes of information in a form of print and online resources. This abundance of information may be rather confusing and misleading if navigation skills for sourcing, locating and retrieving relevant information are not used.

The UKZN libraries host user training sessions for all 1st year students as a means to allow a smooth transition from high school to tertiary curriculum and programs. Even so, De Boer et al. (2012b) states that it is significant for libraries not only to follow change, but instead, libraries need to anticipate, plan, lead and follow change, considering technological changes brought about by social trends, as well as the evolving library technology. The emphasis in this instance is made to the importance of grooming the library leadership and management with skills that fit the new scope of service and the technologically oriented lifestyle of users.

Wang (2006) reveals that to stay relevant, libraries should attract users’ interest for them, in the same fashion that businesses do. With a variety of sources of information services available via information technology, it is inevitable for libraries to lose their clientele, should the services not be tailored to address technological advancements, providing easy access to the content without delays. The emphasis is that factors including time, delays, ease of use, search efficiency etc, are the determinants to a great degree, when discussing the value of the service offered by the library.

The relationship between academic staff, librarians and the institution’s information, communication and technology departments, can play a crucial role in preparing students from diverse backgrounds to be experts of information retrieval, with the necessary resources in place. In 2010, the Medical School Library launched its first

self-checkout system which senses Radio Frequency Identification (RFID) tags to improve services offered to students perceived to have a heavy workload. Technological readiness also refers to continually training and up skilling staff and benchmarking as some of the success factors. As it were, a conservative mindset of management is inclined to keep the status quo. However, TQM can deliver a critical level of change and a paradigm shift, contributing to the future development of services. This can therefore be executed in practice, using continuous improvement (Wang, 2006).

Adding to that, Fischer and Easterly (1990) confirm the relevance and impact of financial deficiencies, citing that library content is overwhelmingly changing and this is driven by technology and budgets. The interest in print content is declining, as publishers are regarding e-content as a cost saving move, while vendors are discouraging content silos and investing in content integration to save costs. Notwithstanding the importance of having content that mirrors the future of a digital library, end users' ability to locate, access and retrieve content is critical. Consequently, the acknowledgement of financial state of libraries paired with embracing of technological improvements is likely to increase the usage and value of library services is realised across a range of resources.

2.2.11 Resource constraints: Finance

Among the challenges associated with poor quality at the academic libraries is that of inadequate funding by the budget holders. Notwithstanding the crucial core business of the university which is research output, it is important to support the mandate with the necessary skills and resources in the form of finance and facilities that address the volatility and the overall economic outlook. Mavodza and Ngulube (2011) 15 confirm the above notion with reference to the case study conducted at the Metropolitan College of New York (MCNY) saying, "All the teaching and learning at MCNY is highly dependent on library support".

Hoskins and Stilwell (2010) agree to the importance of having a sustainable library collection, however, challenges are brought about by commercial publishers who are

monopolising the academic publishing system by annually increasing journal or serial prices above the inflation rate. Academic libraries have a limited budget and cannot afford to maintain the journal or serials subscriptions which are overpriced. This is as a result a direct consequence of the ordeal in academic institutions. The crisis has consequently resulted in less scholarly resources available to researchers, compromising on the quality of research. Seth et al. (2006) argue that although service quality research is conducted, it is mainly focused on the consumer and less focus is given to the applicability of service quality, more essentially when looking at the supply chain context. The practicality viewpoint as compared to the library budget cuts has led to the problem of journal cancellations, which exists within, but not limited to the context of the South African university library.

Unagha (2009) points out that due to the diminishing supply of funds for valuable library materials, the managers should be strategic in selecting or investing in the collection that benefit and tallies with the expectations of a 21st century student. According to Hoskins and Stilwell (2010), the second most popular reason for journal cancellation is budget cuts, which comes after migration to online access. That outlined, Lorie et al. (2003) advice that the benefits of having a digital library should be determined by users and therefore, resource allocation should be at the top of the priorities list. Likewise, Hackman and Wageman (1995) support the premise of heavily investing in quality, instead of maintaining low costs, which is likely to cause the loss of credibility of the institution, poor quality service, as well as the loss of potential end users.

Procurement processes are better, yet another crucial area that requires high proficiency skills in that limited funds allocated to the library go a long mile by ensuring proper procurement policies and procedures are adhered to by the finance staff. The procurement of goods and services is backed by the procure-to-pay cycle, which is a strategy used to set and control targets. The cycle entails the steps to be followed from acquisition to concluding the payment. It is thus significant that the staff, transactional systems and information systems enabling involved in the procurement process adhere to the cycle (Racz et al., 2010). Figure 2.4 illustrates the flow of the integrated

procurement cycle that reduces the risks associated with discrepancies in the acquisition of goods and plans to obtain credibility to suppliers, as well as sealing service level agreements with potential vendors.

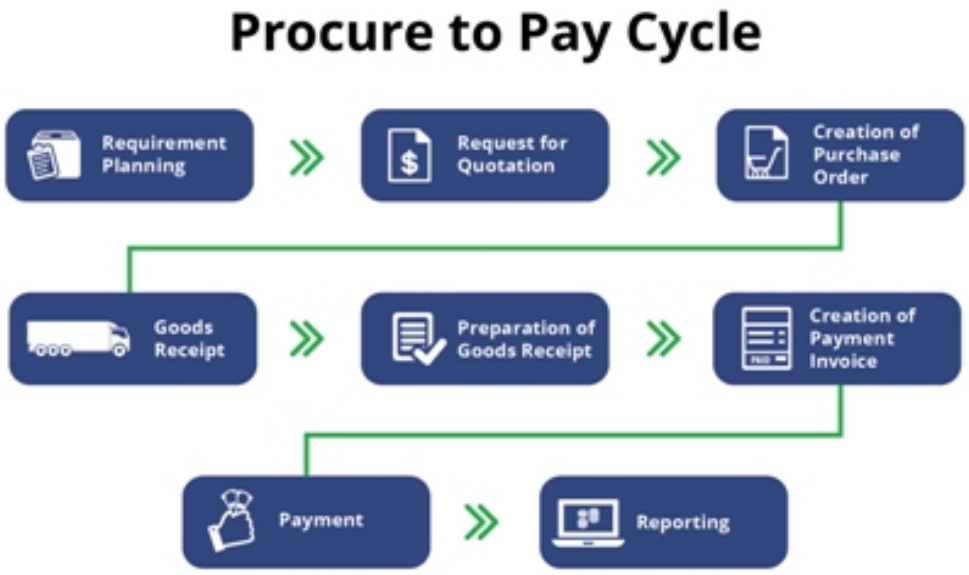


Figure 2.7: Procure-to-pay cycle
Source: Adapted from Invensis Global Outsourcing Services

Among the benefits of having a procure-to-pay cycle that is aligned to service offerings of the unit is that of guaranteed user satisfaction. Though the system is not directly linked to servicing users, however, it allows for proper managing of account payables, procurement management, material management, accounts receivables and general ledger components of Systems, Applications and Products (SAP). SAP enables for tracking of user and business interactions thus, it can be used an improvement tool to quality of services.

The goal of having unflawed procurement processes assists to obtain the right quality of service in the right quantities, at the right time, in the right place, from the right source, at the right costs and affords the right service, both before and after the sale. A procurement system of a successful organisation should therefore be fair, transparent, competitive, equitable and cost effective (Dachyar and Praharani, 2016).

2.2.12 Resource constraints: Skills

TQM can, to some extent, be added as a skill in the workplace. However, van Kemenade (2012) weighs in on the fact that the absence of TQM education at tertiary level of education causes the lack of understanding of its importance. Likewise, management being the overseers of institutional dynamics, are at the better position to filter down the mind-set that promotes TQM skills throughout the entire organisation. Beer (2003) 623 confirms that

"Failure to institutionalise TQM can be attributed to a gap between top management's rhetoric about their intentions for TQM and the reality of implementation in various subunits of the organisation. The gap varies from subunit to subunit due to the quality of management in each. By quality of management is meant the capacity of senior team to (1) develop commitment to the new TQM direction and behave and make decisions that are consistent with it, (2) develop the cross-functional mechanisms, leadership skills, and team culture needed for TQM implementation, and (3) create a climate of open dialogues about progress in the TQM transformation that will enable learning and further change".

To also ponder on the belief that TQM skills are often not incorporated in the skills required from servers put in place by an institution to satisfy and meet its stakeholders' expectations, soft skills are also a huge challenge for libraries, most importantly academic libraries. As per van Kemenade (2012), soft skills comprise, communication skills, team-based quality management initiatives more relevant to the service sector, rather than the manufacturing sector. These skills are significant in academic the libraries as they promote organisational culture, reciprocal flow of information between staff and patrons and can ultimately make or break the vision of the library. Notwithstanding the myth associated with a word "librarian" and "unfriendliness" librarianship must conform with the changing environment by adopting leadership, community outreach and communication of library value to users (Matteson et al., 2016).

2.2.13 Conclusion of literature review

This chapter established how corporations adopt TQM and other supply chain techniques and concepts to increase the growth and efficiency of their resources, in that huge profits are harvested. The significance of the literature reviewed demonstrates the role of TQM in an academic library context as an essential element to offering efficiency, quality services and user satisfaction. Investing in quality is far better than correcting a situation where quality standards have been tampered with, as it costs more. Hence, it is important for all the staff to understand the importance of how detrimental poor service is to the organisation, as well as how good service can reward the organisation in a long term.

Toyota pioneered in employing supply chain techniques to stay ahead of their competitors and most manufacturing organisations followed suite. Due to pressures brought by advancements in technology, the service sector also had to transition from the traditional manner of operations and venture into integrated processes in relevance with the community it serves. Since traditional management endorse hierarchical, vertically structured organizations, TQM seeks to build a culture of networking across and among functions, in that teams from different disciplines collectively devise solutions to problems. It can thus be maintained that TQM is organization centered. The following chapter underpins the methodology and design chosen to arrive at the crux of the research problem. The chapter outlines the location of the study, participants, data collection methods and ultimately, data analysis, backed up by the reliability and validity of the study.

CHAPTER THREE

Research Methodology

3.1 Introduction

This chapter focuses on the methodology chosen and the design used to underpin the study process, which entails the study settings, research design, paradigms and methods, population, sampling of the study and sample methods.

Welman et al. (2005) 2 elaborate that “Research is a process that involves obtaining scientific knowledge by means of various objective methods and procedures”. Creswell (2014) explains that research approaches stem from a process that outlines the steps to be followed, commencing from assumptions to detailed data collection methods, data analysis and results. The study employed the qualitative research method, since it aims to respond to the research problem by describing a phenomenon, situation or event.

3.2 Research design

According to Schurink (2009) a research design is a sketch of how one would like their research to be executed from identifying a gap, to formulating a research topic and ultimately interpreting the results of the study. Welman et al. (2005) argue that a research design is a plan to get research respondents from whom information will be collected. It outlines a step by step framework of what the participations will do to reach results that responds to the research question.

3.3 Research paradigm

Chilisa and Kawulich (2012) 1 state that, “A paradigm is a shared world view that represents the beliefs and values in a discipline and that guides how problems are solved” A paradigm as alluded to above, is established research traditions reflecting a world view about philosophical assumptions, it is linked to the social reality and interpretive in nature. It is well associated with the holistic system of thinking (Chilisa and Kawulich, 2012). A paradigm translated to a set of concepts in a subject area revealing their properties and the relationship between them called ontology. It is what is believed regarding reality of nature.

That explained, a paradigm thus leads us to probe certain questions and using suitable approaches to systematic inquiry referred to as methodology. Ontology relates to whether we believe there is one verifiable reality or whether there exist multiple, socially constructed realities (Patton, 2002). It can thus be concluded that epistemology enquires into the nature of knowledge and truth. This study adopted a social constructivism within an epistemological assumption as knowledge was created by people in conjunction to interactions with their environment. This was done using a deductive research approach.

3.4 Research approach

3.4.1 Quantitative research

Unlike qualitative research method, the quantitative research requires suitable statistical tools to test the hypothesis of the study. Thus, quantitative methodology uses experimental and non-experimental designs which are surveys. Bryman and Bell (2015) suggest that quantitative research design predominantly employs structured interviews and surveys in a form of questionnaires, while qualitative research employs unstructured interviews.

Quantitative research offers theories which must be disconfirmed using testable empirical verifications referred to as hypothesis (Bryman, 2016). This approach involves testing a hypothesis using a statistical tool, which provides a conclusion whether a hypothesis statement should be accepted or rejected based on the proof interpreted from conducting a study. Quantitative research test objective theories by examining relationships between variables. The variables can consequently be measured on instruments in that numbered data can be analysed using statistical procedures (Lutabingwa and Auriacombe, 2007).

3.4.2 Qualitative research

A set of research methods used to describe or explain a phenomenon is referred to qualitative research (Welman et al., 2005). It is exploratory in nature and commonly explores attitudes, opinions and aims to explore a subject with little prior knowledge and research. It surfaces issues to form basis for further research by exploring beliefs, perceptions, interactions, classroom structure, and actions in numerous sceneries.

Qualitative research mirrors a description of the phenomena under study. It conducts research by way of interviews, observations, and document analysis. Collected data is therefore analysed through systematically sorting and coding to establish themes across multiple data sources. Bryman (2016) refer qualitative research to a non-quantitative research which is analysed in a non-statistical way in that it is explored in terms of internal and external validities. While qualitative research is regarded as field research, it can be adopted by other approaches to compliment exploratory research and provide a deeper sense to a survey or experimental findings. A qualitative research is a naturalistic enquiry that enables the researcher to focus on natural occurrence of events and actions. The nature of the observation in this instance is told as is not according to the interpretation or understanding of the researcher (Auriacombe and Mouton, 2007). This study employed a naturalistic enquiry.

Table 3.1: Advantages and Disadvantages of Qualitative Research

Advantages of Qualitative Research	Disadvantages of Qualitative Research
• Direct observation • Unstructured interviewing • Natural field settings • Pertinent documents collected • Less structured data collection • Flexible, spontaneous and open-endedness • Detailed less distorted data • Methodological empathy	• It can be costly • Labour intensive • Structured questions • Not understood by classical researchers • Unavoidable researcher bias • Subjectivity results in procedural problems • Replicability is difficult • Difficult data interpretation and analysis

Source: Compiled by researcher

Qualitative studies do not make statements about whether a practice is evidence based. However, it provides essential information about the implementation of

evidence-based practices (EBPs), including critical components of EBPs seeking to analyse data using the viewpoint of a respondent. Creswell (1996) points out that the history of qualitative research originates from anthropology. Qualitative research method aims to launch out the socially construct paradigm of the nature of reality to assess the link between the research and the object analysis (Welman et al., 2005). Thus deciding on which approach to use is determined by different philosophies of knowledge and there is a link between the amount of control required of the investigator and the nature of subjects of the study, which are also a determinant of gathering, analysing and presenting information (Bryman, 2016) .

3.4.2.1 Observations

Observations form part of primary data collection in a qualitative study. The researcher is responsible for making observations during the data collection process. In a natural state, field researchers also use observations as a method to collect data besides that of conducting interviews and analysing documents. The researcher thus must play a certain role in order to successfully present the data collected from observations, with a choice among being a peripheral, an active, or a complete member's role. Four roles can be played by the researcher during data collection and they include, complete participant, participant-as-observer, observer-as-participants as well as complete observer (Polkinghorne, 2005). Observations were also used in this study to and interpret data collected and drawing findings.

3.4.3 Mixed methods research

Bryman and Bell (2015) note the significance of combining of the two approaches where the researcher uses qualitative data which is based on quantitative findings using unstructured data. Similarly, mixed methods design tends to integrate qualitative and quantitative data in a study (Creswell, 1996). A single research project that uses both a qualitative and quantitative research designs is referred to as a mixed method research. (Johnson et al., 2007) reveals that though mixed research method is regarded as one of the three paradigms, some authors tend to disagree with that school of thought.

3.5 Study setting

The researcher studied participants in their natural setting during face to face interviews. The study was conducted across UKZN libraries with a view of obtaining in-depth scope of processes and their relationship to TQM. The research setting was comfortable and suitable to both the participants and the researcher and did not interfere with the flow of their work.

3.6 Population and sample of the study

The population is the total unit of analysis encompassing individuals, groups, organisations, through which a researcher after data collection makes conclusions. Within a population is a subset of individuals included in the study called a sample. A sample has distinct elements including probability and non-probability (Creswell, 2014).

The sample thus comprised ten university staff. The staff represented all levels of management at the library division, including the Director, executive managers, junior managers and head of departments and other employees. The departments outside the library included in the population consisted of the ICS and Finance (procurement) departments. Table 3.1 portrays the sample used in data collection according the age of respondents, gender, qualifications and the department each respondent represented.

Table 3.2: Demographics of Study Participants

Participant Name	Age	Gender	Education Level	Ranking
R1	45	Female	Masters	Library Executive Management
R2	26	Male	Diploma	Circulation Desk
R3	32	Male	Masters	Research Finance
R4	50	Female	Post Graduate Diploma	Cataloguing
R5	46	Male	Bachelor's Degree	Client Services
R6	44	Male	Master's Degree	e-Resources
R7	52	Male	Bachelor's Degree	Acquisitions
R8	45	Male	Post graduate Diploma	Information & Communication Services
R9	48	Male	PHD	Library Information Services
R10	46	Female	PHD	Library Executive Management

Source: Compiled by researcher

Table 3.1 depicts demographics that formed part of the study.

3.7 Sampling method

Purposive sampling was employed. Purposive sampling is a non-probability form of sampling (Tansey, 2007). The goal of purposive sampling is to select cases and participants in a strategic way, so that those sampled are relevant to the research questions. According to Tongco (2007), purposive sampling technique is a type of non-probability sampling that is most effective when one needs to study a certain cultural domain with knowledgeable experts within. Purposive sampling may also be used with both qualitative and quantitative research techniques. Furthermore, a stratified random sampling used when sub-group distribution in population is retained in the sample will be used throughout the duration of the study. This is so that the key subgroup of the population is represented in the study consequently sourcing valuable information. The participants are permanent and one contract staff members consisting of library,

Information & Communication Services (ICS) and procurement divisions staff members. The library was represented by respondents in executive management, middle management and lower level management covering personnel from across all the sections including client services section, cataloguing department, acquisitions, e-resources unit and library information service.

This research project required for critical analysis of the library mandate and how it is delivered to users and recipients of services and the environment the libraries operate in. That stated, it was crucial to purposively select respondents who have a potential of contributing to the body of knowledge by offering valuable information on how the research problem could be addressed. Sampling was done out of the total of 104 library staff who represent all the five campus libraries: Edgewood, Pietermaritzburg, Westville, Howard and Medical library. Respondents were chosen because of their experience and in-depth knowledge which translates to the understanding of the environment the library operates in, as well as their understanding of users. The participants were of different gender and age groups and ethnic groups. This method of selection allowed for different views to be sourced without limiting the likelihood of solving the research problem. As a result, the selection of respondents among 104 library staff was based on their experience, role or area of specialty, age and length of service in the library environment. For the ICS and Finance departments, the selection of participants which is the managers of these respective departments was also made based on the hierarchical influence on library decision making and expertise. That said purposive sampling was used.

3.8 Construction of the instrument

The instrument used for collecting data was face-to-face recorded interviews. The research questions were structured in a manner that allows the respondents to expand, providing an in-depth view which unearths the root cause of the problem. A total of fourteen questions were asked and they were linked and formed sub-questions of the main research questions and objectives of the study. The reasons for asking such questions was to gain insights into the library's capacity to absorb supply chain

techniques to improve services, identification of setbacks halting the service offering, whether the rationale of decision making, technological changes and provision of access to library content relates to any integrated TQM systems. The questions further addressed the level of process re-engineering initiatives at the library, the role of each respondent to the structure of the library/university, it also addressed the staff members' need for change management, as well as reskilling.

3.9 Data collection

Data was collected using a primary data collection method. It was interactive, as face to face interviews were conducted. Creswell (2014) define interviews this way: "Interviewing is the collection of data by asking people questions and following up or probing their answers. Data collection methods will be discussed hereunder and the methods that applied to the study will be identified.

3.9.1. Primary data

According to Hox and Boeije (2005), primary data is used for a specific design to address its specific research question. Data collection involves the use of different collection strategies among which are, experiments and quasi-experiments supported by a research design that allow for casual inferences. The second form of data collection uses surveys which are conducted using structured questionnaires gathering large amounts of data from a large sample of respondents. And lastly, large data is collected in qualitative design from a small purposive sample by way of unstructured interviews, observations and focus groups. For purposes of a qualitative study interviews were conducted which formed part of collecting primary data. That explained, there are two methods of collecting data and a distinction is made between primary and secondary data. Primary data collection can take place in several types of interviews including: -

3.9.1.1Unstructured interviews

Dana et al. (2013) 512 explain that, "Unstructured interviews are a ubiquitous tool for making screening decisions despite a vast literature suggesting that they have little

validity". Alluding to that, unstructured interviews are unpredicted yet are said not to have deterred accuracy. However, these interviews relay the advantage over its predictive validity.

3.9.1.2 Semi-structured interviews

A semi-structured interview is as pre-planned dialogue whereby the interviewer interrogates an interviewee with the aim of soliciting answers to address the research problem (Longhurst, 2003). This research used semi-structured interviews as a means to collect in-depth data to underpin the phenomenon under study.

3.9.2 Secondary data

Hox and Boeije (2005) state that secondary data is information made available for use by other researchers like national and regional statistical agencies. However, unlike primary data, secondary data is somewhat difficult to evaluate in terms of its credibility and contribution to the quality of analysis and the overall research study. Library reports and newsletters were consulted to source secondary data for this study.

3.10 Administration of interviews

Interviews have a reputation for gathering in-depth quality data from respondents. They provide an examination and description of trends, occurrences, beliefs as well as a general view of a subset of a population by collecting primary data. This research project used face-to-face interviews which were conducted personally by the researcher.

3.11 Data analysis

Data analysis comes in a graphic, oral and written format. This textual language is read by the researcher with deep understanding to analyse and interpret into a meaningful content that portrays a profound insight. Recorded interviews were transcribed by means of verbatim for the research to get the gist of each component of data collected. This informed a decision for gathering data that was relevant to the researcher and collating it into themes using thematic coding. Thematic coding, also known as

conceptual coding, seeks to categorise data in its similarity and relevance under each perspective.

3.12 Ethical considerations

Prior to collecting data, the researcher obtained permission from the Library Director to conduct the study, attesting to the need of addressing setbacks and gaps which existed at the division. The Director's permission was followed by authorisation in a form of a gatekeeper's letter (APPENDIX 5) obtained from the institution's Registrar. The letter allowed the researcher to collect data and required to apply for ethical clearance to ensure that the study is not harmful to the human element and sticks within the ethical boundaries as possible.

The researcher applied and got approval for the ethical clearance (APPENDIX 3) from the UKZN research committee, granted on grounds that the research does not involve human contact in a manner that may be harmful or somewhat demeaning. During data collection an informed consent (APPENDIX 1a) was explained to each participant outlining its content, which is the aim of the study, research objectives and research questions. More details on the interview process, including the recording of the interviews, were explained and emphasis was made on anonymity and confidentially of the information gathered during and after the study. Each participant then signed the consent form (APPENDIX 1b) prior to participating in the interviews. The researcher further safeguarded the identity of the respondent by coding it with (R1-R10), instead of their authentic names, while analysing and presenting data. The participants' anonymity was paramount consequently avoiding collection of distorted information.

3.13 Trustworthiness

Qualitative research seeks to drill down to the factual phenomenon rather than in generalised and predicted viewpoint. Reliability of any qualitative research is measured by trustworthiness during the soliciting of information by researcher (Golafshani, 2003). Thus, rigor was built on the process throughout the undertaking of the study. The researcher was proactive in taking responsibility of ensuring that trustworthiness of the study was obtained, despite probing using the naturalistic inquiry to underpin the

phenomenon. Cope (2014) reveals that critics regard qualitative research as subjective and is usually linked to researcher bias and with nonexistence or minimal generalisability due to large detailed information collected. A qualitative research makes use of terms like credibility, transferability, confirmability and dependability discussed hereunder as the criteria for quality. Neutrality, consistency and applicability are also used to measure rigor in qualitative research. Krefting (1991) confirms that no same method can be used to measure quality, therefore, it is erroneous to measure a qualitative enquiry using reliability and validity.

3.13.1 Credibility

Cope (2014) explains that credibility is the truth in the data, the respondents' views and experiences and the interpretation into themes and representation of those views by the researcher. Krefting (1991) states that in credibility of the research, enough submersion should be sought to allow recurrent patterns and themes to be recognised and shown.

3.13.2 Transferability

According to Malterud (2001), the significance of sampling is somewhat linked to validity. There is a difference between internal and external validity. Internal validity enquires if the research investigates that which it is meant to investigate, while external validity looks at the context which the findings could be drawn. Thus, the study is meant to show the extent and degree of transferability drawing from research questions and the sampling strategy. Though, it is noted that no study can be totally transferable. Furthermore, transferability contains subjectivity that arise from the fact that the effect of the researcher is overlooked. In Chapter One, the background of the study described the context of the study, followed by the description of the theoretical framework in Chapter Two.

3.13.3 Dependability

Dependability refers to the extent to which the findings of the study can be imitated. It is more related to the term reliability used for quantitative research. A quality notion in

a qualitative study serves to generate understanding. Enquiry audit is also used to enhance dependability of a qualitative research to examine consistency (Golafshani, 2003).

3.13.4 Confirmability

Confirmability is a criterion for neutrality of the research. It is the extent to which the findings can establish truth value and applicability and be confirmed by another researcher. Confirmability is a strategy where an external auditor attempts to follow the natural background of events in a research project, as means to comprehend the reasoning behind decisions made and how those decisions were made.

3.14 Researcher bias: What types of bias were encountered?

Chenail (2011) highlight that qualitative research popularly faces challenges associated with researcher bias due to its exploratory and naturalistic nature. In this study, the researcher used open ended questions, probing a viewpoint that leaned towards own perspective, instead of precise closed ended response that does not identify any cues. Bias was minimised by conducting questions in a neutral setting, not seeking to fulfill contextual observations or beliefs of the researcher.

3.15 Conclusion

To provide a synopsis of this chapter, this chapter explained the methodology, research paradigm and the choice of selecting participants. Furthermore, the research design, strategy and data collection method were presented, accompanied by a rationale that influenced each choice. The following chapter will thus present the data collected from the interviews. Data will be examined and collated in themes called thematic analysis. Data is neither complex nor multifaceted and is presented in a fashion that allows for the researcher to be able to understand and interpret information.

CHAPTER FOUR

Presentation of Results

4.1 Introduction

The previous chapters outlined the holistic view of the aim of the study, providing relevant literature on the topic, accompanied by the methodology employed to access data for sourcing analytical findings. This chapter presents the feedback received from the interviews. Data from the interaction and dialogues with the respondents will be presented. The interviews were transcribed verbatim, thus thematic analysis will be used to examine, analyse and collate data into patterns which will be categorised in meaningful units and later into themes and sub-themes. The latent content will be the point of departure for the study and will be the basis of analysis of the results. The aim of this qualitative study was to assess ways to improve the quality of services using the Total Quality Management and process re-engineering techniques to fulfill user expectations at the UKZN libraries.

4.2 Detailed analysis

Semi-structured interviews were conducted on the ten UKZN staff at the library, ICS and finance divisions. Staff from each unit of operation were interviewed to get a sense of understanding in terms of whether all staff understood the role that TQM plays in organisations as well as to test their appetite for new developmental strategies sought to stay relevant and competitive as a Higher Education Institution (HEI). Interviews were conducted to get in-depth information on underlying issues relating to quality, technology and personnel, processes, as well attempts to promote high quality standards by the library were assessed.

That said, a survey (questionnaire) which form part of quantitative research was not used because of its nature where closed ended questions are asked prohibiting a researcher to probe further to gain more insight. The insight gained from qualitative data collection helps with the formulation of rich findings. Out of the fourteen questions asked during interviews, budget constraints, IT support, unrevised processes and resistance to change, appeared to be the highlights of hindrances of quality service at

the library. Table 4.1 is an example of meaning units, condensed meaning units, interpretation of underlying meaning, sub-themes and themes from data analysis of an interaction between the researcher and library decision makers.

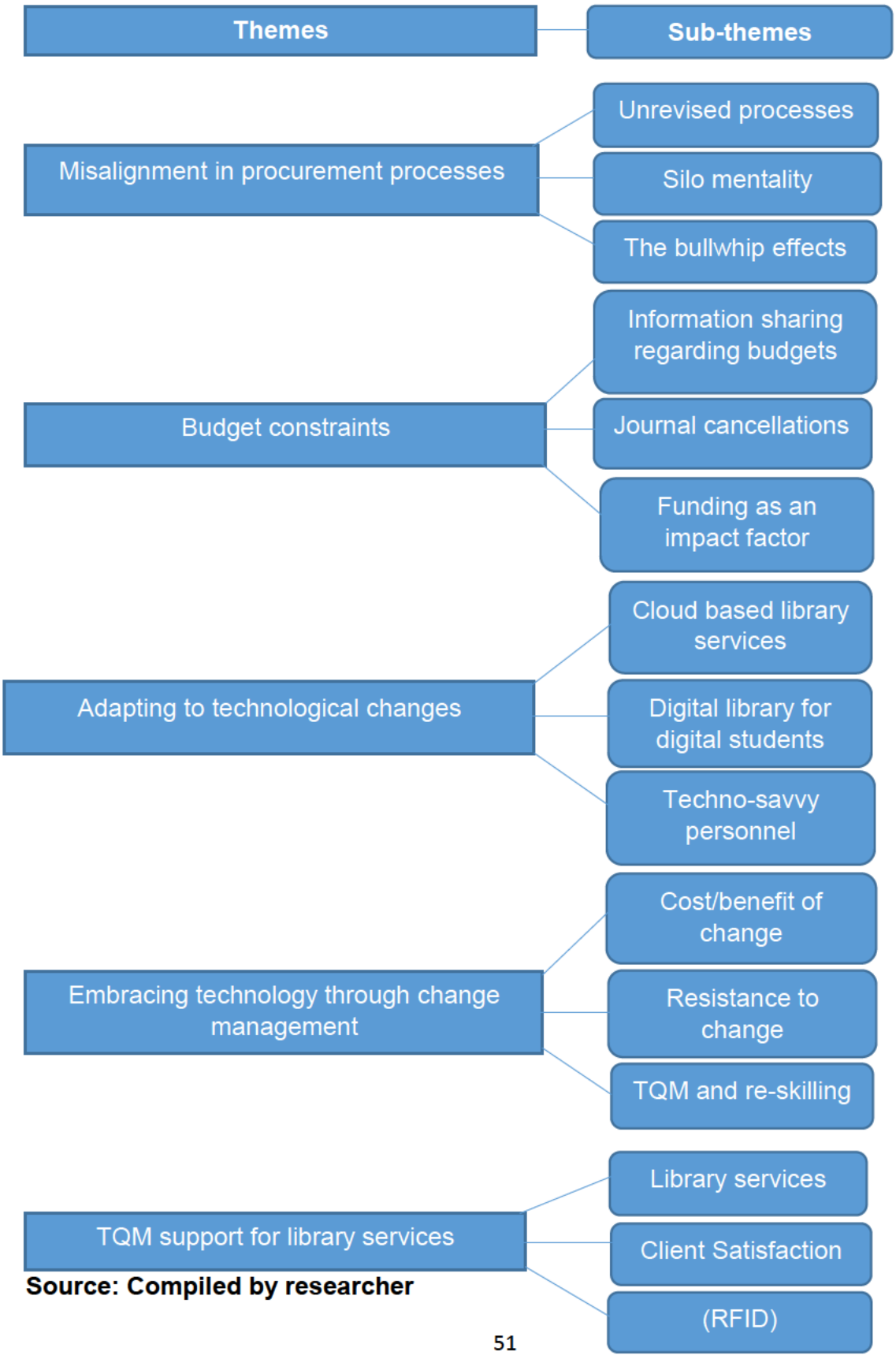
Table 4.1 Illustration of meaning units, condensed meaning units, interpretation of underlying meaning, sub-themes and themes.

Meaning Unit	Condensed meaning unit	Interpretation underlying meaning	Sub-theme	Theme
If I look at our procurement services for databases and books, we have been doing like our predecessor did, we haven't evaluated how functions can be enhanced	Misalignment in procurement processes due to lack of total quality management	Procurement process is not clearly defined or understood by staff	Current procurement process is not revised	Misalignment in procurement processes
We could say its misalignment, where people in the supply chain, those are the procurement and other guys, falling to the library processes, they do not understand how libraries operate	Inconsistency leading to misunderstanding between departments	Departments don't have synergic systems or processes / lack of uniformity	Silo mentality	

Source: Compiled by researcher

Table 4.1 outlines the formation of categories, sub-themes and themes using thematic analysis. The relationship from data to meaningful patterns is transferred into themes to make sense of the impact of the current situation, regarding the procurement of databases and books at libraries. Table 4.2 outlines the formation of themes, sub-themes and categories representing the data collected. The meaning units and condensed meaning are interpreted into themes and sub-themes representing in-depth views of the perceptions of the respondents.

Table 4.2: Synopsis of themes and sub-themes



Source: Compiled by researcher

4.2.1 Misaligned procurement processes

The participants acknowledged that there is a misalignment in library processes zooming into procurement process, as one of the areas requiring attention as the library is sitting with old unrevised processes which are not known or clear to the whole staff compliment, but a selected few individuals.

4.2.1.1 Unrevised processes

The concern among the staff is that processes, more essentially procurement processes, are not clearly understood by both support structures of the library, as well as among the library staff members. The library is still operating with processes which have not been revisited, evaluated and redesigned to suit the needs of the current students. One of the respondents had this to say:

"I mean, if I look at our procurement services, for like, databases and books, what comes to mind is we've been doing it like our predecessors did, we haven't gone to a stage of evaluating whatever we do, how can it be enhanced to function better than how it has been happening, so I would rather say yes, we are at that stage". (R1)

The respondents had a common voice, saying that the library is a specialised area of the university with unique type of products, as compared to other departments. They highlighted that electronic books and databases which are allocated a big chunk of the budget cannot be procured in the same manner that other supplies and services are bought and also, procuring processes must be adjusted to fit the nature of those products, which is a challenge for now. Another participant had this to say, in this regard:

"We are relying on them to process most of our acquisitions and we then have that kind of a situation because we are operating differently, compared to the guys who normally buy the normal stuff like sugar and milk and desks and tables". (R6)

4.2.1.2 The silo effect

Some respondents described the silo mentality among the staff members, or divisions which create a lack of consistency in processes and the workflow, since everyone is

only interested in what their departments can offer and not assisting or working as one unit with other departments. The respondents noted that:

"It's clearly understood by library staff, but it's not all of the staff, it's just acquisitions, but I think the other aspects like people who are administrators, they will know because they buy other staff as well". (R7)

"We are not working together as a unit, it's more like we are working as individuals". (R2)

"The other group would focus on their job and would not engage in other duties, yes, so it's more like individuals, but yes, we get together whenever there are meetings, but even though when we are together, it seems to be a division". (R2)

One respondent mentioned how difficult it was to answer some of the questions, since some processes do not apply directly to their department, stating that they only concentrate on their unit.

"Like I said, that it's little difficult for me to answer certain questions because these things don't apply to us directly, maybe indirectly as well, because we don't deal with suppliers, we don't deal with outside departments within the university community". (R4)

4.2.1.3 The bullwhip effect

One participant also reflected on the bullwhip effect caused by different times of operations between the library and its vendors, alluding to the communication barrier caused by the geographical location of vendors and a factor which also tampers with lead times of library orders.

"Like I said, the setback is the geographical location of the publishers as well, you see as much as we work with people that are within the South African area, but we also totally depend on overseas because most of the books are published overseas, so there are delays sometimes in delivering those books, sometimes the delay in contacting the publishers and that will have a setback on us in reaching the goals that we want to achieve". (R7)

Another respondent mentioned that cataloguing of each books has a turnaround time of 24hrs, though it is difficult to establish the turnaround time for thesis, it takes longer to catalogue due to its uniqueness and subject areas falling outside library staff disciplines or areas of expertise. The participant noted that:

"Our turnaround time for books is 24 hours, we give ourselves 24hrs but it's actually done in less than that, we give priority to new material. The only thing I can't give you a time frame on is our thesis because of the volumes that we receive". (R4)

4.2.2 Budget constraints

All respondents touched on budget constraints as a major setback causing the library not to perform at its best. They mentioned that the budget was not stable, the budget gets cut from year to year, and the library is having to settle with a little budget which forces them to settle for cheap service providers and cheap systems with no room of improving processes or implementing new techniques. This is what they had to say in this regard:

"Related to supply chain, yes, there may be setbacks that cause the library not to perform better, the one that comes to mind being the budget which keeps fluctuating". (R1)

"The budget is always cut every year as we go forward, and we are told that the budget has been cut, this is what you are going to be receiving for this year, then it's up to the library how they decide to use the budget, well library executive divide the budget". (R4)

"The library staff has no choice, they are stuck with the cheapest or the one that's free and if you want to improve the system of the library, the working, the running and the future of the library, I think funding is very important. So, to answer the question, funding covers most of, or the broader part in terms of holding the library, moving forward". (8)

4.2.2.1 Information sharing regarding budgets

With regards to this issue, the participants noted that:

"I will say we normally have structures and we communicate information through structures. We source information when we are going do a cancellation, because

cancellation needs to come from colleges, not from us, in terms of priorities and stuff like that, so yes, the information flow is always there". (R1)

"We are not told much about the budget, okay, yes besides the fact that there is no money available for certain things". (R2)

One respondent mentioned that the library journals normally receive the highest budget and that is communicated among the library staff through different forums including emails, meetings, etc.

"The library or the journals got the highest budget because we didn't want to compromise the service and we always communicate that, we are transparent in those processes, making sure we would rather save from trainings, we would rather save from personal costs, let us not fill up let us not fill vacancies, let us not advertise, let us decrease what we call travel allowances, but the main business of the library should not be compromised and its being communicated via emails, policies, budget forums and other meetings that are relevant to address these issues". (R3)

Other respondents differed and had a common understanding that they were not consulted regarding information on budget preparation for the forthcoming year, but they were rather informed of any financial changes and had to work with whatever was allocated.

"*We got no say in what is purchased, we got no say in terms of how the budget is used and whether you are doing something, whether you apply a certain technique to improve what is done that side". (R4)*

"We are informed not consulted". (R4)

"Top management, they will have all the details in terms of why the budget keeps shrinking, but we the staff are also informed of budget issues, whether is plus or minus, we do get informed, but we don't have much in terms of the decision-making, but we are informed of the changes of financial issues". (R5)

4.2.2.2 Impact of journal cancellations

Respondents felt that the cancellation of electronic journals and databases had a negative impact on research, teaching and learning, as they are supposed to be the supporters in the production of a rich research output.

"The impact would be the negative one, the impact would be that you are making the research output, the quality of the output to be compromised". (R6)

Another respondent cited financial distress as one of the reasons why journals get cancelled. Ultimately, these cancellations are not received well by the users, especially the academics, as they compromise their effectiveness and the quality of their work. Research quality goes a long way for any academic institution, as it also contributes to the credibility and rankings of the institution, among other HEI's.

"It has caused some complaints from the users, but the decisions to cancel some of these subscriptions were based on the financial crisis that the library department was facing". (R5)"

"A lot of these journals that have been cancelled are available online". (R4)

4.2.2.3 Funding as an impact factor

One respondent mentioned the importance of having enough funds, highlighting that the options of any unit are unlimited when there are enough funds. In contrast, the lack of funding has been regarded by respondents as a hindrance, as the library ends up with old processes, and no room for improvement, consequently halting the service offerings of the department and tarnishing the image of the institution with poor quality services they end up settling with. Some of the respondents put it this way:

"Once you have funds, your options are limitless, are endless". (R8)

"If you ask me personally, libraries, I think they seem to be neglected by the university and they seem to be having to find the way on their own, whereas other departments, if I had to use ICS as an example, seem to have more support you know because I get that they offer vital service and frontline service and they integrated every part of the university so they do need that support and it's the university image you know, but

library is an integral part of the university, and I would think they also need more support". (R8)

"In South Africa, especially at UKZN, we lack that type of corporation and budget itself plays a very negative role, the constant cutting of the budget plays a negative role because the library is placed in a situation where decisions have to be made and sometimes correct decisions might be missed because of budget constraints". (R9)

4.2.3 Technological changes

It was noted by the respondents that there must be urgency in dealing with technological changes, for the library to be on par with its users who are techno-savvy and require relevant assistance in addressing their needs. The world is evolving, technological changes are inevitable, competition is becoming strife and therefore, respondents felt that the library must embrace the changes brought by technology to be able to understand their needs, hence, crafting strategies that satisfy those needs.

"I don't think there are skills per se, that can be taken from achieving like a degree or a diploma. However, being technologically alert means you want to practice technology so as to be able to assist kids who are technologically savvy. So, in other words, you wouldn't find it easy to assist kids who are into Facebook if you going to say well I'm just shying away from social media as a librarian so you definitely have to be practicing what the new generation is practicing, so as to be able to help them in terms of technology and be able to adapt". (R1)

One respondent relayed that the initiatives to support technological changes by the library included the introduction of Converas and Research Interest Groups (RIG), referred to as a cluster of faculty researchers, as well as PhD students assigned to work on a shared research theme. These groups represent evolving areas of research strong points in a school. One participant noted that:

"Right now, we are rolling out Converas, which is a research initiative of the university. It is being rolled out not only by the library, but also the research office, but in partnership with the library because the people who will be responsible for training academics are all Converas or RIG researchers". (R10)

4.2.3.1 Cloud-based library services

All of the respondents highlighted a transition from SirsiDynix Symphony to an Online Computer Library Centre (OCLC's) World Share Management System (WMS) as a milestone for the library, as they regarded this integrated system as a stop shop search engine for all library services. The move was applauded by the library staff members, as it has improved their services significantly since it provides more than just issuing and returning of the books, but also allows forecasting for new purchases and weeding of the old collection to take place. The respondents regarded this development as a supply chain initiative to satisfy users, increase efficiency and reduce costs. This is what some of them said:

"We have just acquired this module in WMS, it's called collection analysis,, no its collection evaluation that's going to help us to analyse our collection so that we are able to compare our collection with the collections of other institutions which are on WMS, which also have this module that will help to inform our book buying as well, and it will also help to inform our weeding because that module enables you to identify even collections or parts of the collection that are unique to you as an institution". (R10)

"Okay, firstly, we rely quite heavily on our internal systems, for example, the proprietary system that we purchased from WMS supported by Sabinet, that especially looking at it, we will be able to use various components within it". (R9)

One respondent recognised the transition to WMS, but however unpacked that the system is a library internal system only and is not synchronised with other departments that are linked to the library processes. The respondents reckoned the capacity of the system is not robust enough, as compared to the systems adopted by other departments within the university.

"If you compare library with ICS, ICS has a whole team of people working on the system. Yes, the system does much more, but as long as your system has backup, many people have a team of people managing it, they are now able to run the system to develop the system to do more things like what we use in ICS talks to different

departments as well, HR, Finance, RMS, CMS. So, if someone enters one thing, its entered into the entire system and can be accessed in different places". (R8)

4.2.3.2 Digital library for digital students

Responding to whether the library is suitable for servicing 21st century students or not, the respondents mentioned that:

"Not yet, we striving to but not yet, there are quite things that are still not there". (R1)

"Not really, because some of the students are still not able to, cannot have access to e-books, they are not aware of the online services without having to come to the library for certain things and some of our staff as well are not that much well trained when it comes to using technological devises". (R2)

One respondent expressed that even the physical appearance of some of the libraries, singling out the Westville library, were not welcoming or conducive for learning. It was also noted that the library was not stimulating, as the people were not replaced by appealing signage or machinery that provided clear and proper navigation around the library, users had to struggle to find their own navigation around the library.

"There is nothing that the library offers. When you walk in to say that this place is 21st century, it looks like an old 1930 you know and I think it plays quite a big percentage in how people want to learn you know, what's conducive to learning environment you walk into the place that's a bit dodgy and somehow in your mind it puts you off". (R8)

One respondent was positive that the library is moving towards the right direction in achieving an e-library, though that have not been fully implemented.

"They are suitable, but obviously there are areas where we need to improve, for example, one of our goals or one of the visions of the library is to be an e-library of the 21st century. We've taken steps towards that, but we are not there yet". (R10)

4.2.3.3 Techno-savvy personnel

Respondents collectively agreed that the library was not suitable to service the 21st century students. They felt that the library was lagging in terms of staying abreast with

technological developments and its staff was not ready or fully equipped to operate in a digital age environment controlled by mobile technology, social media and the looming 4th industrial revolution. Most of the respondents attested to the fact that personnel should be aware of their surroundings, as the market they service is at the forefront of adopting any technological solutions.

"I would say we are not necessarily that suitable, we are still lagging because we are still battling with technologies and the concepts that we should have actually mastered maybe 5 years ago and we are still having those kinds of challenges, some kind of resistance on certain processes because the 21st century kind of students are born with smart phones, they are born with Facebook accounts. So now, when they are coming here, they are expecting us to be on par with them, but in most cases, you find in many levels we are not actually there, so we are only trailing behind them and that's the kind of reality that we are facing now". (R6)

4.2.4 Embracing technology through change management

It was established that technological changes and change management should be inseparable, when it comes to maintaining a quality service, as the staff tends to hold on to the old ways of operating and not being innovative to keep the institution competitive and relevant.

"We identified a need for a change management workshop when we were exiting the old library automated system, that was one of the pitfalls that was identified. It's something that we should have attended to, but we didn't". (R10)

4.2.4.1 Cost/benefit of change

It was established that the mindset of the respondents is leaning towards embracing technological changes. The respondents understood that technological changes, if well embraced, can be beneficial to the institutions, as well not investing in change management to support technological changes can be detrimental to the progress of the institution and continuous improvement will be stalled.

"Things are changing every day, technology is changing, libraries are now having to adapt to new technologies, so that's where change management can play a huge role because while things are changing, while our patrons are changing, you want staff to be where the users are, so the change management is also to ensure that our staff members also adapt to where our users are or what our users' needs are". (R1)

One respondent cited:

"The library unlike other fields, normally the people in it tend to stay longer than in other places, and if change management is not handled, sometimes what happens is the very same kind of a group of people that you've been having over time can become a liability to the system itself". (R6)

4.2.4.2 Resistance to change

Though the library is transitioning into having an e-library, some respondents still prefer the manual version of material. They are resisting to accept change, as it is revealed that change bring uncertainty to people and once the uncertainty emerge, productivity is negatively affected. This is what some of them said:

"People like I've spoken to, academics and myself included, we still prefer to use the paper version of something than to use an e-version, so it has impacted academics and people of the older generation who prefer the paper back instead of the "e". (R4)

"Remember one thing about change, people always resist change, why, because change always brings something called uncertainty". (R3)

4.2.4.3 Instilling TQM and re-skilling of personnel

The respondents were of the view that little is known about supply chain or TQM and the impact it can have on libraries. Again, it also emerged that the staff is comfortable with old processes, which are to an extent not compatible with the current users' lifestyles, preferences and expectations. Furthermore, the respondents did not even have an understanding that these two areas of specialty could support each other to achieve effectiveness. Below are some of the responses which emerged from the participants:

"To be honest, I've never really thought about it because in my mind, my understanding, I didn't see similarities where something that's in a supply chain world apply to an academic institution. So, I didn't really think about this and the whole thing, maybe if I was more knowledgeable, I would be able to say okay I've noticed some misalignment or something that would help, I at the moment, I can't really say". (R4)

"The people we work with are well informed about their duties, they know what they are supposed to do, it's just that they seem to be reluctant and are not that driven into doing their job as they were 20 years ago". (R2)

4.2.5 Library services

The respondents mentioned that the background of poor quality emanates from the lack of funds which has been highlighted by most of the respondents. One respondent was against compromising the quality of a service to save funds, as the library is one of the core services offered by the university:

"My philosophy would be to never compromise quality of your service based on finances, so there are core functions of the university and library is one of them. There is no way you can compromise the quality of library just because you want to save money". (R3)

"I think what we need to do, we have to redesign our services to ensure that the millennials and other students are given perfect services in line with the 21st century". (R9)

"If I were to rate it at out of 100%, I would say I'm 70% satisfied, because sometimes even though they don't get exactly what they are looking for, they walk out of the library with something". (R2)

"For me, the fact that we can open 24hrs I'm happy with that". (R3)

4.2.5.1 Client satisfaction

It was common understanding among the respondents that feedback received from library patrons plays an important role, as they have suggestions boxes stationed at every library's issue desk. The respondents concurred that correspondence with

students through suggestion boxes and the survey enables the library to be on par with the preferences of the users, as opposed to having a one-way approach in addressing gaps and issues:

"Client service and survey was done last year in 2017, but can't say may be linked to the lack of skills, but just to check how satisfied our users are and we also have the suggestion box at the entrances of all libraries, where people can put in comments, both staff and students". (R5)

"I would like to say we've improved, like on customer / clients' feedback, we have suggestion boxes which overflow with issues which are like daily issues". (R1)

"In those suggestion boxes, most of the suggestions that they put would be reports of things that are not going right, services that are not being delivered properly or even the behaviour of staff, what we do is on a monthly basis we collate those, we put all of them together and then we try and give feedback as the progress of trying to address those issues". (R10)

4.2.5.2 Radio Frequency Identification (RFID)

One respondent reckoned the library was adopting some supply chain techniques to continually improve its services, as it aims to roll out RFID self-checkout machines across all campuses to improve efficiency and to adopt technological enhancements in processes and services:

"Yes, the services are good, they do meet the user expectations, though there are things that are a bit behind, especially when it comes to space, it's not yet there, it's not 21st century space in all libraries. There are libraries which are already there, but some libraries are still lagging behind in terms of technology, there are issues of RFID which is still behind". (R1)

4.2.5.3 24hr services

Some respondents felt the library was already on the quest of adopting TQM since approximately two years ago, the information repository started operating 24hrs and

embarked on a project of digitising some of their collections so that it is also available 24hrs anywhere anytime for their postgraduate students.

"In terms of overall service, we have improved because now you have users accessing libraries any time anywhere and in terms of 24hr services they can even access physical space if they want to". (R1)

"The fact that we can open 24hrs, I'm happy with that, I'm not happy yet about the way we deal with the manual /hard copies when someone is coming to borrow the book". (R3)

One respondent explained that not all databases are subscribed to. However, for the cancelled subscription, the library offers a Pay per View (PPV), where only articles required are ordered instead of buying a whole journal or database.

"We have a feed of collection which is insufficient, however, to mitigate that, we have a Pay per View, it is a 24hr service and within 24hr you can get a service". (R9)

4.10 Conclusion

Chapter Four presented the data gathered from the respondents who expressed their perceptions and shared their views on the existence of TQM techniques and the processes re-engineering initiatives in the institution's libraries. Some respondents indicated that they noticed tide in libraries to a direction of employing some of the TQM strategies, while on the other hand, others did not even understand the significance of a relationship between libraries and supply chain concepts. Among the areas of concern was that of budget constraints and silo mentality that existed among the library staff and between the library and other university departments.

Budget constraints were cited as the root causes for not implementing any new TQM activities and working in isolation was causing departments to have a different understanding about the importance of having a common goal to continually improve services of the division. The next chapter discusses the findings presented in Chapter Four, linking them with the literature underpinning the study, as described in Chapter Two.

CHAPTER FIVE

Discussion of results

5.1 Introduction

The study has undertaken to establish the level of investment in supply chain techniques, including TQM and processes re-engineering at the UKZN libraries. Adopting supply chain concepts to stimulate the success of service organisations has overwhelmingly given them a competitive edge over their rivalries. This chapter discusses findings derived from analysis of data collected through semi-structured interviews, as describe in Chapter Three. The discussion of the results presents the interpretation drawn from the findings of the research and propositions stemming from understanding literature.

The objectives of the research were:

- To assess the importance of understanding the procurement process of library electronic resources.
- To explore the ways in which change management can support supply chain techniques.
- To identify and describe the challenges associated with shrinking budgets of library essential materials.
- To identify and assess the best strategy to integrate supply chain processes to build a digital library.
- To establish and evaluate the skills understand skills required to improve library services through supply chain.

Themes and sub-themes stemming from the study as presented in Chapter Four are discussed in detail hereunder:

5.2. Process redesign for continuous improvement

The preparedness to embrace changes that improve quality had been pending over a significant period. This is confirmed by Shillinglaw (2003) 146, who argued that

"*The future of information provision is electronic (but access to electronic services is currently restricted in South Africa by poverty). The speed at which poor students will gain access to the Internet or what unknown technologies will speed up this access is unknown at this stage".*

Poverty has always been at the center of stagnancy in most organisations. Moreover, the lack of knowledge to survive in a penury driven environment can be costly, hence, the introduction of supply chain concepts including TQM, continuous improvement, etc. What was gathered from the respondents was the lack of knowledge on how TQM could provide for simulation strategies to maintain high quality standards using low budgets. Noting the level of awareness that existed amongst the respondents, none of them associated libraries with continuous improvement models.

Some respondents did not understand that there is a link between process redesign and continuous improvement because they are too focused on the old processes which they were introduced to when they commenced work. The respondents could not understand that supply chain has provided organisations with what to deliver by delivering it differently. On the other hand, other respondents demonstrated a deep understanding of the relationship between efficient process redesign and continuous improvement. This was displayed through a newly adopted OCLC's integrated system called WMS, which library staff endorsed as a good tool that links all the library departments. WMS performs functions not limited to acquisitions, circulation of library materials, metadata, resource sharing in form of Inter Library Loan (ILL), as well as license management. This system was regarded by the respondents as a single-search discovery interface which provides access to resources namely e-books, journal articles, theses, print books and DVDs. The understanding among the respondents was that though the library has not completely transformed, some of the processes are latest and support TQM techniques whereas some processes are redundant and require re-engineering and a renewed model and workflow. Be that as it may, the library has not tapped into block chain supply chain, lean thinking, e-learning or adopted any strategies that support the 4th industrial revolution. It can thus be confirmed from the findings of this study that there is a misalignment in the procurement of the UKZN libraries'

electronic resources caused by the lack of integration of systems that support revising and streamlining of processes to improve the resources and service offerings.

5.2.1 Managing queues

As a means to address the bottleneck in the provision of services, the respondents applauded the plan of the library as embedded in the university strategic plan to have RFID installed in every library to fast track the circulation of library material without having to rely on warm bodies for services to be performed. According to Butters (2008), RFID offers identification of technologies that can improve productivity of a business or organisation. Technology keep evolving and RFID allows for tracking of stock in huge quantities beyond line of sight and at a high speed. The respondents were aware that the employment of RFID could result in downsising, as the findings revealed that change comes with uncertainty for staff in any organisation. The Medical library is by far the only library with RFID technology and it has resonated to staff that the rationale behind adopting this invention was mainly to support the productivity of staff, in long term as uncertainty in funding, technologies and security of jobs also exists.

5.2.2 Backward vertical integration

The issue of unrevised processes as pointed out by the findings could be addressed using DAMAIC, a six sigma projects administration tool. The DAMAIC methodology allows for the revision of the current process which the respondents for this study pointed out does not normally occur. In a fast-paced environment where life suddenly revolves around technology, processes cannot stay the same over time. Other academic libraries employed processes like the CAPM, a project featured developmental tool that evaluates and automates the robotic on-demand scanning system for materials in remote sites. Indeed, the theory of quality management has been well accepted by organisations, both in the manufacturing and service sectors.

Service sectors have also embedded quality management philosophies on management staff, with the adoption of ISO 9000 Series to oversee quality unfolding as performed in the analogical industries. The initiative by the South African Medical

libraries, including the UKZN's Medical library, to implement Problem-Based-Learning, is applaudable. PBL allows for the available facilities to be conducive for improved learning processes and enhancement in interaction skills with the patients (Hines and Hines, 2012). While the UKZN has also adopted WMS as means to enhance the quality of its services, some institutions have adopted Quality Function Deployment (QFD) as a methodology for improving and maintaining the quality of products and services.

5.2 Information Technology (IT)

Noting the rapid changes in technology, the findings pointed out that the UKZN libraries are lagging in terms of technology, such that technological mechanisms are not used to their fullest potential to mould the facility into a state-of-the-art information hub. Therefore, the respondents noted the need for qualified IT personnel who would support the systems put in place by the library to ensure that they are effective and continually improved. It is thus important to note that IT is an enabler in the strategy to make processes more efficient. That said, IT is in place to support people, culture and technology, the pillars guiding the vision of the institution, hence, libraries cannot solely depend on IT for a turn-around strategy, all the structures that are mandated to drive the library and the university's strategic plan should be fully involved. The expectation to receive digital services by library users has escalated, hence the UKZN libraries are also expected to deliver those services to meet their customer's needs. That said, libraries have not yet transitioned into a 21st century digital library. None of the TQM techniques together with IT has been explored to integrate systems and processes suitable for techno-savvy users.

5.3.1 Social media

The findings of the study revealed that the respondents were of a view that the library should be equipped with personnel who are clued about social networks. This is in tangent with De Boer et al. (2012a) who mentioned that social media platforms can provide coverage to a large audience, as opposed to the library website and emails, since it has a social impact. Bundling users in group chats, Facebook page, Instagram post, blogs and Twitter permits for information to spread swiftly as some of the services

of the library are carried out and yet are not known to the rightful, intended recipients of those services. Social media has drastically transformed the way people search, retrieve and interact using these much convenient platforms. Since the university is equipped with Wi-Fi connectivity, it is thus essential that it is utilised to its full capacity and for the right reasons, as provided by the institution and stated in the code of conduct.

5.3.1.1 Mobile Instant Messaging (MIM)

Instant messaging has been a trend, as smart phones have brought about ease in information gathering and dissemination. One of the respondents proposed that the users must contact their subject librarians using WhatsApp application, which forms part of instant messaging. Applications like WhatsApp allow for users to connect in real time, as opposed to other platforms with longer turn-around times. Universities hold masses of population, thus, the feasibility of using the app can be somewhat undefined. However, this channel of communication can solve problems related to high costs, as the library struggles with funding.

5.3.3 4th Industrial revolution

As confirmed by Fischer and Easterly (1990), CAPM is able to capacitate moving the library collections to off-site remote locations to alleviate space pressures, though as the findings presented showed, some patrons still want an opportunity to browse through remotely stored materials instantly. That could call for the introduction and preparedness in artificial intelligence, robotics and mechatronics. It is evident that e-content has outdated printed content as the use of e-books, electronic journals and aggregated databases are increasingly used and commended for convenience, easy access and storage, by some users.

A university is a custodian of knowledge in a midst of critical social change, thus, it should be well prepared for changes that are likely to affect the execution of teaching, learning, research and community work, as embedded in its strategic plan. This is essential because the core business of a university is to grow the economy by training a capable, competent and resourceful personnel. That said, it is in the best interest of

the library to drive initiatives that raise awareness regarding the forthcoming changes that impact on political and economic landscape, as they later affect the operations of the division. Moreover, libraries should understand that creating awareness costs a lot of time. However, in contrary, the lack of awareness costs a lot of money, hence, it is always beneficial to lead transformation. The respondents seemed not to understand the importance of continuous monitoring and its impact on the future of the library, let alone that of the fourth industrial revolution, *vis-a-vis* procurement.

5.4 Client services

Client services refer to an act of taking care of users' needs before, during and after receipt of services. The respondents noted many initiatives taken by the library to meet the needs of their users to maintain good services. Among those mentioned included the integrated library system WMS, the closed access system at the entrances of all the UKZN libraries, the library mobile app, transitions to the e-collection, blogs, library surveys, pay per view and bundled journal articles. Surveys conducted yearly at the library served as an indicator of areas that required improvements as pointed out by the users. However, the management revealed that due to financial constraints and other helpers in driving a strategy that talks to the vision and mission of the institution, not all the new developments could be implemented simultaneously. It is evident that the library staff have users at the back of their minds, whenever services are crafted or improved. However, in a rapidly changing environment, the library seems to have a lot of improvements to implement to fulfill users' needs and their expectations for high quality services with limited resources.

5.4.1 24/h services

The respondents stated that the library had made improvements in line with improving services by opening the libraries for 24hrs. It is thus essential to revisit whether the services offered at night are as efficient as the day services, and whether this move addresses the needs of the users. Information retrieval at the library has been a daunting task, as the four-wall building is accessible to the university community, but with little help available to navigate the collection and not enough access to online resources assistance as the building is not manned by professionals 24hrs. The 24hr

services should also be extended to users off-campus, regionally, provincially and internationally, for the library to be declared a fully virtual site. The respondents noted the issue of broken links while accessing online databases. On campus, students seem to be getting preference over students who stay off campuses, as navigation to subscribed material can only be accessed from on-campus. It is undisputed that the university thrives to make e-learning accessible from wherever a student may be, for research purposes, with the use of the Moodle platforms, however, more can still be done.

5.4.2 Pre-request service

It was found from the study that the newly adopted WMS offers interlibrary loans pre-requesting services. The library could perhaps look at allowing for the same service to be piloted with library books, journals and theses. The issuing of books could be ordered electronically without physically visiting the library and prepacked for users to collect to reduce waiting times. One respondent mentioned the introduction of the library application, as students own electronic gadgets that connect using Wi-Fi and data enabling access to services at any place, anytime and anywhere, using devices. The user-friendly app can be downloaded by students for a smart workflow of attaining library services and materials. This development is tailored around user experience, all in one place and in support of quality service and user satisfaction.

5.4.3 Expectation vs perceptions

There was consensus amongst the respondents regarding the means to measure the quality of service through the most popular way of measuring quality at academic libraries, called LibQUAL or SERVQUAL. The UKZN library has so far used client satisfaction feedback surveys and suggestion boxes at every library, as tools to measure quality. Surveys and suggestion boxes are perceived by respondents as an effective and efficient manner to communicate with users, measuring their perceptions against expectations. However, according to Lorie et al. (2003), the LibQUAL+ methodology is the best form of attaining feedback in terms of perceptions as measured against user expectations. It is regarded as the tool grounded in the library

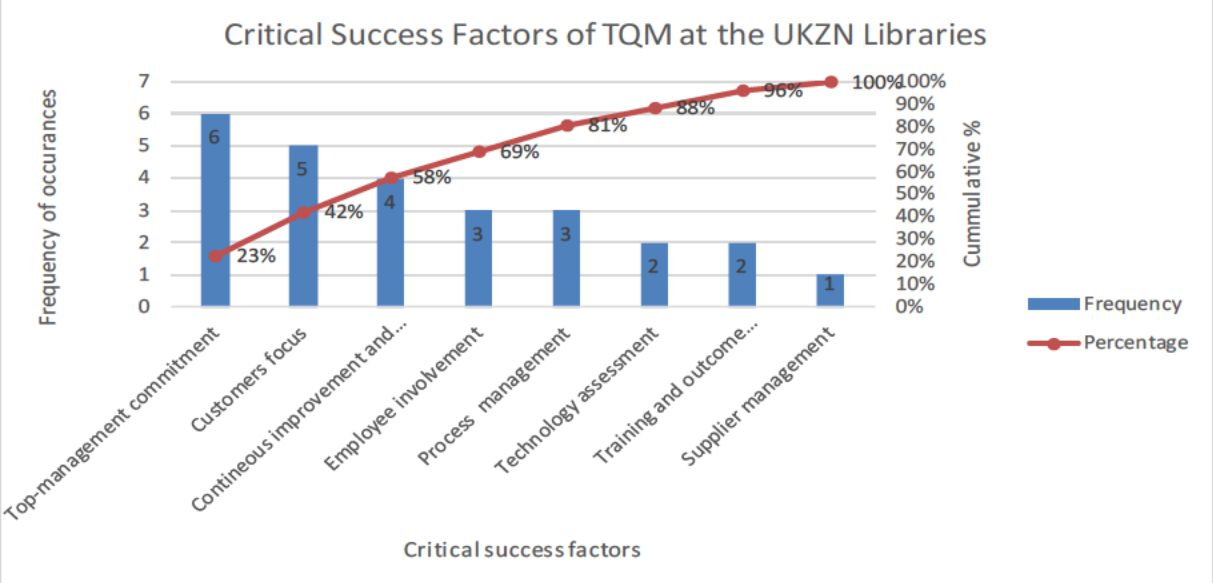
environment for research. Furthermore, it provides a framework for detecting gaps in the quality of service delivery.

5.5 Measuring service quality

The separation of the vital few against the trivial many is depicted in Table 5.1 and Table 5.2. The findings are therefore presented illustrating the levels of occurrences of success factors and errors thus, demonstrating the quality measure of the service at the UKZN libraries. These results emanate from interviews conducted to underpin the research problem and research objectives of the study.

Table 5.1 Pareto analysis of TQM Critical Success Factors (CSF) at the UKZN Libraries

Serial No.	CSF of TQM	Frequency	Accumulative frequency	Accumulative percentage
1	Top-management commitment	6	6	23%
2	Customers focus	5	11	42%
3	Contineous improvement and innovation	4	15	58%
4	Employee involvement	3	18	69%
5	Process management	3	21	81%
6	Technology assessment	2	23	88%
7	Training and outcome measurement	2	25	96%
8	Supplier management	1	26	100%
		26		

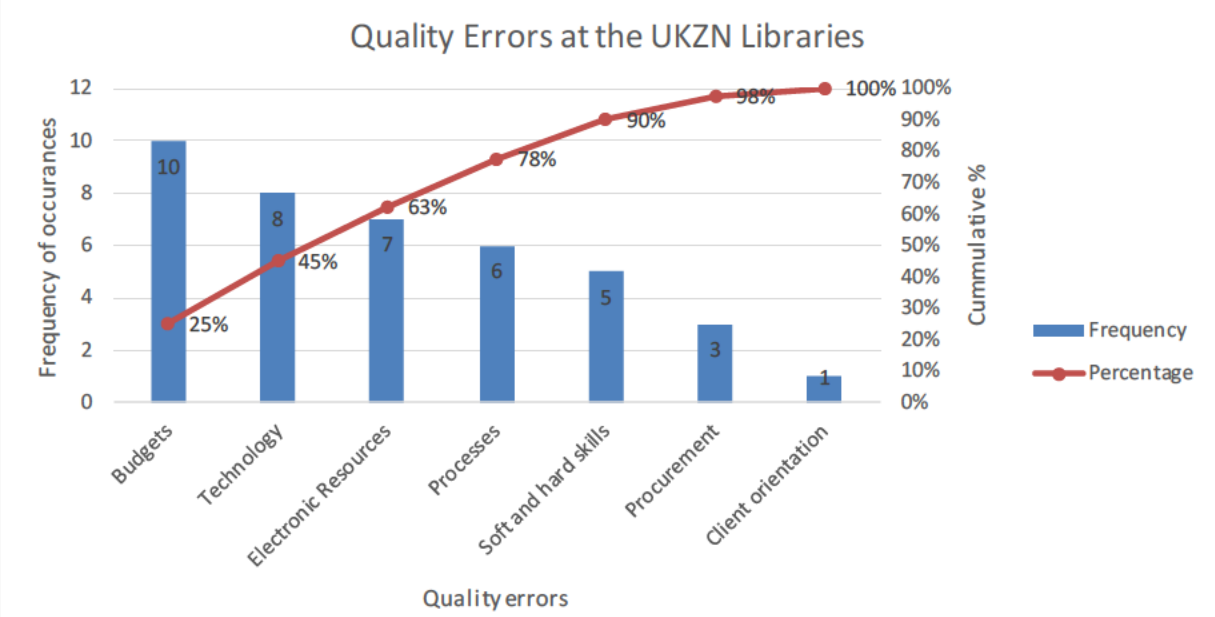


Source: Compiled by researcher

Table 5.1 demonstrates the critical success factors of TQM in the library setting, resulting from the findings. Vital few is in this instance, represented by the top management, customer focus, continuous improvement, employee involvement, as well as process management. Therefore, 81% of the success of the library is caused by these five factors, which are also known as a sparsity of effects principle.

Table 5.2 Pareto analysis of service errors at the UKZN Libraries

Serial No.	Service Error	Frequency	Accumulative frequency	Accumulative percentage
1	Budgets	10	10	25%
2	Technology	8	18	45%
3	Electronic Resources	7	25	63%
4	Processes	6	31	78%
5	Soft and hard skills	5	36	90%
6	Procurement	3	39	98%
7	Client orientation	1	40	100%
		40		



Source: Compiled by researcher

Further drawing from the findings, Table 5.2 represents the elements of errors that tamper with quality delivered to library users. As alluded to, the quality of the services of the library could be more enhanced if more attention is directed to vital few elements

among which are technology, procurement, processes and budgets. These elements are at the center of quality errors that cause the library not to achieve Total Quality Management. It can thus be concluded that 80% of errors is caused by 20% of the issues not yet addressed by the library. The library, in order to succeed in correcting quality errors, must always consider end-to-end supply chain solutions as depicted in Figure 5.1.

5.6 TQM & strategy

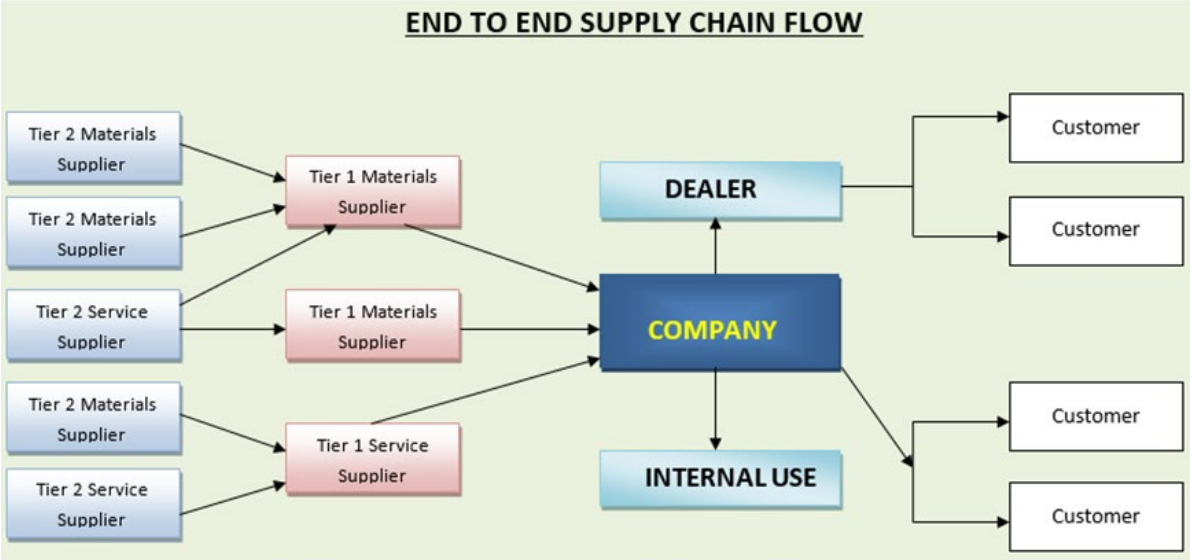


Figure 5.1 End-to-end supply chain flow

Source: Adopted from Pinterest

Figure 5.1 represents the flow of supply of goods and services from upstream (tier 2 suppliers) to downstream (tier 1 customers). The table elaborated that for services to be successfully carried out, there must be a flow from upstream which support the focal point of the operations before the service can be transferred down to the end users. End users are thus regarded as the most important elements in the end-to-end supply chain, as they determine the need for having a certain product manufactured or service offered. The findings reveal that UKZN libraries for have adopted TQM from supplier to customer by maintaining supplier relationship management with publishers who are sitting at tier 2 in the supply of electronic databases. Tier 1 suppliers are the intermediaries who handle peer reviewed articles on behalf of the publishers and UKZN

is a focal company which provides search engines where these electronic resources must be accessible timely in research, teaching, learning and community work is efficiently carried out by users who are represented by customers on the supply chain flow.

5.6.1 Enterprise Resource Planning (ERP)

ERP system is the integrated management of fundamental business processes which provide access to information in real-time and accurately. It is facilitated by a software and technology (Abugabah and Sanzogni, 2010). ERP can be used as a strategy to solicit continuous improvement at academic libraries to ensure quality services are offered. For end-to-end flow in services, higher education institutions could benefit from investing in ERP. However, the UKZN libraries are using Integrated Tertiary System (ITS), which is an integrated system commonly used by most South African universities. The respondents for this study indicated a sense of client orientation in terms of services, though the extent and efforts of revolving library services around satisfying quality expectations of users are not as effective as that of the private sector or corporate world which adopted the ERP to increase revenue, since profits are at the forefront of their existence.

5.6.2 Robust and accurate forecast

The respondents stated that the library is not suitable for servicing the 21st century students and acknowledged the efforts by the library management to have integrated systems to improve services. Though WMS, pay per view and other models were noted as models to support the productivity of the personnel, a remote library has not yet been established or implemented by management. Unrevised processes tended to cost the division as the projections suitable to the changes that affect the library were rather superficial. The library only focused on models that were relating to librarianship, more as an effort to improve quality and re-engineer processes. This was done without taking into cognisance that more re-engineering processes could be shopped from other disciplines, supply chain in the main using Six-sigma's PDCA, DMAIC, (RADAR) and (DFFS) far less costly techniques to facilitate continuous improvement.

Out of all the four continuous methodologies, the respondents were more enlightened about PDCA and DMAIC by the researcher, to clarify a co-existing relationship between supply chain and a unit like an academic library. These strategies were classified as cost effective by the researcher in that they allow for a defining that provides for a platform to identify the problem, outline possible areas of improvement, identification of activities and improvement opportunities. The respondents affirmed that the library was sitting with outdated processes which somewhat did not tally with the requirements of a robust maneuver-based environment, thus hindering process performance set objectives that support the success of enhancement projects which could allow for quality assurance. Furthermore, defining and measuring of KPI's stages support each other, as the implementers can be able to assess if the project is on track or not. DMAIC also allows for analysing processes to determine the root cause of poor performance and poor service delivery, in the case of an academic library.

5.6.3 Timing

End-to-end supply chain flow allows for reasonable lead times, thus, the library, in the quest for providing reasonable responses to service requests, employed strategies to timeously address the pressing needs of the users. E-books, electronic databases, pay per view, 24hr access to the facility, have all proven to be the means to secure the high-quality standards and reputation, with a ripple effect expanding to the university competence. This provides for TQM strategy, continuous improvement and adoption of lean principles where non-value adding activities are eliminated to ensure simultaneous quality services.

5.6.4 Costs to meet demand

Though end-to-end supply chain requires for costs to meet the demand of users, libraries worldwide have not yet grasped the essence of autonomy when it comes to budgets, as they still heavily rely on government funding to survive. If properly managed and supported by TQM techniques, funding allocated to academic libraries could be spent sparingly, consequently achieving a competitive edge tailored to user satisfaction. Findings revealed that funding is a challenge that cause a resounding

effect to the library quality as excellent services require adequate funding to be injected in order to afford essential services that meet preferences of users.

5.7 Change management

There was a collective detection of silo mentality at the library, in that units within the library divisions have policies within policies and these are not synchronised for the execution of uniform services, as expected by library users. Change management was endorsed by the respondents as a necessity for the library. It is a crucial exercise for any division with decentralised operations and teams. Though some of the activities, including photocopying facilities which are managed by an outsourced supplier, are centralised university wide, most of the library services are much decentralised and synergy is not achieved.

Trainings and workshops held by the library staff, as the respondents alluded to, are not beneficial in most cases, as Proof of Concept (POC) to be practiced as evidence deriving from experiment from testing grounds or pilot project is usually not carried out. POC should prove that a design concept, new model or notion, is feasible or not. The lack of knowledge of how supply chain could benefit the library in offering total quality services is a result of its organisational structure which is not a multi-discipline one. Team centralisation allows for a synergic effect to be achieved in the manner that a group of specialists contributes to the unit, rather than the librarians having to specialise in all disciplines. The effort to leverage augmented workforce can thus be instilled through change management from top management down to the ground level employees. The widespread changes in the economy and technological advancements calls for a strategy that facilitates change management in that continuous improvement is understood and practiced by all staff. The findings reveal that not adequate change management has been undertaken at the UKZN libraries as staff still resist change and maintain a silo mentality when it comes to performing functions.

5.7.1 Re-skilling of personnel

Soft skills have been highlighted as a huge challenge for libraries, most importantly academic libraries. In relation to van Kemenade (2012), the findings of this study showed that there is proper execution in skills. However, soft skills in a form of communication skills, as well as team-based quality management, are lacking at the library, which has resulted in a silo mentality that halts the functioning and delivering of services to library clients. To be able to deliver quality services, organisations must adopt initiatives that adapt to users' needs in terms of soft and hard skills, especially as libraries fall under an umbrella of a service sector. This is confirmed by Hackman and Wageman (1995), who stated that TQM practices achieve core philosophies of an integrated system that involve creation of supplier corporation, employment of cross-functional teams, rather than silos and in-depth identification of user requirements and satisfaction. The one way an academic library can achieve this is through re-skilling of staff, integrating supply chain into the culture and system for the betterment of the processes. TQM could be to some extent incorporated as a skill in the workplace, however the findings of the study reveal that library personnel have no knowledge that TQM is one strategy which libraries can use by adding it as a skill to improve services.

5.7.2 Kurt Lewin's model of change

The library environment is associated with a lot of reluctance or resistance. The respondents pointed out that library staff tends to stay longer in employment, which results in declining levels of enthusiasm toward their work. Though other scholars regard Kurt Lewin's change management as an episodic change, while organisations require continuous change to be able to have inspired personnel. While the library supports staff retentions, change management should also be the face of modeling processes of the library, to avoid redundancy in staff and having staff members who are a liability to the institution, as pointed out by the respondents. Models like freeze-unfreeze-refreeze are essential in changing the way the facilities and departments in both public and private sectors operate. Thus, introducing supply chain techniques can be done using these kinds of models, since the library is a specialised area of practice which however requires strategies to assist in its long-term sustainability. Continuous

improvement may be far-fetched, but it involves a system, procedure, structural, and cultural change. This is essential because the core business of a university is to grow the economy by training a capable, competent and resourceful personnel.

5.7.3 Innovative leadership

Library executive management should adopt leadership that drives innovation. This can accordingly accelerate innovative leadership, which in turn allows for shared services and economies of scale as a strategy to save costs while enhancing services offered by the institution. The attempts to employ shared services was found to be on the decks as the library is amalgamating its client services by having a one stop shop for all library materials and services, including, issuing, returning, renewals, placing holds, inter-library loans, short loans, etc.

This development has been implemented in some libraries. However, it has not been thoroughly analysed for some libraries, in terms of its functionality and maintenance, as respondents explained that some of the UKZN libraries are not stimulating or conducive enough for a learning mindset. It is therefore the task of the library leadership to come up with thought-provoking inventions of how to enhance the physical appearance of the facilities, yet heavily investing in cloud services.

5.8 Budget constraints

It was established that progress which could assist the library to revise processes that drive automation, allows for preparedness for the 4th industrial revolution and the ability to service the 21st century library students was hindered by financial constraints, or the lack of funding. The findings of the study showed that most challenges faced by the library were due to budget constraints, among other factors. The effect of constraints was detrimental to a point where library units struggle to make new developments, forecasts for the forthcoming year, or even redesign processes. With reference to the merger, some of the divisions within the institution gained more attention over others, thus the library has since been burdened with having to survive in isolation, as some of the respondents unpacked. Helfer (1998) 27 emphasised the importance of enough

funding for libraries saying, “No library, no matter how exceptional, will thrive when the organisation they serve hits dire financial straits”.

Research on quality is mainly conducted on students, yet little is done to provide for the infrastructure that supports quality service offering. Furthermore, the findings showed that budget constraints had led to cancellations of electronic resources, which are a core tool for producing quality research. There have been countless occasions of journal cancellations at the institution which respondents perceived as having a negative impact on the users. The cancellation of electronic journals is parallel to an act of not filling of vacant posts when staff retires or resigns due to the financial squeeze. The respondents raised the fact that this act is detrimental to the service or image of the library and institution, as no machines or automated tools replaces services of these unfilled vacancies or functions, instead, users must find their way around getting library resources and assistance.

The University of KwaZulu-Natal could not make it to the list of the world’s best 200 universities. Saisana et al. (2011) 165 confirmed the role played by adequate provision for research material that motivates production of new prestigious research saying:

“*The Shanghai Ranking Consultancy annually reveals the rankings of the world’s top 500 universities. The selection is based on indicators such as the number of alumni and staff winning Nobel Prizes and Fields Medals, the number of highly cited researchers, and the number of articles published in select journals”.*

It can thus be argued that cancellation of library databases and journal has an evident negative impact on the research output of an institution, which results in its credibility being compromised.

Though the respondents collectively endorsed investing in IT as a solution to assist the library in sourcing integrated systems that would pool services together, the library must organise for optimal use of staff using the available funds. This could be achieved by allocating more funds for trainings and workshops, as well as allowing for testing grounds to implement innovation and enforce knowledge transfer from those workshops until continuous improvement and monitoring of library services is in the

DNA of every staff member. It can therefore be safe to conclude that libraries should receive a top-sliced budget among other university projects, as their services are the core function that supports academic progress.

5.9 Conclusion

Chapter Five discussed the findings presented in Chapter Four, with the aim of answering the research questions outlined in Chapter One. The relationship between the findings and literature was established, thus, the extent in which the library incorporates TQM and process re-engineering in its operations was discussed. Among a few challenges noted was that of unrevised procurement processes, a requirement for change management among stuff, and technological readiness to embrace a digital library for 21st century students. The following chapter presents the conclusion and recommendations of the study. Unagha (2009) emphasized the importance of addressing shrinking budgets by being strategic in investing in library materials. The findings to some extent reveal that the library has sourced strategies to deal with shrinking budgets which are e-collection, pay per view, interlibrary loans pre-requesting services and bundled journal articles.

CHAPTER SIX

Conclusion and Recommendations

6.1 Introduction

The main objective of the research project was to unpack ways and the level of execution of continuous improvement initiatives outside the scope of library, including the understanding and implementation of TQM techniques at the UKZN library. The aim of the study was to assess the extent of understanding and source information as means of investing in techniques that would improve the services offered by the institution's libraries. This chapter aims to summarise the findings of the study, linking them to the literature, thus drawing a conclusion and making recommendations.

Conclusions and recommendation are covered in this chapter, based on the study's research questions as follow:

- What is the importance of understanding the procurement process of electronic resources?
- How can change management support supply chain techniques?
- What are the challenges associated with shrinking budgets of library essential materials?
- Which strategy is suitable to integrate supply chain processes to achieve a digital library?
- What skills are required in the library to embrace technological changes and improve services?

The conclusions and recommendations presented in this chapter emanate from the findings, as outlined in Chapter Four and discussed in Chapter Five.

6.2 Summary of the study

Chapter one provided the background, aim and the problem under study. It presented the rationale for undertaking the study. It outlined the research questions which address the research problem, with the aim of fulfilling the set research objectives. The research

methodology used was presented in this chapter, it also acknowledged the limitations of the study.

Chapter two provided the literature review of the study. The purpose of reviewing the literature was to gather knowledge by means of the views of other scholars, on the same phenomenon. The aim was to examine how the study contributes to the larger body of knowledge.

Chapter three provided the methodology used to execute the study. The choice of methodology was determined by the problem statement. The chapter presents the sampling techniques and the research instrument utilised to collect the data from participants, as well as the selection criteria of the participants.

Chapter four delivered the findings of the study. It was noted that the respondents collectively indicated the lack of understanding or implementation of TQM techniques that could improve the library's operations in terms of quality and efficiency.

Chapter five provided a discussion of the findings presented in Chapter Four. The outcomes of the study were also compared with results from previous related studies. Discussions and views of the researcher were captured in this chapter, in line with the research questions as outlined in the first chapter.

6.3 Key findings

The key findings of the study are built from each research question. The aim of the study was to determine the level at which the UKZN libraries incorporate TQM and process re-engineering techniques as means to maintain quality and continuous improvement. The study revealed that the library is on a quest to continually improve its services. However, the extent and the questions of effectivity is the focal point of the findings. Some of the respondents did not have a clue of any initiatives of TQM, process re-engineering and continuous improvement, while others were aware of the changes, but did not entirely associate them with supply chain. There is a sense of great lack of knowledge about other fields that can deliver high standards of quality, efficiency of staff and reduction in costs.

6.3.1 What is the importance of understanding the procurement process of electronic resources?

The study intended to establish the seamlessness of procurement processes and the misalignment that existed between the library processes and TQM techniques. The findings revealed that some respondents were aware of the misalignment in procurement processes, while others did not understand how TQM processes could support library processes to enhance the services offered by the division. Among the challenges established under the same research question was the fact that a silo mentality that existed among the staff caused these misalignments in processes and departments worked in isolation, which led to the library's inability to adopt mechanisms from disciplines like supply chain to elevate continuous improvement. That mentioned, the division among teams causes bottlenecks in the acquisition of library materials, which consequently results in delays in the arrival of relevant teaching materials that inconvenience library patrons.

6.3.2 How can change management support supply chain techniques?

The findings showed that the respondents all welcomed change management activities, as these are in line with staff embracing technology which is rapidly evolving, as well as to curb resistance to adaptation of new processes that currently exist. Failure to apply change management in an environment saturated by fast paced technological advancements may lead the library into obsolescence. The library has a reputation of having a workforce which is loyal to the organisation, in terms of retaining their jobs till retirement. It is essential that trainings are thus offered from time to time, as a means to stimulate the staff's mindset to that of the 21st century and that which supports innovation and the 4th industrial revolution.

6.3.3 What are the challenges associated with shrinking budgets of library essential materials?

The study found that consensus was reached by the respondents, regarding insufficient funding to employ techniques and re-engineer processes to proliferate productivity in the personnel, accompanied with providing tools that would better the service quality of

the libraries. Academic libraries face a challenge of swift changes, which is informed by the age gaps of their clientele, thus, services offered must be crafted in ways that address the times and preferences of these technologically oriented patrons. The setback is that not enough funding is injected into libraries to administer these changes. To be able to migrate the library from manual printed collection, a significant amount of funding is required. Electronic databases are highly priced and the library resorts to cancelling some of the databases due to the lack of funds, which is detrimental to the service offering.

6.3.4 What strategy is suitable to integrate supply chain processes to achieve a digital library?

The respondents for this study revealed that the library is on the quest to transition into a 21st century digital library, though a lot still needs to be done. Citing the factors already mentioned, including unrevised processes, silo mentality and budget constraints, the respondents felt it is highly unlikely to employ any concepts that could turn the whole division around. A 21st century library requires more than just a collection that is geared up for servicing digital students. However, even processes, physical space, manpower, the infrastructure and the mindset of the staff, must be tailored around that setting.

The respondents noted that the staff component had been reduced at the library, but there are no machines replacing vacancies for easy navigation of the patrons. High tech signage, which should motivate and switch users' minds into a work mode, were highlighted by the respondents as extremely important. Meanwhile, the library has not fulfilled the mandate of providing ambiance that is due to students who are expected to produce quality research which would put the institution on the world map. Though the library has employed a new WMS, a one stop shop discovery tool, information retrieval and space, are a major concern for the respondents, pertaining to quality.

6.3.5 What skills are required in the library to embrace technological changes and improve services?

The respondents noted the lack of soft skills and continuous training as a setback in the provision of superb service to library users. It was pointed out that more trainings

were essential, as well as the employment of personnel who have expert knowledge in information technology, for the integration of systems throughout the departments. Supply chain management knowledge was found not to be known by the library staff, which is also the basis of unemployment of TQM and process re-engineering techniques.

6.4 Recommendations to solve the research problem

The findings and conclusions informed recommendations that would assist the library management to evaluate their processes, thereby crafting strategies that involve supply chain techniques to enhance the library's performance in terms of efficiency and effectiveness. This is so that the QoS offered by the libraries are enhanced to meet the expectations of users who have varying needs. For the services of the library to be effective with no or minimal hurdles, the staff must be well equipped with technological know-how and strategies that boost the image of the institution, available funds must be injected to projects that allow for dealing with changes in processes, technology and mindset or lifestyle of users. Lastly, it is essential to synchronise procurement processes in that funds are saved and rather utilised in critical areas of continuous improvement.

6.4.1 Third Party Logistics (3PL)

It was established from the study, that the library has unrevised procurement processes which are not clearly defined. The acquisition of books, online databases and CAPEX, could be outsourced to a more specialised department where processes would be streamlined accordingly. Academic libraries should consider making use of outsourced logistics to accelerate the transportation of interlibrary loans books. Also enabling online transactions in issuing books could improve the efficiency of the services of the library, just like how online shopping takes place, users should be able to order books from online and have those books delivered to them by private or insourced logistics service providers, attached with strict repercussions if books are not returned on time or at all, to successfully monitor their circulation. It is proposed that Service Level Agreements (SLA's) are invested in, as means to apprehend the QoS as required by digital users and mainly the commitment by the library to deliver digital services with the assistance

of digital service providers. This is deriving from the findings that libraries only specialise in library services and for them to thrive and be equipped for servicing the changing needs of the users.

The library disabled the use of an inbound binding facility and later, that of the outsourced binding service. These were activities that somehow supported the continuous improvement and their disbandment have led to the discarding of materials which could be repaired, and more costs are incurred for buying books, instead of allowing for repairs of old books to also take place. The researcher thus discusses the importance of having reverse logistics to ensure the sustainability of the unit.

6.4.2 Reverse logistics

The previous passage emphasised the importance of using third party logistics to ensure efficiency in delivering services to users who are the main business of the library. Alluding to the disbandment of binding services, the researcher recommends that library staff is introduced to reverse logistics processes. Since the respondents reported financial constraints as a major issue at the library, it is advisable that materials of the library are reused to capture their value and to allow for proper disposal. Therefore, libraries, from a procurement point of view, must educate itself and implement cradle to cradle operation for reverse logistics processes to be able to take shape, ultimately saving costs and sustaining the flow of the services. According to (McDonough and Braungart (2010)), cradle to cradle provides solutions for pollution and waste management caused by industrial design. Products and services should be intelligently designed in a way that optimises recyclability and renewability.

6.4.3 Research and Development (R&D)

The respondents reported the level at which processes are unrevised and the slow pace of implementation of the concepts that enhance services. Just like any other entity, academic libraries deal with users whose needs are changing over time due to different age gaps. If quality initiatives are not well researched, momentum would be lost, resulting in the credibility of the organisation being at stake, therefore, this calls for close monitoring. Change is already happening, universities should be already leading

it. It is thus recommended that the library staff undertakes research and Development (R&D) projects so that they are aware of changes that affect the operations of the library and tailor services according to relevance, as required by the environment.

(Neal (2006)) emphasise the importance of R&D, saying that:

"*Research is thorough investigation, experimentation focused on the discovery and interpretation of new facts, and the practical application of new or revised theories or laws. Development is making research results visible, available, and useful. R&D is thus solving real problems in real situations".*

The respondents reported how new facts had not been discovered about the environment in which the library operated, as well as the recipients of the services thereof. This is because the division has not invested in any R&D programs to get the plight of users relating to advancements in technology. It can thus be confirmed that organisations in the non-profit sector, as well as libraries, have not adopted R&D capacity and the norm must be revised.

That depicted libraries have a mandate to get an outside perspective, different views pertaining to the design of innovative ideas, products and services in mind, having an intrinsic value proposition. The call for R&D in libraries will enhance the relationship that co-exists between industries, *vis-a-vis* universities. The emphasis is on fast tracking interchangeability between sectors, more significantly breaching a disjuncture between the academia and enterprises. Universities discover prestigious findings through data analysis from conducting research. However, the outcomes of the research benefit universities less than corporate world. It is recommended that since universities are leaders in discovering new solutions and though on the same note, industries are the leaders in implementing solutions that broaden competitiveness, the two must join alliances through benchmarking, so that academic institutions are also on par with the rest of the world, in terms of sustainability and service delivery. This is essential, because data analytics, artificial intelligence, machine learning, robotics, big data and data mining and analysis, are the future. Therefore, innovative projects that take the robot out of the human are encouraged in preparation for the fourth industrial revolution.

Moreover, librarians should no longer be classified as librarians, but essentially as researchers in marketing, technology, design of services and other pivotal areas, as this will enable a broader contribution in terms of research skills exceptional to assist the institution to address the challenges and changes brought about by technology, economic outlook, political landscape and most importantly, the needs of the library clientele.

6.4.4 Risk management

The researcher recommends the stringent enforcements regarding safety and security of users around campus and the library parameters. Close circuit Television (CCTV) surveillance are recommended by the researcher, to closely monitor situations including that of arson during protests and mass action occurrences. An action plan to deal with internal and external threats to the facilities and services of the library should be designed by determining resources required to succeed in managing better still detecting probable threats. The respondents also reported that the library is not the safest place, as only one security guard is allocated to monitor eleven building floors, explaining that a lot of non-scholarly activities take place in the building, including eating, stealing of books and disruptions due to noise.

The UKZN libraries have taken an initiative and installed closed accesses system which scans and limits access to the library to registered students only. The researcher thus recommends that more security staff are deployed to monitor the activities of the library to ensure that it is conducive for learning. Staff retentions is a good attempt, as personnel accumulate expert knowledge. However, with the fast-changing technology, it is required that trainings and workshops are provided to personnel for re-skilling purposes. Having personnel who are outdated technologically is costly to a company, as other companies in the same industries would use technologies to beat competition. It is thus required that the library management prioritises on rethinking their model to allow for secured and transparent transactions, execution of controls up to 100%, quality assurance and data analytics. To avoid destructive patterns that lead to restructuring which occurred at the library, as respondents revealed, it is advisable to

adopt TQM as means of continually improving service quality and processes and workforce.

6.4.5 Turn-aways

Turn-aways at academic libraries can be a discouraging experience, as doing research is associated with time frames, quality references and the need to produce groundbreaking research. The issue of budgets has a ripple effect in that constraints in budget allocated to libraries lead to cancellation or no access to electronic databases and journals, which results in turn-aways and leaving researchers with no or little options to get the materials they require. The respondents mentioned ways in which the library management has incorporated some techniques and strategies to drive continuous improvement in the absence of enough funds to support the library. Pay per view and bundled articles were two alternatives enacted to support turn-aways caused by cancelled subscriptions due to funds or low usage statistics.

6.4.6 Triple bottom line reporting

Universities, just like other business entities, are not exempt from the triple bottom line reporting which considers people, planet and profit, though they are not regarded as profit making organisations. Sustainable procurement came at the fore at the Purchasing Consortium Southern Africa's (PURCO) three-day conference held in Gauteng from 24 to 26 October 2018. The themed conference above all aimed to ensure that universities adhere to sustainability standards on their engagements with suppliers, whose product offerings impact on the environment with negative or positive externalities. It is important to understand that the core business of the university is to drive a mission, rather than making a profit. However, the institution has the power to influence economic, financial and environmental sustainability of the country through the service level agreements with vendors. Be that as it may, the library nevertheless must be managed on sound university principles.

6.5 Implications of this research

The findings of the study, together with the presentation of the results, have added to the literature regarding the adoption of TQM and process re-engineering by academic

libraries in exchange for quality services. The results show that there is indeed a misalignment in library processes and supply chain techniques.

The results further showed that declining budget allocated to libraries is the root cause of stagnant growth in terms of technology, process re-evaluation and implementation and transitioning to a 21st century library.

Change management was discovered as a setback that has created a silo mentality among library staff. Library staff only focused on designated units without synchronising processes to gain synergistic benefits from the whole library workforce uniformly across all five campus libraries.

Another policy implication is that the policy-making process should include techniques outside the service sector and strategic planning must embed concepts which are benchmarked from all sectors, since all the sectors aim to satisfy clients while maximising the value of their existence.

6.6 Limitations of the study

The scope of the context of the research is only valid to the South African context, zooming into academic libraries of the UKZN. Therefore, the results from the study may only be valid in this context and sector. However, the results of the study may be extended to the same institutions within the sector, cautiously so, without generalisation of findings.

The interview questions were formulated in English when there are nine official languages in South Africa. English speakers may have had an advantage over non-native English speakers because they understood and interpreted questions better. That said, interview bias is inevitable in qualitative research.

Another limitation is that not all the managers were interviewed, which may limit the information that may have been useful to the findings of the study.

Finally, given the inadequate time and limited resources, the depth of the research and research outputs may have only scraped the exterior of the phenomenon, therefore the depth of the study may be explored.

6.8 Recommendations for future studies

Further studies could examine the perception of library users in connection with TQM and process re-engineering, as they are the recipients of library services.

The sample for this study only involved the UKZN libraries, it is recommended that the sample is stretched to include other academic libraries to gain more in-depth information, as well as to provide a more comprehensive representation of why supply chain techniques, including TQM and process re-engineering, are not fully employed by libraries.

The scope of the research project could potentially be extended to all other libraries, including public libraries and outside academia to other service companies.

The study only zoomed into library staff, further studies could be extended to the human resources, on recruitment of personnel who will implement supply chain techniques in library environments.

A research concept of more higher learning institutions could present trends in the education sector and permit a comparative study analysis especially on basis of ethnic group as old staff structures were constructed on racial grounds.

6.9 Conclusion

The findings of this study, literature and research objectives of this study showed that there has been significant progress in terms of the library operation on spheres of technology, integrated systems, automation and client orientation. Though the UKZN libraries have not reached a fully transformed model, they have to an extent tapped into services that embrace technology. There is a great level of understanding of user needs. However, the UKZN library, just like other libraries which have not adopted any of the supply chain techniques to decrease costs, improved efficiency has not yet benefited from the elements of TQM, including recognition, teamwork, leadership, effective communication and integrity. These elements have a potential of maximising the value of any organisation, including service sector organisations.

For the UKZN to meet the objectives of its strategic plan, it must align strategic goals with the library infrastructure required to be able to remain effective and efficient for servicing technologically savvy students. Procurement processes of the libraries must be streamlined in that costs of the library materials are kept minimal, yet enough to afford the library a quality service offering. Hard skills have significantly improved from the traditional setting to a virtual one and soft skills require constant improvement and attention, as librarians get to interact with patrons from all walks of life with a vast diversity.

The study showed that budgets were at the center of stalled growth in aspects including revising and implementing process re-engineering, transformation to the digital freedom and access to library content anytime, anywhere, using any device. Change management was also highlighted in that decades after, library personnel still do not view the library division as a one stop shop for the convenience of users. However, the silo effect has manifested into decentralised units which consequently prevent continuous improvement to successfully take place. It is indeed crucial that the library is aware of its environmental surroundings and how they contribute into the lifestyles of the users they serve. That explained, the library should thrive to satisfy the needs of every registered student at the university and potentially extending the footprint internationally.

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APPENDIX – 1a INFORMED CONSENT LETTER

Informed Consent Letter 3C

UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

Dear Respondent,

MBA Research Project
Researcher: Nontobeko Witness Mthiyane (0820428755)
Supervisor: Mr Christopher Chikandiwa (031 260 8882)
Research Office: Ms P Xuba 031-2603587

I am **Nontobeko Witness Mthiyane**, an MBA student, at the Graduate School of Business and Leadership, of the University of Kwa-Zulu Natal. You are invited to participate in a research project entitled **"Incorporating Supply Chain Techniques Including Total Quality Management and Process Re-engineering at the UKZN Libraries"**. The aim of this study is to:

To source ways to improve the services offered by the UKZN libraries by assisting management to be innovative using supply chain techniques in that the library is strategically aligned with the mandate of the institution using forever shrinking budgets.

Through your participation I hope to understand: **If the library is equipped to service 21st century students.** The results of the focus group are intended to contribute to:
To understand supply chain techniques instead of traditional way of operation, to improve procurement of library electronic resources, to explore a strong change management incorporating supply chain to library staff, to identify processes to deal with shrinking budgets of library essential materials, to use supply chain to understand skills to transform to a digital library.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this survey/focus group. Confidentiality and anonymity of records identifying you as a participant will be maintained by the Graduate School of Business and Leadership, UKZN.

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

The interview should take you about 45 minutes to complete. I hope you will take the time to answer the questions.

Sincerely

Investigator's signature [redacted] Date 06 / 08 / 18

APPENDIX 1b – INFORMED CONSENT LETTER

This page is to be retained by participant

UNIVERSITY OF KWAZULU-NATAL
GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

MBA Research Project
Researcher: Nonkobeko Witness Mthiyane (0820428755)
Supervisor: Mr Christopher Chikandiwa (031 260 8882)
Research Office: Ms P Ximba 031-2603587

CONSENT

I Nonhlanhla Ngcobo (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent 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.

I hereby consent/do not consent to record the interview.

[redacted] PARTICIPANT DATE

..... 24/08/2018

This page is to be retained by researcher

APPENDIX 2 – INTERVIEW SCHEDULE

UNIVERSITY OF KWAZULU-NATAL

GRADUATE SCHOOL OF BUSINESS AND LEADERSHIP

Master of Business Administration Studies Research Project

Researcher: Ms Nontobeko Witness Mthiyane (082 042 8755)

Supervisor: Mr Christopher Chikandiwa (031 260 8882)

Research Office: Ms P Ximba (031 260 3587)

Incorporating Supply Chain Techniques Including Total Quality Management and Process Re-engineering at the UKZN Libraries

Interview Questions

- Is there any misalignment between the library processes and supply chain techniques that can improve the service offering?
- What are the setbacks that may cause the library not to perform better?
- Which integrated supply-chain techniques support decision-making, technological changes and access to library essential materials?
- Does the UKZN library require any process re-engineering initiatives to stay competitive?
- What is the role of your position at the University of Kwa-Zulu Natal?
- Do you think lack of supply chain techniques cause some of the quality challenges at the library?
- Do you think change management can improve services of the library?
- Would you perceive the service of the library as suitable for 21st century students?
- What is the impact of journal cancellation to the university community?
- Is there a proper information flow addressing shrinking budgets?
- How frequently is an unsatisfactory service reported at the UKZN library due to lack of skills?
- What skills do you think will better address technological changes to suit user expectations?
- Are you satisfied with the service offered to the library clients?

APPENDIX 3: LANGUAGE EDITING LETTER

CONFIRMATION OF EDITING

30 November 2018

Re: LANGUAGE EDITING STATEMENT

I, THE UNDERSIGNED, hereby confirm that I have edited the thesis titled **Incorporating Supply Chain techniques including Total Quality Management and Process Re-engineering at the University of KwaZulu-Natal Libraries,** by **Nontobeko Mthiyane,** for the degree of **Master of Business Administration**

Regards

Professional EDITORS Guild

Hatikanganwi Mapudzi
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PhD (Communications), M. A (Journalism & Media Studies), PGDip (Media Management), B.Soc. Scie. (Hons) (Communications), B. Applied Communications Management (Distinction).

APPENDIX 4 – GATEKEEPER'S LETTER

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

16 November 2018

Ms Nontobeko Mthiyane (SN 210540770)
Graduate School of Business and Leadership
College of Law and Management Studies
Westville Campus
UKZN
Email: mthiyanen@ukzn.ac.za

Dear Ms Nontobeko Mthiyane

RE: PERMISSION TO CONDUCT RESEARCH

Gatekeeper's permission is hereby granted for you to conduct research at the University of KwaZulu-Natal (UKZN), towards your postgraduate studies, provided Ethical clearance has been obtained. We note the title of your research project is:

"Incorporating Supply Chain Techniques Including Total Quality Management and Process Re-engineering at UKZN Libraries."

It is noted that you will be constituting your sample by conducting interviews with academic and support staff in the UKZN Library and Information Services.

Please ensure that the following appears on your notice/questionnaire:

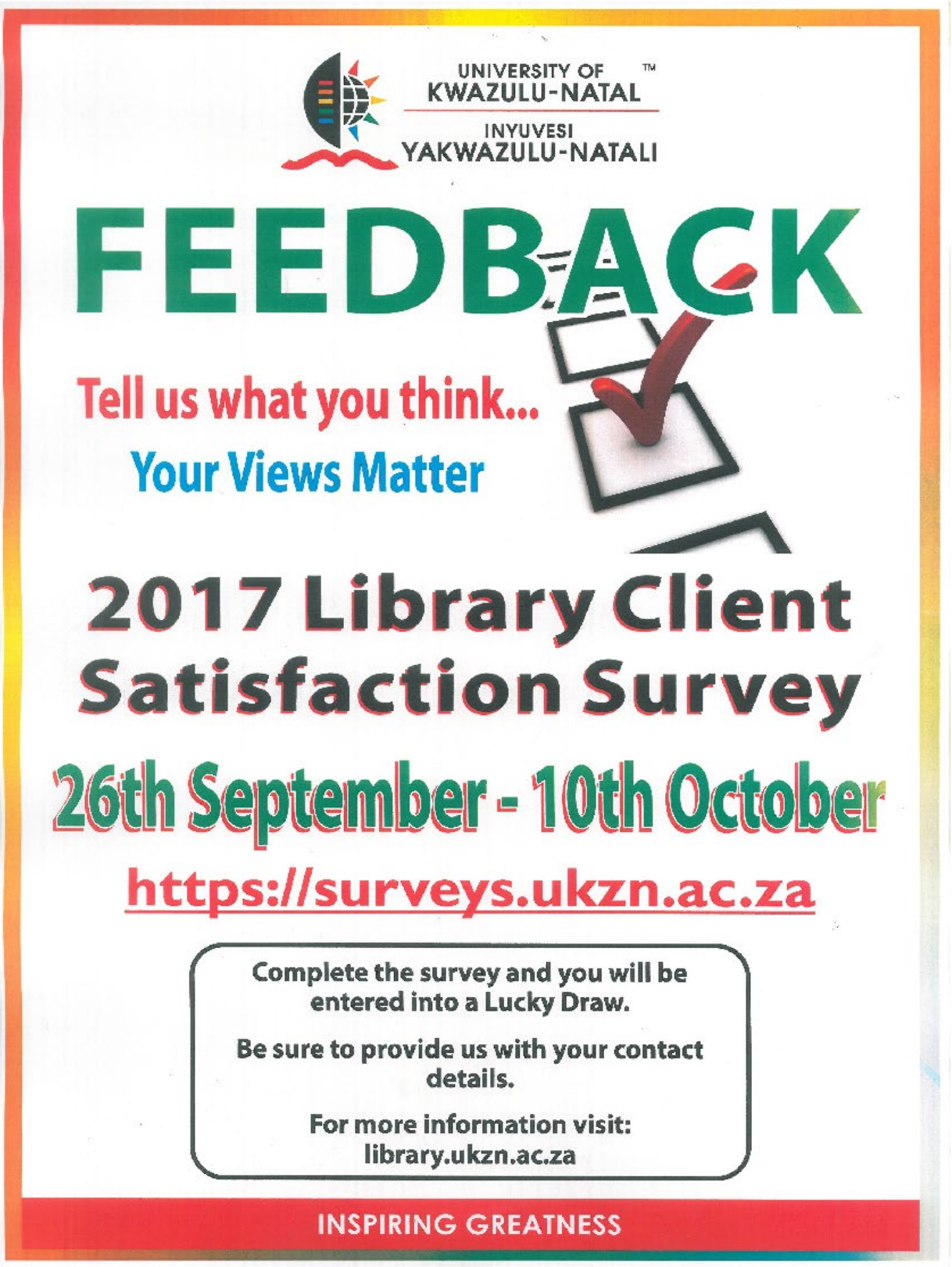
- Ethical clearance number;
- Research title and details of the research, the researcher and the supervisor;
- Consent form is attached to the notice/questionnaire and to be signed by user before he/she fills in questionnaire;
- gatekeepers approval by the Registrar.

You are not authorized to contact staff and students using 'Microsoft Outlook' address book. Identity numbers and email addresses of individuals are not a matter of public record and are protected according to Section 14 of the South African Constitution, as well as the Protection of Public Information Act. For the release of such information over to yourself for research purposes, the University of KwaZulu-Natal will need express consent from the relevant data subjects. Data collected must be treated with due confidentiality and anonymity.

[redacted]

MR SS MOKOENA
REGISTRAR

APPENDIX 5 – LIBRARY CLIENT SATISFACTION SURVEY



APPENDIX 6 – ETHICAL LETTER

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

21 August 2018

Miss Nontobeko Witness Mthiyane 210540770
Graduate School of Business and Leadership
Westville Campus

Dear Miss Mthiyane

Protocol Reference Number : HSS/1023/018M
Project title: Incorporating Supply Chain Techniques including Total Quality Management and Process Re-engineering at the University of KwaZulu-Natal Libraries

Full Approval – Expedited Application

In response to your application received 19 July 2018, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

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.

Yours faithfully

[redacted]
uka Singh (Chair)
Humanities & Social Sciences Research Ethics Committe

/pm

Cc Supervisor: Christopher Chikandiwa
cc Academic Leader Research: Professor M Hoque
cc School Administrators: Ms Zarina Bullyraj

APPENDIX 7– TURNITIN REPORT

MBA Dissertation 2018 Final Draft

ORIGINALITY REPORT

2%	1%	0%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

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