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Difficulties towards risk management implementation: small contractors in the South African construction industry

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A Research Report

Presented to

Faculty of Engineering and the Built Environment, School of Construction, Economics and Management, University of the Witwatersrand, Johannesburg

In partial fulfillment of the requirements for the

MASTER OF SCIENCE IN BUILDING

DIFFICULTIES TOWARDS RISK MANAGEMENT IMPLEMENTATION: SMALL CONTRACTORS IN THE SOUTH AFRICAN CONSTRUCTION INDUSTRY

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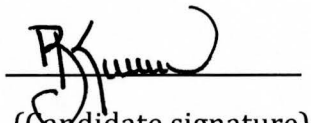
Supervisor: Lungie Maseko

Johannesburg, September 2019

DECLARATION

I declare that this is my own work.It is being submitted to the Degree of Masters of Building Science to the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination to this or any other University.



(Candidate signature)

9 Sept 2019

Date:

ACKNOWLEDGEMENT

Firstly, I would like to thank the Holy Trinity for His presence throughout this project. Undeniably, the accomplishment of this project bears witnesses that," I can do all things through Christ who strengthens me", (Philippians 4:13).

Secondly, to all the friends I made through this report. To my colleagues (Pearl Moalusi & Lindelwa Mazibuko) who lent a hand and kept me motivated to complete this research report successfully. My report mentor and supervisor Ms. Lungie Maseko for her patience, direction and knowledge impartation she provided to enable me to navigate my way around this report.

My sincere thanks to the Gauteng Department of Human Settlement for the opportunity to further my studies, through such an institution built on principles of intellectual excellence, internationally competitiveness and striving on high quality academic standards gateway (University of Witwatersrand- School of Construction, Economics and Management).

And lastly my father Beatus Mandlenkosi Kunene and my siblings Khumbu, Ntokozo, Mthobisi for their selfless support to ensure that this piece of work becomes a great success. Not forgetting my oxygen, my son Fezile Kunene who by his presence has propelled me to burn the mid-night oil in order to see this dissertation through.

DEDICATION

I would like to give my deepest appreciation and thanks to my late mother Mrs. Veronica Ntombizodwa Kunene *(May the Good Lord, shine unto her thy perpetual light and grant her everlasting life*). RIP "ntombazane" as I would always call you.

Miss Bongekile Kunene
August 2019

EXECUTIVE SUMMARY

ABSTRACT

Objectives of the study

This comprehensive study was carried out to investigate the state of Risk Management (RM) implementation within the South African Industry, explicitly on the perspective of small contractors.

To achieve this, the following objectives were surveyed:

- To identify risks types related to small contractors in South Africa.
- To identify the major difficulties to successful implementation of risk management by small contractors in South Africa.
- To determine risk management processes related to small contractors in South Africa.

Methodology

A mixed method approach was adopted in this research study, based on a cross sectional survey of small contractors registered under the Gauteng Department of Human Settlement Incubator program (Gauteng-South Africa) database. Questionnaires were formulated and distributed to 19 small contractors. A total number of nineteen questionnaires were distributes among the small contractors and only 18 were returned which translated to 95% response rate. Akiyonte and Fitzgerald (2000) underscored that the average acceptable response rate is between 20-30%, which makes a response rate for this treatise acceptable. The data used in this study was derived from both primary and secondary sources. The primary data was collected between June 2018 and August 2018. Secondary data was derived from academic journals, library books and conference papers between April 2018-March 2019.

Findings

A survey questionnaire was administered and distributed to 18 owners and/ or managers of SMME's that are registered under the GDHS Incubator program database-Gauteng in South Africa. The findings of this study did not differ to previous studies.

Respondents perceived putting a risk management plan in place not feasible, complex and expensive. The key difficulties towards RM implementation revealed results that the key difficulties are: a) complexities of analytic tools and b) low profit margins.

The analysis of information collected gave an indication of a thirty-three percent of projects without RM in place, with seventeen percent of respondents currently in progress with put RM plan in place. A further forty-four percent of small contractors sampled in this survey had a risk management plan or system in place on their projects. Hundred percent of respondents agreed that RM is a vital component when implementing projects and hundred percent agreed that implementation of RM in their projects provided a positive impact on the triple PM constraint. Ninety-five percent of respondents agreed that RM is a growth catalyst on their projects which verified a convincing awareness of RM as a knowledge base area amongst SMME's. However, on projects with RM in place, small projects indicated late completion of projects but on a smaller scale than on projects without. These findings further confirmed the hypothesis of this study to be true which was to test if RM implementation had a positive impact to SMME's growth and sustainability.

Originality and Value

The issue surrounding the status quo of risk management implementation by small contractors has not been comprehensively studied under the insight of small contractors within the South African construction Industry. This research aimed to address the gap identified on areas which were previously not covered by other researchers. These identified gaps prompted evaluation of the key difficulties in the implementation of risk management

amongst SMME's in the South African construction industry through a survey which was designed and developed on a broad literature review of SMMEs. Key difficulties identified in this research report can be considered to contribute to the body of knowledge and can be considered to facilitate RM process within SMME's.

Keywords:

Risk Management, Difficulties/Barriers/Hindrances, Construction Industry, SMME's, South Africa.

GLOSSARY OF TERMS AND CONCEPTS

Response rate: The total number of responses divided by the total number in the sample after ineligible participant's responses are excluded.

Impact: The effect on the project or its objectives, measured in terms of safety, cost, schedule delay, quality of construction or another requirement (+ or -).

Probability: Chance of a risk event occurring.

Risk: Combination of impact and probability.

Risk Event: A discrete occurrence that may affect the project for good or bad.

Risk Averse: Someone who does not want to take risks.

Problem or Uncertainty: An uncommon state of nature, characterised by the absence of any information related to the desired outcome.

Risk Management: The process involved with identifying, analysing and responding to risk.

Residual Risk: Risk remaining after initial risks are addressed.

Consequence: An outcome of an event and effect on objectives.

Likelihood: A chance that something might happen, it can be addressed qualitatively or quantitatively using a mathematical method.

Inherent Risk: Risks that exist based on the general characteristics of the project, these risks can be low or high levels of risks.

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ABBREVIATIONS AND ACRONYMS

GDHS	Gauteng Department of Human Settlement
SMME(s)	Small Medium Micro Enterprise(s)
CIDB	Construction Industry Development Board
Et al	and others
SA	South Africa
RM	Risk management
R & D	Research and Development
SEDA	Small Enterprise Development Agency
SEFA	Small Enterprise Finance Agency
NYDA	National Youth Development Agency
TIA	Technology and Innovation Agency
NEF	National Empowerment Fund
DTI	Department of Trade and Industry
GEM	Global Entrepreneurship Monitor
RBS	Risk Breakdown structure
WBS	Works Breakdown Structure
OAM	Overberg Asset Management
JSE	Johannesburg Stock Exchange
R&D	Research and Development
BER	Bureau for Economic Research
IRMSA	Institute of Risk Management South Africa
CPM	Critical Path Method
PRM	Project Risk Management
NHBRC	National Home Builders Registration Council

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CHAPTER 1: INTRODUCTION

1. INTRODUCTION

"No construction project is risk free. Risk can be managed, minimized, shared, transferred or accepted. It cannot be ignored". ***Sir Michael Latham 1994***

The increasing failure of small construction projects in achieving objectives puts risk management high on the agenda for forward thinking organizations. Shunmugan and Rwelamila (2014) noted in their study that this concept has been a subject for serious academic scrutiny.

1.1. OVERVIEW

Construction projects are unique and cyclical in nature Neejah, (2011). They are characterized by their inherent milieu of risk, time and cost overruns. Unlike other industries, the construction projects as a result have suffered poor project performance and an unfavorable underperformance reputation (Wood, *et al.,* 2002; Rostami, *et al.,* 2015; and Iqbal *et al.,* 2015). However, the industry has time and time again demonstrated a reputation to under scrutinize risk management as an underlying factor for this plethora of consequences Nawaz, *et al.,* (2019).

Many authors such as (Perry and Hayes, 1985; Flanagan and Norman, 1993; Turner, 1999; Zou Patrick, *et al.,* 2006; and Nawaz *et al.,* 2019) have highlighted that in order to achieve project objectives in terms of the infamous construction triple constraints, organizations must encompass the RM methodology. Round and Segner, (2011), emphasized on the importance of RM implementation as a critical factor that can assist organizations to complete projects successfully. Chilese and Kikwasi (2013), highlighted that RM implementation and assessment practices are troubled with difficulties. An efficacious risk management approach is vital on achieving project objectives as supported by (Serpella, *et al.;* 2014 and Nawaz, *et al.,* 2019).

Furthermore, the fundamentals of RM implementation rely squarely on the comprehension of risk.

1.2. FRAMEWORK OF THE STUDY

The framework of this study commenced with the formulation of the research problem as articulated from preliminary literature review. The research questions were an output of preliminary literature review. The fundamental concepts related to risk management implementation, risk types and RM processes formed an empirical research reviewed to determine existing practices within the built environment fraternity. The research methodology was then described, followed by the study's results and findings in discussions. The axis of this study revolves around the objectives set to address the research question the researcher is attempting to answer. Lastly recommendations and conclusions were made. The research results reported in this study is based on a comprehensive study conducted by the researcher.

1.3. THE PROBLEM STATEMENT

The problem investigated in this research report is the status quo of risk management implementation amongst small contractors within the South African Industry. The construction industry plays a very vital role in turning the country's economy but recently the SA's economic growth has shown signs of being stagnant. This can be traced back to stem from the difficulties faced by the industry. These difficulties facing the construction industry during the recent recession have brought RM to the fore in the wider scholarly dialogues, hence has led to the quest to seek answers to the following question:

- What are the key difficulties to successful implementation of risk management faced by small contractors in South Africa?
- What types of risks are related to small contractors in South Africa?
- Which risk management processes are followed by small contractors in South Africa?

However, literature gap was identified which focuses clearly on RM implementation on small projects in the South African construction industry. This study is setting out to have an input in addressing the gap identified.

1.4. AIM OF THE STUDY

The aim of this study is to identify the key difficulties that SMME's are faced with when implementing RM in the South African construction industry.

1.5. OBJECTIVES OF THE STUDY

To provide answers to the research questions and achieve the aim of the research, the following objectives were set:

- To identify the key difficulties to effective implementation of risk management by small contractors in South Africa.
- To identify risks types related to small contractors in South Africa.
- To determine risk management processes related to small contractors in South Africa.

1.6. SCOPE OF THE STUDY

This investigation was conducted to identify the key difficulties in risk management implementation as perceived by small contractors within the South African construction industry.

The main sources of theoretical information, although it was found to be very limited, were from scientific papers, books and published/peer reviewed journals. The empirical study to support the findings from the literature were from a targeted population sourced from the Gauteng Department of Human Settlement database (Incubator program), who are small contractors registered with the Construction Industry Development Board, under Grade 1-5 GB and CE with an experience of between 0-10 years in business.

1.7. RATIONALE OF THE STUDY

This research is relevant to policy makers, academics, risk practitioners, project managers, contractors and any other stakeholders in the built environment space who are concerned with prioritization of risk management integration throughout the project life cycle. The results of this study could assist small contractors in the attempt to embed risk management when implementing their projects. Organizations such as Institute of Risk Management of South Africa (IRMSA) could also benefit from the results of this study to provide with SMME's insights currently a hindrance when SMME'S are implementing RM on their projects.

The issue addressing key difficulties towards risk management implementation exclusively for small contractors within the South African construction industry has not been comprehensively researched. This research paper aims to cover comprehensively on areas which were previously not covered by other researchers, furthermore to provide a platform for small contractor's perspective on the difficulties experienced when implementing risk management on projects. These difficulties threaten their industry resilience, sustainability and competitive edge, especially during an unpredictable and volatile market or economy and political state of the country.

1.8. ASSUMPTIONS

It was assumed that:

- Study participants have a basic understanding of the fundamentals of project risk management.
- Small contractors have relatively similar information regarding the market state of the country.
- The sample of participants will be representative of the majority of a small scale contractors' population in the South African construction Industry.

1.9. HYPOTHESIS

Mouton, (2001) defines a hypothesis as a "statement that makes a provisional or conjectural knowledge claim about the world". Therefore, the research hypothesis can be described as a statement that is formulated as a possible solution or response to the problem question, without knowing whether there is any empirical evidence to accept it as true. The hypothesis for this treatise is as follows:

Difficulties towards RM implementation experienced by small contractors in SA are an underlying factor to projects not completing on time. These difficulties towards RM implementation subsequently become an impediment to SMME's growth and success.

1.10. DELINEATIONS

The study made the following delineations:

- Research was limited to decision makers (owners/managers) in small construction firms.
- The research was only conducted using the small contractor's database of the Gauteng Department of Human Settlement (Incubator program) who are registered with CIDB.
- Research data were limited to Grade 1-5 (GB & CE) contractors in the GDHS small contractor database.
- Study focused on the awareness of RM and what constitutes as key difficulties towards RM implementation by SMME's in SA.

1.11. LIMITATIONS

The current research limitations are:

- Literature on SA's small contractor's implementation of risk management was identified to be very limited.
- The research report drew conclusion on the findings from the sample group's view on key difficulties towards RM implementation.

1.12. ETHICAL CONSIDERATIONS

The researcher during collection of data, ensured that all possible ethical considerations are adhered to. Proper consent was sought from the 18 respondents representing 18 construction firms, who are owners and registered in the GDHS-incubator program database before the semi-structured questionnaires were distributed. No pressure was applied to anyone to participate. Respect on people's privacy or intrusion of privacy was considered and no harm was caused during the process. No sensitive details on the respondent's personal details or project information was requested on the questionnaire. Integrity and objectivity were applied when explaining the intention of the study to the respondents. The researcher ensured relevancy of material to the study and recognition was given to the authors during literature review by citing accordingly.

Ethical clearance was sought and obtained from the relevant Faculty at the University of The Witwatersrand.

1.12.1. DEBRIEFING

Saunders *et al.,* (2016) defined debriefing as the process where once an observation or survey has taken place, the persons affected by the observation should be given feedback on the outcome of the observation. A clause on the consent form was attached to address this and it stated that participants are more than welcome to request any information pertaining to the survey after submission to the institution was conducted.

1.13. OUTLINE OF THE CHAPTERS

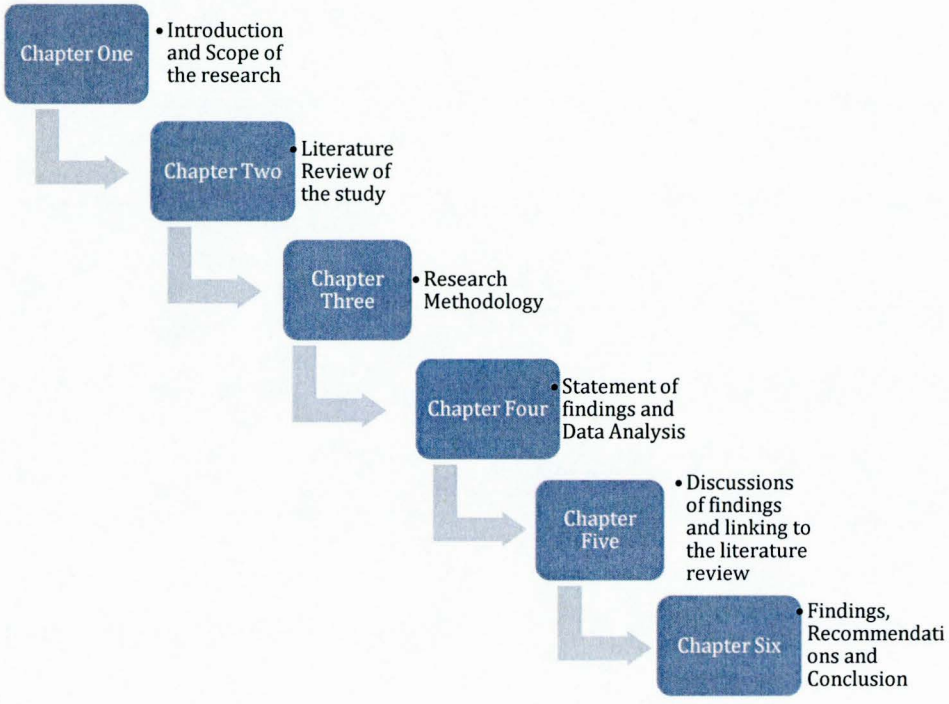


Figure 1: Outline of Chapters

1.14. CONCLUSION

Chapter one lead the subject of the research study and gave an understanding to the structure of the study, the background of the study and the position of the study. Chapter one also elaborated on the information of how the research report was to be presented. The next chapter (Chapter 2) focuses on the literature review from a South African context and on a global context.

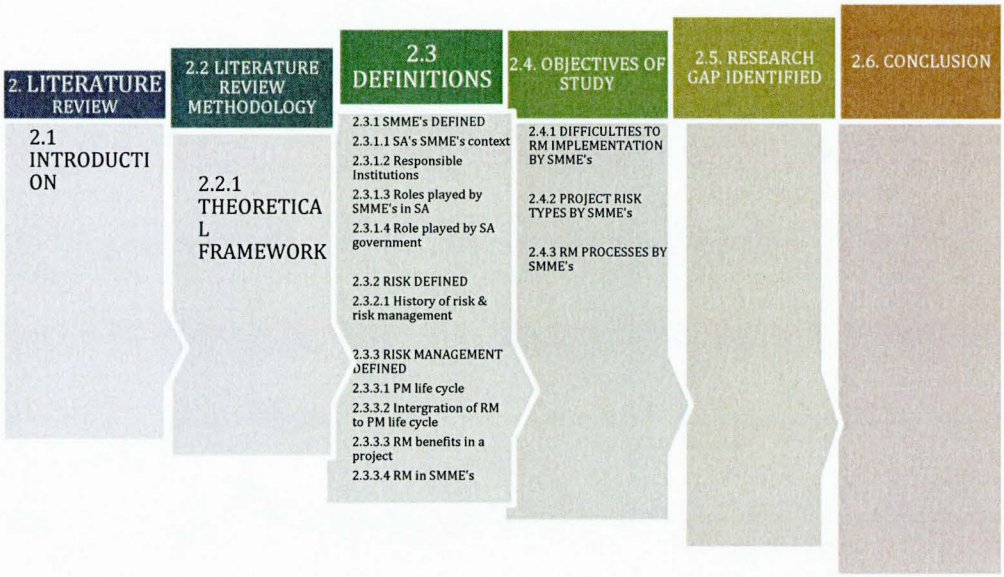


Figure 1.2: Detailed layout of Chapter 2-A literature review

CHAPTER 2: LITERATURE REVIEW

2. INTRODUCTION

This chapter discusses the approach embarked in the sourcing of literature to be appraised in this study. It appraises what academics have written about the subject area both in South Africa and in the international accolade. It describes the work of previous researchers (accredited, peer reviewed scholarly articles, dissertations, journals and books) and it critically analyses the contribution of others with the view of identifying similarities and contradictions made by previous researchers.

Over the years several researchers have discussed the concept of RM including the various risk management processes, project risk types and recognition of risk management as a knowledge area in project management but little attention has been given to discussing key difficulties faced by small contractors when implementing risk management in projects. This study seeks to draw attention to the key difficulties in risk management implementation faced by small contractors in the South African construction industry particularly during the current economic status of the country.
Therefore, the focal point of this study attempted to cover research objectives as the axis in the current treatise.

a) The key difficulties to successful implementation of risk management by small contractors in South Africa.
b) Risks types related to small contractors in South Africa.
c) Risk management processes related to small contractors in South Africa.

2.1. METHODOLOGY OF THE LITERATURE REVIEW

2.2.1. SYSTEMATIC LITERATURE REVIEW

In this study the researcher conducted the literature review in a systematic manner:

Parahoo (2006) suggests that a systematic review should detail the time frame within which the literature was selected, as well as the methods used to evaluate and synthesize findings of

the studies in question. In order for the researcher to assess the reliability and validity of the review (see figure 3), the researcher desired to present the precise criteria used to: (a) Formulate the research question; (b) Set inclusion or exclusion criteria; (c) Select and access of the literature; (d) Assess the quality of the literature included in the review; (e) Analyze, synthesize and disseminate the findings as below illustrated in Figure 3:

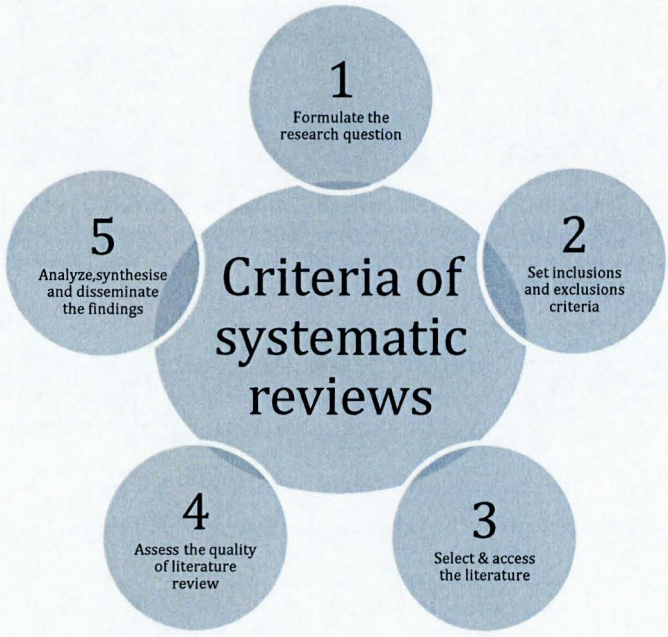


Figure 2.1: Criteria of systematic reviews

Adapted from Apine and Valdez (2016)

The literature review included analysis of electronic sources of information centered on the topical areas. The initial literature sources comprised of five journals from two journal publishers (Science Direct, Pro-quest) and from one search engine (Google Scholar). Other 2 sources were then identified on an ongoing process that added value to the current topical research. These following journal publishers were utilized:

a) **Science Direct,**
b) **Compendex,**
c) **Pro-quest,**
d) **Researchgate**

It must be noted that the above-mentioned electronic sources were chosen on the bases that they are peer reviewed and ostensibly had relevant articles pertaining to implementation of risk management.

The keywords used in this search were:

"Risk Management, Difficulties/Barriers/Hindrances, Construction Industry, SMME's, and South Africa.

The search returned with approximately +1390 results. The search was then refined to focus on SMME's or small contractors in construction. The number then reduced to 343 articles, explicitly for Risk Management in construction, not necessarily on SMME's in SA but globally. Only 41 articles on Risk Management were found for construction SMME's in the global construction Industry.

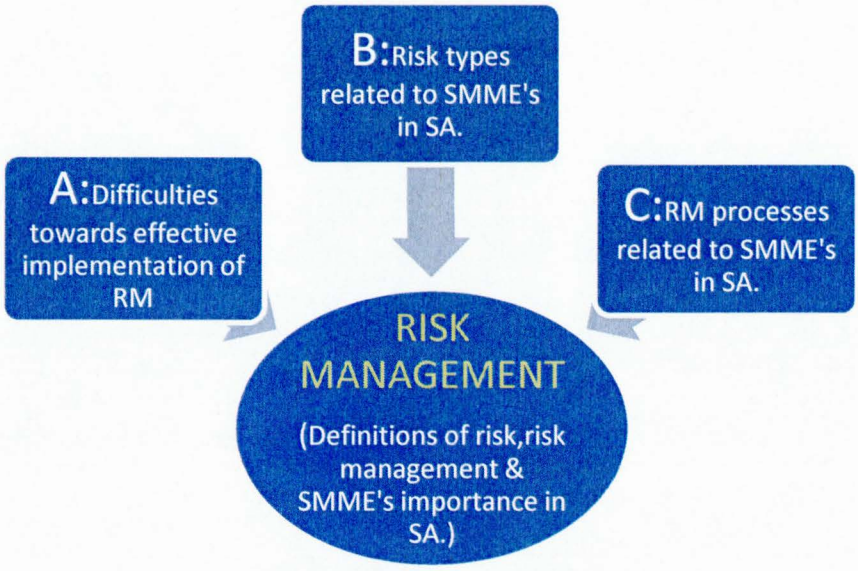
Of the 4 journal publishers that were utilized as sources, only 41 relevant articles were considered partly or relevant to the area of study.

2.2.2. THEORETICAL FRAMEWORK

Theoretical framework for the research report provides a convenient model for conducting research and analyzing research results. This framework provided a lens through which the researcher interpreted the primary data and findings thereof.

Daud and Yazid (2009) stated that literature advocates that several factors influence risk management implementation in organizations and the latter statement was recently concurred by Nawaz *et al.,* (2019) on their research of RM evidence in Pakistan. Based on the review of literature, a systematic inferential approach to attaining answers was adopted in this treatise by setting a framework structure of the study on objectives as the axis of this research report. The areas depicted in Figure 2.2 as shown below denote the main discourse topics throughout the treatise.

Figure 2.2 Research Model



The areas depicted in Figure 2.2 denote the main discourse topics covered throughout this treatise. This model was adapted to assist the reader to navigate the main areas central to the concept of RM identified in the current study.

2.3. DEFINITIONS

2.3.1. DEFINITION OF SMME'S

Dlungwane and Rwelamila, (2005) defines small construction companies in South Africa as companies with an annual turnover of less than ten million Rands (R10 million), while medium-sized contractors have a turnover ranging between ten million Rands (R10 million) up to fifty million Rands (R50 million). On the other hand, Department of Trade and Industry, (2007) defines small contract construction companies as SMME's and the word encompasses a very broad range of firms, some of which includes formally registered, informal and non-VAT registered organisations. DTI, (2007) guidelines classify SMME's in the construction industry using the number of employees, annual turnover and value of assets to categories the entities as depicted in Table 2.1, below illustrated.

Table 2.1: Definition of contractor size

Contractor size or class	Total full-time equivalent of paid employees (less than)	Total Annual turnover (less than)	Total Gross Asset Value-Fixed Property excluded (less than)
Medium	200	R 26 000 000.00	R 5 000 000.00
Small	50	R 6 000 000.00	R 1 000 000.00
Very small	20	R 3 000 000.00	R 500 000.00
Micro	5	R 200 0000.00	R 100 000.00

Sourced from DTI (2007)

According to the National Small Business Act No. 102 of 1996, an SMME is defined as a separate and distinct business entity, which is managed by one or more owner(s), which conducts its business in any sector and is depicted below in **Table 2.2**

Table 2.2 Definition of contractor size

Contractor size or class	Total full-time equivalent of paid employees	Total Annual turnover (less than)	Total Gross Asset Value-Fixed Property excluded (less than)
Small contractor	50	R 7,50 million	R 1, 00 million
Very small contractor	20	R 2, 00 million	R 0,40 million
Micro	5	R 0, 15 million	R 0,10 million

Sourced from SA Government's office (1996)

Berry, (2002) when defining SMEs, an emphasis is made on the importance to differentiate between small, micro and medium- sized enterprises (SMME's). Although both terms are used to refer to small businesses, SMME's comprises of a wider range of firms, from "established businesses employing over one hundred employees to self-employed owners of informal micro- enterprises".

In this study the words "SMME's" "SME" and "Small Contractors" will be used interchangeable but will mean one and the same thing and this is based on a varied definition and a lack of agreement amongst researchers about what constitute small, micro and medium- sized enterprises (SMME's) and as underpinned by McAdam and Reud, (2005).
According to DIT, (2007) small contractors are defined as enterprises that employ 50 or less permanent employees. In this in this research report an in-depth attention will be given to small contractors/enterprises with (50 and less permanent employees) registered under the GDHS incubator program, 1-5 GB/EC in the CIDB database and as depicted above in Table 2.2 and below in **Table 2.3**

Grade (GB & CE)	Maximum value of a contract	Largest contract completed in the past 5 years
1	R 200 000	No Requirement
2	R 650 000	R 130 000
3	R 2 000 000	R 450 000
4	R 4 000 000	R 900 000
5	R 6 500 000	R 1 500 000

Table 2.3 represent the contractor grading and contract value relation as recorded in the Construction Industry Development Board Regulation of 2008.

2.3.1. SMME's IN A SOUTH AFRICAN CONTEXT

The South African government recognises the importance of this segment of business activity, so much so that a new Ministry of Small Business Development was established in early 2014. The aim of the Ministry is to facilitate the promotion and development of small businesses. DIT, (2008) reinforces that these enterprises contribute significantly to national GDP and have proved to be major contributors to job creation.

Government policy on South African SMME development was initially documented in the 1995 White Paper on SMME development. The Integrated Small Business Development Strategy provided an action plan with focus on:

1) increasing financial and non-financial support,

2) creating a demand for the products and services provided by the SMMEs and

3) reducing regulatory constraints DTI, (2008).

In line with this action plan, the government established several institutions which would be responsible for the implementation of small business development strategy DTI, (2008).

2.3.1.2. INSTITUTIONS RESPONSIBLE FOR SMME's PROMOTION AND DEVELOPMENT

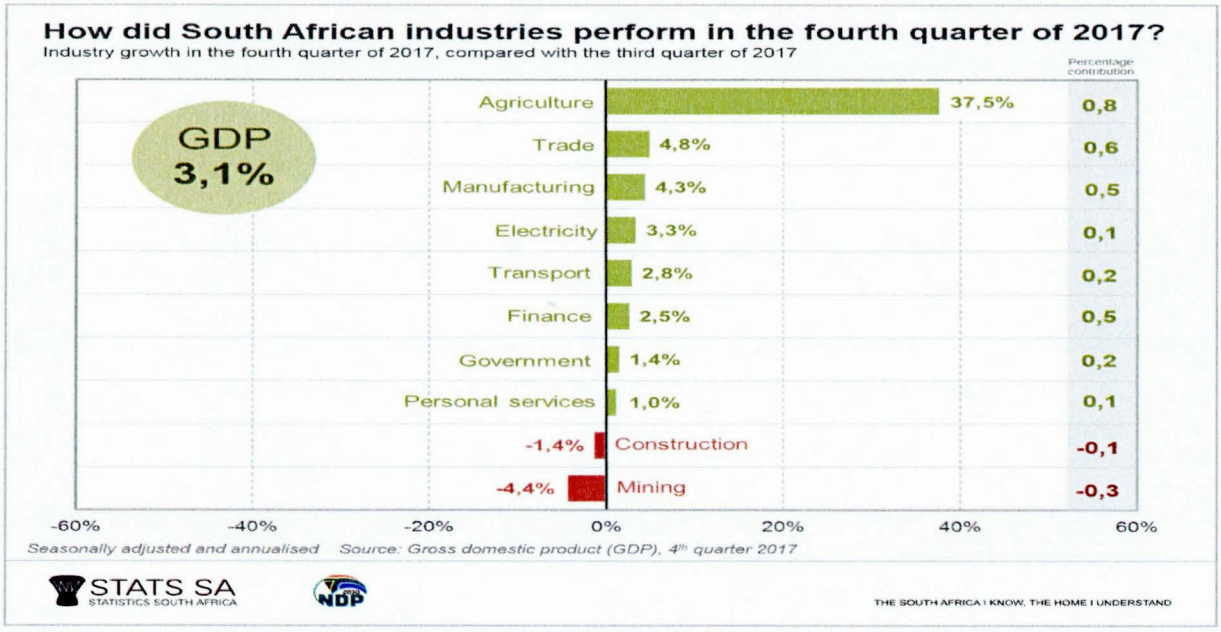
- The Small Enterprise Development Agency (SEDA)-This agency was established in December 2004 by the Department of Small Business Development, through the National Small Business Amendment Act (Act 29 of 2004) and its mandate is to design, implement and integrate government's small business strategy to support all tiers of government.
- The National Youth Development Agency (NYDA)- This agency was established to assist financial to start- up businesses by the youth of South Africa, whether on new or existing businesses.
- The Small Enterprise Finance Agency (SEFA)- This agency is a consolidation of 3 entities i.e. (South African Micro Finance Apex Fund (SAMAF) and Khula Enterprise Finance Limited to cater for bridging finance, revolving loans, asset finance and working capital needs of up to a limit of R3 million.
- The Technology and Innovation Agency (TIA) – This agency was established by the Department of Science and Technology and is also a consolidation of seven entities, its mandate is to enable and support technological innovation as well as enhance the global competitiveness of South African businesses.
- The National Empowerment Fund (NEF) – was founded with the intention of offering financial and non-financial support to black empowered businesses.

2.3.1.3. THE ROLE AND IMPORTANCE OF SMME'S WITHIN THE SOUTH AFRICAN CONTEXT

Kerper, (2000) and Aigbaboa, *et al.,* affirmed that small contractors play a significant role in any country's economics and are considered as an entry point of the unskilled workforce within the construction industry. According to the European Union (2014), a ninety-nine percentage of financial accomplishments can be traced back to SMME's performance, consequently accounting to approximately two thirds of all jobs in the public/private sector and was supported by Gama and Geraldes (2012); Burgstaller and Wagner (2015). It is then an undisputable fact that SMME's play an important role in the South African economy Siwangaza, *et al.,* (2014). Berry, (2002) noted that in South Africa, a large majority of SMMEs are concentrated on the very lowest end, where survivalist firms are.

Fin 24, (2018) predictable that, "*Of all the sectors on the JSE, the building and construction sector is probably the most cyclical and most volatile*". Overberg Asset Management (2018) analyst indicated that the caliber of overseas investors in the sector, suggested a significant potential in the South African construction Industry even though Fitch and S&P (credit rating agencies) were keeping SA in the junk status whereas on the other hand Moody's (credit rating agency) believes that the Ramaphosa factor has a "positive credit" result which may contribute to a recovery in South Africa's credit profile, boosting investment and growth.

What then is the stance of South African SMME's during this volatile state of the country's economy? There is a contradiction when looking at the current discourses within the industry and this view is based on the following extracts depicting the South African Industries growth performance during the 4th quarter of 2017 compared with the 2nd quarter review which indicates a substantial drop in the country's GDP.

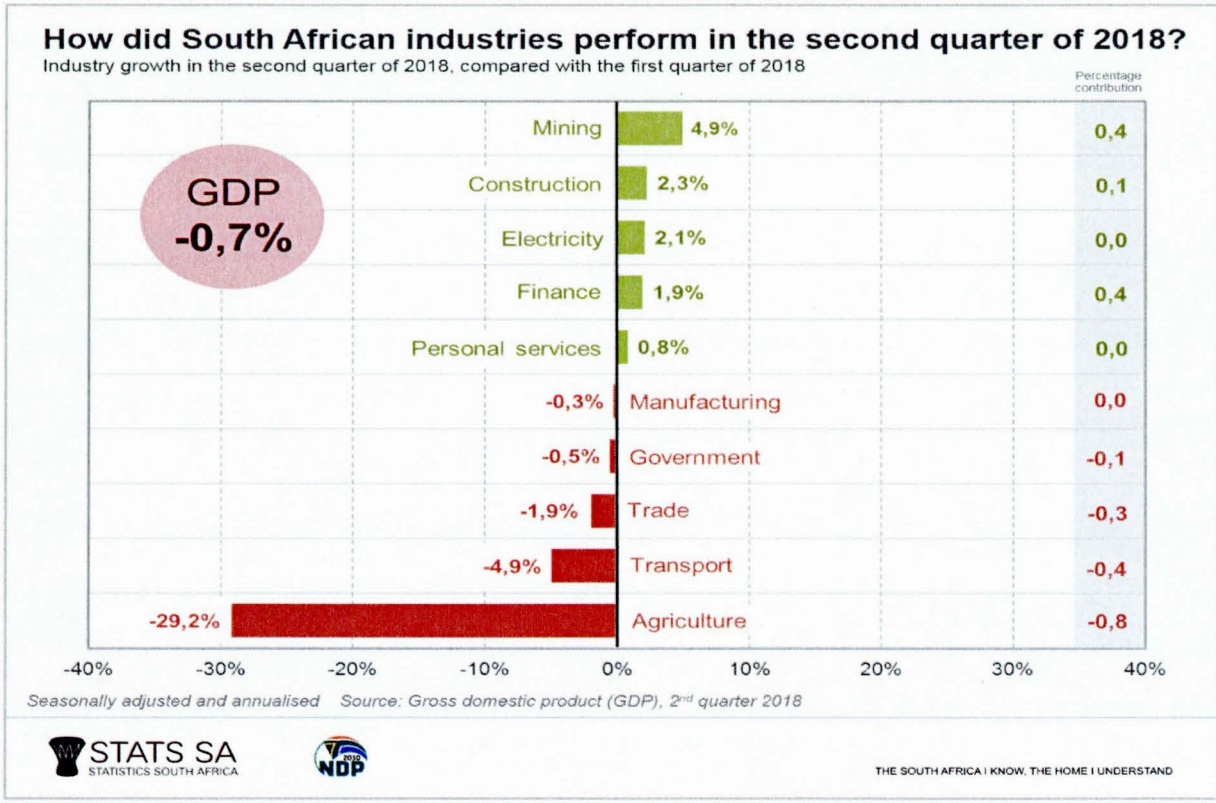


Sourced from STATS SA (2018)

Figure 2.3 South Africa's GDP indication,4th quarter 2017

Observations above reflects the recent available statistics as recorded in the **STATS SA,2018** published at the end of the 4th quarter 2017. The South African GDP recorded at a positive 3,15 with a fall of 1,4% in the construction industry performance. These indicators have displayed a disturbing fall in the investment margins. The construction sector appears to be sliding on thin ice with a technical recession which poses a higher risk to the sustainability of SMME's within the South African construction Industry.

The following extract depicts the performance the South African Industries during the 2nd quarter of 2018. These mid-year records as recorded in the STATS SA,2018 reflect the most recent statics.



Sourced from STATS SA (2018)

Figure 2.4 South Africa's GDP indication,2nd quarter 2018

On this quarter review, observations were made on the statistics recorded a fall of 0,7% with a slight rise of 2,3% in the construction industry performance. The 0,7% GDP downturn in the second quarter of 2018 was a result of a fall-off in activity in the agriculture, transport, trade, government and manufacturing industries STATS SA, (2018). On the bases if the above statistics, 2017 was a challenging year for the construction industry. By September 2017, confidence was at its lowest level since the third quarter of 2005. Weak growth in construction activity, pegged at just 3% year-on-year, and a contraction of around 1% in the value of spending, contributed to poor growth. Nonetheless, the past two years haven't been entirely without reason for optimism. According to a report by *Statistics South Africa*, the number of building plans passed in 2016 rose by 6% compared to the previous years, and the total value of newly constructed buildings grew by 8.3%.Furthermore,the CEO of Inyatsi Construction Group Holdings, Tommy Strydom, predicted that in 2018, the South African construction industry will display a positive economic growth and will continue embracing cost-saving measures in order to remain competitive. This recent projected positive

construction industry growth rate can be partly credited to the "Ramaphosa factor", as mostly referred to within the industry. Looking at the above evidence, it seems not all is lost with SMME's sustainability, with the turning of tides as predicted by Tommy Strydom. According to Lavia-Lopez and Hielb, (2014) small contractors are considered to have a simpler internal organizational structure and are flexible to respond and adapt to changes, even during the pressures in the country's economy.

2.3.1.4. ROLE PLAYED BY THE SOUTH AFRICAN GOVERNMENT IN THE UPLIFTMENT OF SMME's

Since the country's democratic establishment in 1994, the South African government, has been proactively spearheading the transformation in the South African construction Industry. This has been done by investing in small business developments which assists SMME's to remain competitive and sustainable. Rashaad, *et al.,* (2013) echoed that democracy in South Africa promoted the development of SSME's as Masutha and Rogerson, (2014) asserted that SMME's formed the foundation of the National Development Plan in South Africa.

On the 4th of March 2016, the former Minister of Public Works, former Minister Thulas Nxesi assembled a high-level meeting with top management of the South African construction industry "the big 7", to map out and expedite a way forward in the finalization of the gazette of the Construction Sector Code. This meeting resulted in a settlement agreement being signed between the South African government and the seven South African construction giants. This settlement agreement encompasses also elements in relation to small business development amongst others. The GEM (2014) report proposed that government should provide incentives for R&D. The aim was to foster innovation, and to attract and strengthen lasting linkages among domestic and foreign knowledge intensive firms.

This meeting was a consequence of a new trend highlighted in the October issue 2016 of the SA Construction, which revealed a decline in the financial performance (from year 2005 to date) in the South African construction industry on the statistics as audited by DeloitteCopperHouse 30 June 2016. It also recorded a long list of risk management challenges

currently prevailing throughout the South African construction industry. For the past decade, this country's economic growth has shown signs of being stagnant. This is witnessed by the rising cost of fuel, electricity and inflation fluctuation which stems directly from a volatile state of political affairs in South Africa.

To counterbalance and endure this decline, the South African construction industry will require construction companies at large to evaluate and critically analyze their risk management strategies. According to Siwangaza, *et al.,* (2014) small contractors must be prepared to withstand the risks posed by the current economic climate. Small contractors must align themselves with larger industry counterparts who ultimately sub-contracts smaller scope of work.

2.3.2. RISK DEFINED

2.3.2.1. DEFINITION OF RISK

Wang *et.al.,* (2004) defined risk as a multi-layered concept which is characterized by probabilities of harmful events occurring within a project, affecting its objectives. However, these occurrences are not necessarily associated with negative results but can also embody opportunities Baloyi and Price, (2003) and Hillson, (2011) outlined that risk and uncertainty are related. Hillson (2016), further elaborated that all risks are uncertain but not all uncertainties are risky, they(uncertainties) only cannot be measured. In 1921, Frank Knight defined clearly the difference between risk and uncertainty: *"Uncertainty is to be seen in a decidedly distinct way from the well-known concept of risk, from which it has never really been separated. (...) The main point is that in some cases the risk is a measurable magnitude, while in others it has a completely different nature; depending on the type to be dealt with, there are far-reaching and fundamental differences in the understanding of this phenomenon. (...) It seems that measurable uncertainty or the actual risk, which is a term we are going to use, is so different from the immeasurable uncertainty that in consequence does not constitute uncertainty".*

Hayes *et al.,* (1986) denoted risk and uncertainty as part of all construction work regardless of the size of the project which agrees with Smith *et al.,* (2006) who implied risk as an unforeseen event that can occur at any time during the constructing a project whether big or small. Risk according to ISO 31000-Guide 73, is described as the "effect of uncertainty on objectives". Mills, (2001) specified that risk can affect productivity, performance, quality and budget of a project.

Risk has numerous, but all acceptable definitions and these definitions have the same concept where risk is uncertainty of outcomes which can affect a project either negatively or positively depending on the how the organization maximizes on opportunities to optimize achievement of objectives Ahmeti and Vladi, (2017).

2.3.2.2. HISTORY OF RISK AND RISK MANAGEMENT

Some historians believe that the concept of risk arose through gaming. Some historical evidence attests that gaming gave rise to the probability theory, emanating from writings by Dante and Galileo. Furthermore, the mathematicians, Pascal and Fermat, wrote to each other about games of chance in the 1600s, a correspondence that is believed to have given rise to the modern probability theory. Even the *Code of Hammurabi* is a well-preserved Babylonian code of ancient Mesopotamia dating back to about 1754 BC. This information is documented in the book by Peter L. Bernstein: "Against the Gods": The remarkable story of risk.

As far back as the 1950's, numerous attempts to measure risk have been endeavoured. Risk management and its techniques are not a new concept. Okonkwo *et al.,* (2013) commented that risk analysis and reduction has long been practiced through safety, quality control and hazard education has been done in construction for a very long time. In our quest to understand this phenomenon, it will be better to start by defining what risk and its management is?

2.3.3. RISK MANAGEMENT DEFINED

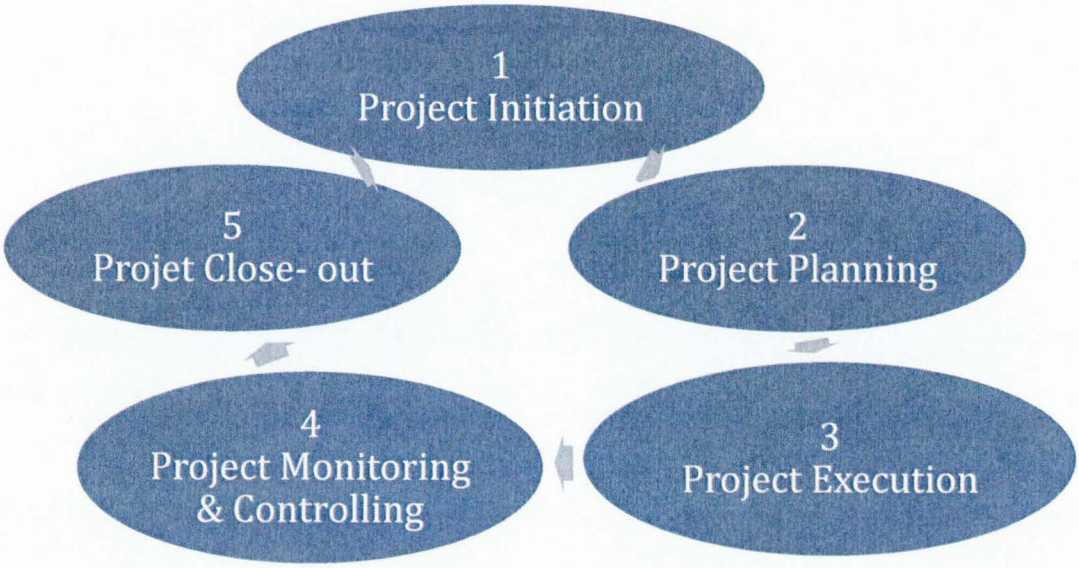
As with the definitions of risk above stated in section 2.3.2, there are equally various but acceptable definitions of Risk Management. Let's start by looking at our bible PMBOK, (2007) as the Body of knowledge and see how RM is defined:

PMBOK, (2007) defines Project Risk Management as the systematic process of identifying, analyzing, and responding to project risk. It includes maximizing the probability and consequences of adverse events to project objectives. ISO, (2018), defines RM as: a reference to coordinated set of activities and methods that is used to direct an organization and to control the many risks that can affect its ability to achieve objectives. ISO, (2009), further explains risk management as a guide which treats risk as a two-sided variability, advocating that risk management should not only be reduced to the impact of unfavorable events as a guide to help managers to identify upside opportunities.

Some of the better-known approaches to RM include other researchers such as Tar and Carr, (2001) claim that risk management help organization improve their resource allocation, leading to better capital efficiency and greater return on equity, whereas Edward and Bowen, (1998) defined risk management as *"a systematic approach to dealing with risk.* (ibid) further denoted that: *"a risk system (RM) should be established and appropriately context, set goals and objectives, identify and analyze risks, influence risk decision making and monitor and review risk response".*

2.3.3.1. PROJECT MANAGEMENT LIFE CYCLE

In a project life cycle, there are 5 stages as illustrated below in Figure 6. During the application of these 5 stages, integration of the ten project management knowledge areas is paramount. In fair practice, these ten knowledge areas are implanted within the 5 life cycle stages of a project of which RM is a feature of PM. Risk Management was added in 2013 as the 8th of the 10 knowledge areas PMBOK, (2013).



Sourced from PMBOK,2013

Figure 2.5 Project life cycle

The ten knowledge areas of project management are given below:

1. Project Integration Management
2. Project Scope Management
3. Project Time Management
4. Project Cost Management
5. Project Quality Management
6. Project Human Resources Management
7. Project Communications Management
8. **Project Risk Management**
9. Project Procurement Management
10. Project Stakeholder Management

2.3.3.2. INTEGRATION OF RM PROCESS TO THE PROJECT LIFE CYCLE

According to ISO 31000, a risk management process systematically applies management policies, procedures, and practices to a set of activities intended to establish the context, communicate and consult with stakeholders, and identify, analyse, evaluate, treat, monitor, record, report, and review risk. The RM as a knowledge area concentrates on identifying,

analysing, planning responses to both 'threat risks' (negative) and 'opportunity risks' (positive).

It is of the utmost importance that a risk management plan be put in place during the planning stage of the project. According to PMBOK, (2013) risk management should start during the planning stage of a project and be reviewed throughout the project life cycle. In Hayford and Ahmed, (2013)'s study each of these 5 phases of the project life cycle (as below illustrated) especially in phase 2 and 4, characteristics of risk and RM is mostly documented in the below mentioned manner.

1. Initiation Stage	2. Planning Stage	3. Execution Stage	4. Monitoring & Control Stage	5. Closing Out Stage
	Risk Management Plan		Monitoring & Risk Control	
	Risk Identification			
	Qualitative Risk Analysis	Updating of risk register	Updating of risk register	Updating & close-off of risk register
	Quantitative Risk Analysis			
	Risk Response Plan			

Adapted in Hayford and Ahmed, (2013)

Table 2.4 Graphical indication of RM integration to Project life cycle

2.3.3.3. RISK MANAGEMENT BENEFITS

Risk Management is probably the most difficult and mismanaged aspect in the ten PM knowledge areas of a project hence it is imperative to identify some of the generic benefits of risk management. Steyn, (2012) states that the definitive goal of RM is to improve project performance.

In a study conducted by Melbroek, (2002) and again a fair comparison by Frimpong, (2003) on benefits of risk management are advocated as follows:

- ✓ Saving resources, time, assets, income, property and personnel.

- ✓ Protection of an organization reputation and public image.
- ✓ Prevention and reduction of legal liabilities.
- ✓ Increasing stability of operations and promoting continuous improvement
- ✓ Protecting people and environment from harm.
- ✓ Improving the ability to prepare for unforeseen unexpected situations.

(ibid), on benefits of risk management supported as follows:

- ✓ Improves communication amongst stakeholders.
- ✓ Identifies and enhancement of monitoring of key factors within the built environment.
- ✓ Provides a better understanding of the threats to the project, its viability and strategies for strengthening the design.
- ✓ Identifies and allocation of risk to an individual most suited for.

Both Melbroek, (2002) and Frimpong, (2003) seem to be agreeing on the benefits of RM, although Hillson, (2011) and Hillson, (2016) goes in depth in his descriptions where he states that RM in projects is fundamental and paramount to manage the construction triple constraints effectively. The same is further concurred by Nawaz *et al.,* (2019) in their study conducted in Pakistan.

2.3.3.4. RISK MANAGEMENT IN SMME's

SMME's are a vital fragment to any country's economic state as they operate as the entry level pump of the unskilled and semi-skilled labour force Aigbavboa, *et al.,* (2016). Unlike their giant colleagues, small contractors are considered to be flexible and are assumed to adapt easily to change, as echoed by Lavia-Lopez and Hielb, (2014). SMME's are faced with the same challenges but on a smaller scale. Additionally, Burgstaller and Wagner, (2015) expands that small contractors profit less and have fewer access to a wide resource but are still expected to operate within the same construction environment with their giant counterparts. It is then imperative for SMME's to practice RM as their larger construction counterparts. In the bases of the prevalence of the deregulations and liberation of the trade industry, SMME's encounter more uncertainties as highlighted by Yeo and Lai, (2004) in their study. This view coerces SMME's owner-manager to consider integrating RM practices in their businesses in order to

keep abreast in the industry and remain viable & productive and to keep within a healthy profit margin as noted by Burgstaller and Wagner, (2015).

Risk management comprise of the following main steps: risk planning, risk identification, risk assessment(qualitative & quantitative), risk analysis, risk response, risk monitoring and review as recorded by Serpella, *et al.,* (2014); Nieto-Morote and Ruz-Villa,(2011) which differ slightly with PMI, (2008) extra activity of risk prioritization as documented by Baloyi and Price, (2003); ISO, (2009). Risk management is one of the 10 vital knowledge areas as propagated in Project Management Body of Knowledge PMBOK 5th Edition. These above-mentioned activities are detrimental to any business and should not be overlooked. Verbano and Venturini, (2013) underpinned that it is imperative to accurately identify the risk, assess the extent or impact it poses, provide measures to control the risk and pragmatically manage any residual risk.

Authors such as Hwang, *et al.,* (2013); Serpella, *et al.,* (2014; Zou, *et al.,* (2006) aptly, postulated in their studies that implementation of risk management is a significant component in construction projects. Serpela, *et al.,* (2014) further flagged that the RM integration into the day to day running of a project assists in accomplishing the project deliverables in terms of cost, quality, scope and time.

With the broader scholarly dialogues being documented on implementation of risk management, it can be hypothesized that RM implementation empowers an organization to contemplate the potential impacts of prevalent types of risks holistically with tangible benefits in project performance, profits, quality of work, time management and achievement of the project's objectives.

2.4. OBJECTIVES OF STUDY-LITERATURE REVIEW

2.4.1. TYPES OF PROJECT RISKS IN SMME's

Chihuri and Pretorius, (2010) stated that construction is a risky business. Identification and managing risks can be tricky, but not impossible when embed with cautious planning and execution as noted by Hillson, (2016) and Jones, (2017). Additionally, Hillson, (2016)

mentioned that unmanaged risks can derail a project and have serious impact on costs, schedules and performance of the project which can lead to delays and disputes. Jones, (2017) reinforced that effective identification and management of risks can lead to increased profits. Shahiq, *et al.,* (2015) stated that establishing good relationships with clients results in more projects able to expand their businesses into new markets and sectors. To identify and manage risks, it is vital to know the types of risks inherent on construction projects (Ibid). These types of risks can be financial, contractual, operational and environmental as noted by Shahiq, *et al.,* (2015) and can be caused by both internal and external factors, Zou, *et al.,* (2006). The same notion is concurred by various authors such as Al-sabah, Menassa e Hanna, Fortunato & Martins and on the study conducted by Dominguez and Paiva, (2018) concurs that risk should still be categorized either internal or external, as this classification is paramount to facilitate risk identification in RM processes.

Klemetti, (2006); Falkner and Heibl, (2015) categorised risks in different ways; some are classified based on the probabilities of occurrences while others are classified based on consequences of the impact, they may have on construction activities, their type and sources. Despite the various classifications, the objective is common where it is to assist in risk management and identification thereof Wong and Huie, (2006).

On the study conducted by Falkner and Heibl, (2015) on SMME's in Austria six risks are recorded to be prevalent amongst SMME's in no particular order: Interest rate risk, Raw materials risks, E-business and technological risks, Supply Chain Risks, Growth Risks and Management & Employees Risks. Contrary to this classification of risk by Falkner, (2015) authors such as Chopra and Meindl, (2013); Kim and Vonortas, (2014); Johnson and Flynn, (2015); Lysons and Farrington, (2016); has categorized risk into operational risk, market risk, financial risk and technical risk.

On the study conducted by Hayford and Ahmed, (2013) in Ghana the findings on prevalent risks are recorded as price fluctuations, inflation rates and delays in payment which is contrary to the study by Falker and Hiebl above-mentioned where "*price fluctuations, inflation rates and delays in payment* "are classified as falling under Interest rate risks. In a study conducted in South Africa by Shunmugan and Rwelamila, (2014) an addition of one more risk as prevalent to SMME's is recorded as: attaining of relevant approvals from the client thus

differentiating their findings from other researchers in the field. A similarity is derived from the findings by Sukumar, *et al.,* (2011) on their findings that in SMME's employee development is rarely offered and Kikwasi, (2011) stating that reluctance to practice RM by consultants is a difficulty where in projects consultants are responsible for providing mentorship to small contractors. On the study conducted by Zou, *et al.,* (2006) findings stipulating Socio-Political Risks as one of the risks SMME's are faced with although Banaitiene and Banaitis, (2012) highlighted that its impact is much more visible on large projects. Furthermore, to the risk types that are recorded within the knowledge area Shahiq, *et al.,* (2015) again echoed: Financial risk and Design risks in their study as prevalent risks.

For lucidity purposes in this research report an adoption to Falkner and Hiebl, (2015) risk classification is shadowed in the drafting of questionnaires for primary data collection and analysis in (Chapter 4). This approach was adopted to differentiate between the difficulties experienced by small contractors when implementing RM to the identification of a risk as a type. A further inclusion of other authors' findings on prevalent risks such as Shahiq, *et al.,* (2015); Zou, *et al.,* (2006); Mbachu and Nkando, (2007); Shunmugan and Rwelamila, (2014) was presented to respondents for analysis.

The researcher's review strategy was informed by study objectives which was to focus on identifying the frequently mentioned risks when discussing SMME's, as the point of departure on the literature review on risk types:

2.4.2. DIFFICULTIES AS INTERLINKED TO A RISK SOURCE IN RM IMPLEMENTATION

In reviewing the relevant literature, the following table is presented on difficulties identified in the implementation of RM amongst small contractors.

Author	Difficulties Identified
(Chihuri & Pretorious, 2010)	Lack of knowledge, lack of skills, complexities of analytic tools and techniques.
(Kikwasi, 2011)	Inadequate RM approaches, lack of knowledge, consultant's reluctance to practice RM.
(Chileshe & Kikwasi, 2013)	Low level of awareness, lack of experience, lack of information.

(Shunmugan & Rwelamila, 2013)	Lack of knowledge, lack of time, complexity of analytic tools.
(Hwang, et al., 2014)	Lack of time, lack of budget, low profit margins, Uneconomical character of RM implementation.
(Rostami, et al., 2015)	Lack of scaling knowledge, inadequate RM approaches, complexities of analytic tools and techniques.
(Fischer, 2015)	Lack of knowledge, lack of time, complexity of analytic tools.
(Ubani, et al., 2015)	Lack of RM awareness.
(Renault, et al., 2016)	Supply of faulty material, lack of communication, lack of funding, Working on dangerous areas and closure.
(Dominguez & Paiva, 2018)	Lack of material control, lack of knowledge.

Table 2.5 List of difficulties by different authors

Different authors have identified various difficulties towards RM implementation, depending on the nature of the project. On the study conducted by Mutezo, (2013) the difficulties identified for SMMEs were price fluctuations and inflation rates, this was mostly experienced when taking a loan which is usually the main source of finance available to SMME's. This was concurred by Bruns and Fletcher, (2008); Abdul- Rahman *et al.,* (2015) who then included in their findings an additional difficulty of competition amongst SMMEs which becomes a challenge when banks are reluctant to provide finance to companies with the least collateral. On the study conducted by Krishan *et al.,* (2014) denoted to the above -mentioned difficulties mentioned and falls under a **financial risks** umbrella. Hwang *et al.,* (2014); Shunmugan and Rwelamila, (2014) further elaborated and explained financial risk to comprise of factors leading to difficulties such as unmanaged growth, lack of sales, overtrading, problems with the economy, increase of crude oil and escalation of building supply price. Views on the current literature emphasized that small contractors often rely on external financing institutions to fund their endeavors which make them vulnerable to interests from the loans acquired.

The difficulties above mentioned can be argued to be interlinked with Growth risks of a company. If finance to execute a project cannot be easily secured by the company, then

growth is only an illusion. Marcelino-Sa'daba *et al.,* (2014) suggested that growth in SMME entities is accomplished through projects. The situation remains that SMME entities are run by the founding member/s as the Managing Director which then limits the number of employees employed on the project as noted by Chilese and Kikwasi, (2013).

On studies conducted by Rostami *et al.,* (2015) and Abdul-Rahman *et al.,* (2015), Raw materials sourcing is identified as difficulties to SMME's. Because of the rising competition within the industry SMME's are confronted with the volatile price commodity which then forces SMME's to look for ways to manage the rising cost of raw materials as recorded by Dominguez and Paiva, (2018). Larger construction companies have invested in technologies which make matters easy for them to change to cheaper resources or maximize on available specials. However, the view with small contractors is that they cannot afford these new technological investments and thus are exposed to raw material price risks as a difficulty. Dominguez and Paiva, (2018) concurred with the above researchers but referred to Raw material risks to be influenced by lack of proper project management. Furthermore, these raw material risks seem to be difficult for SMME's to manage looking on their inability to acquire the latest technologies. SMME projects have less profit margins and were noted by Hwang *et al.,* (2014) and Burgstaller and Wagner (2015) to have a fewer access to a wide resource base. Additionally, Sukumar *et al.,* (2011) stated that the above-mentioned difficulties amongst SMME's further exposes them to E-Business and Technological risks. These are online threats such as credit card fraud, e-mail abuse, cyber-attacks, identity theft etc.

Knowledge management risk is also mentioned by, Hayford and Ahmed (2013), where this risk relates to the human factor, workplace safety and risks inherent in executive teams. In line with this notion Gao *et al.,* (2013) demonstrated in his case study that RM is usually informally practiced by SMME's which then hinder effective skill transfer/knowledge dissemination to SMME employees. (Ibid) expanded in his study that because of a small number of employees employed by these entities, this exposes them to loss of knowledge and mismanagement of employees should one employee leave the company for better opportunities elsewhere.

On the study conducted by Aloini *et al.,* (2012), Supply Chain risks is identified as a difficulty to SMME's, while Renault *et al.,* (2016) supplementary reported that small contractors are usually tied to one supplier which makes them exposed to production interruptions, should

the one supplier fail to deliver material on site. Hwang *et al.,* (2014) supported that this risk usually has consequences such as uncertain productivity of resources, industrial relations problems, and communication problem on deliverables.

It can then be argued that when discussing types of risks and difficulties towards their management, literature seem to interlink the risk type or risk source to a difficulty experienced towards its management in the same classification due to the influence it poses.

2.4.3. RISK MANAGEMENT PROCESSES BY SMME's

A survey of available literature revealed that RM processes can be generally summarized into 6 steps as follows:



Figure 2.6 Risk Management Process

Adapted from (Shunmugam & Rwelamila, 2014)

Fewings, (2013) and Hayford and Ahmed, (2013) echoed the same that projects are different in nature, size and complexity thus will experience various risks Fewings, (2013). According to Bridges, (2016) RM in a project will involve the same process, no matter the size of an organization or project. Shunmugan and Rwelamila (2014) agreed with Chihuri and Pretorius (2010) that, in a fair RM practice formation of a risk management plan is mandatory where a risk is identified, captured in the risk register and management to an acceptable probability thereof.

1. **Risk Management Planning:**

   Bridges, (2016) stated that RMP is "deciding how to approach and plan the RM activities for the project". PMBOK, (2013) underpinned that:

- The project Manager, project team, all stakeholders including the relevant expects reviews procedures and templates that exist for risk management, therefore determining how risk management is handled on the project and develop the risk management plan. Chihuri and Pretorius (2010) although in their study they concentrated on large and complex projects but underpinned that an RM plan is made to adapt and adjust to the size, complexity, experience, skill level, etc. of the project.
- The output of the RM Planning is the RM plan which defines how the risk process will be structured and performed during the project life cycle.
- A risk management plan includes the following as adapted in the PMBOK, (2013):
    - ✓ Methodology,
    - ✓ Roles and responsibilities of all stakeholders,
    - ✓ Budget for the RM processes,
    - ✓ Turn-around times-of how often the risk process will be performed throughout the project,
    - ✓ Scoring and interpretation,
    - ✓ Threshold,
    - ✓ Reporting formats
    - ✓ Tracking,

2. **Risk Identification:**

Marcelino-Sa'daba *et al.,* (2014) stipulated that risk identification is an important process towards SMME's RM implementation. According to Nieto-Morote and Ruz-Vila (2011) this process is the "determining of which risks might affect or impede the project and the documentation of their characteristics, thereof" usually by using a DELPHI, SWOT analysis, Scenario planning, Historical data, Brainstorming, CPM, S-Curve or putting in place of an RMP etc. Authors such as Hayford and Ahmed 2013; Smit, 2012 records identification of risk the following:

- Identifying of risk is a creative process including brainstorming sessions where the entire professional team is requested to create a list of potential risk and evaluating the likelihood and impacts on the project.

- The major risk identification efforts occur during initiation and planning phase but should not stop there but risk identification should run throughout the project cycle.
- Risk Identification is not complete until a WBS is created for developing of a RBS, this framework is also utilized by David Hillson-the Risk Doctor himself.
- Identifying the sources of risk by category is another method of exploring potential risk on the project. There are different ways of categorizing risk depending on the size and nature of the project. According to Smit, (2012) the construction industry regards the following risk categories (in no particular order): Financial risk, Technical risk, Time risk, Operational risk, Environmental risk and Political risk.

Various academic authors have classified risk differently such as (Valsamakis *et al.,* 1996; Mills, 2001; Anderson and Terp, 2006; Smit, 2012; Toroun, 2012; Falkner and Heilb, 2015; and IRMSA, 2018):

- **Approach One:**
  - ✓ Physical, Social, Political, Operational, Economical, Legal and Cognitive.
- **Approach Two:**
  - ✓ Systematic risk, otherwise market risk independent of entity control, This is pure risk (insurable) only a risk of loss e.g. fire. theft, personal injury.
  - ✓ Specific risk relating to specific projects, along with all variants, This is business risk either a gain or a loss.
- **Approach Three:**
  - ✓ Marketing, Financial, Environmental, Property and personnel or resource management risk.
- **Approach Four:**
  - ✓ Strategic risk, Value-based risk, Information based risk, People based risk, Environmental risk, Compliance risk and Asset risk.
- **Approach Five**:
  - ✓ Financial risk, Business risk, Compliance risks, Operational risk and others.
- **Approach Six**:
  - ✓ Interest rate risk, Raw materials risks, E-business and technological risks, Supply Chain Risks, Growth Risks and Management & Employees Risks.

3. **Qualitative Risk Analysis:**

   Shunmugan and Rwelamila (2014) & Hopkins (2010) defined Quality Risk Analysis as: "performing a qualitative analysis of risk and conditions to prioritize their effects on project objectives".

   - ✓ This type of analysis uses intuition experience and judgement.

4. **Quantitative Risk Analysis:**

   Hopkins, (2010) and Taroun, (2012) further defined Quantitative Risk Analysis as: "measuring the probability and consequences of risks and estimating their implications for project's objectives".

   - ✓ This type of analysis uses proven mathematical models such as the Monte Carlo simulation, the Fuzzy Sets Theory, the Analytic Hierarchy Process or the Probability-Impact Risk Model.

TECHNIQUES USED IN RISK ANALYSIS	
QUALITATIVE (looks at a range of values like low, medium, high)	**QUANTITATIVE** (puts monetary value to a risk)
• **Risk Probability & Impact Assessment.** • **Probability & Impact Matrix.** • **Risk Data Quality Assessment.** • **Risk Categorization.** • **Risk Urgency Assessment.** • **Expert Judgement.**	• Data gathering & representative techniques. • Expert Judgement. • Quantitative Risk Analysis & Modelling. ▪ Sensitivity Analysis. ▪ Expected Monetary Value (EMV) Analysis. ▪ Decision Tree Analysis. ▪ Tornado Diagram. ▪ Monte Carlo Analysis.

Sourced from (Hopkins, 2010)

Table 2.6 Risk analysis techniques

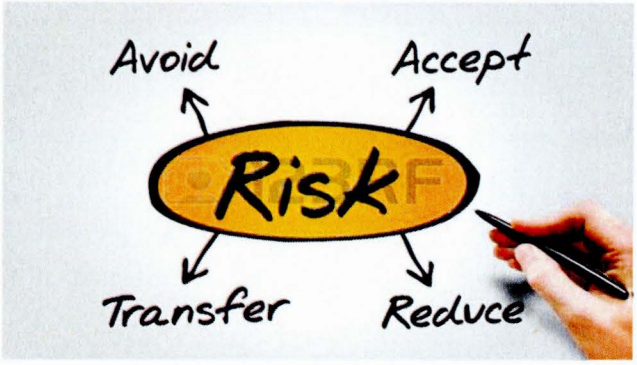
5. **Risk Response Planning:** developing procedures and techniques to enhance opportunities and reduce threats to the project's objectives where a mitigation strategy is put in place to address the items with that have the highest ratings on both factors (likelihood and impact). According to Aloini *et al.,* (2012) recording of risk response action is vital of whether the Action Trigger is pulled or not;

   - ✓ Risk Retention-This risk reduction method is when a decision to acknowledge and manage a risk is taken on the project.

- ✓ Risk Reduction- This is the investment of funds to reduce the risk on the project e.g. purchasing of a guarantee against a specific currency rate.
- ✓ Risk Transfer-This risk reduction method is when a shift of risk is done from one project to another party such as an insurance policy against an event anticipated as noted by Schatterman *et al.,* (2008).

But on other studies, the risk retention approach according to Sankara *et al.,* (2017) is divided into;

- ✓ Risk Avoidance -This usually involves developing an alternative strategy that has a higher probability of success, but it is usually costly for the project.
- ✓ Risk Sharing-This usually involves partnering with other stakeholders and share the responsibilities for the risk activities e.g. joint ventures.



Sourced from (Hillson, 2011)

Figure 2.7 Hillson's Risk retention approach

6. **Risk Monitoring and Control:** monitoring residual risks, identifying new risks, executing risk reduction plans, and evaluating their effectiveness throughout the project life cycle.

Therefore, RM processes are cyclical according to Toroun, (2012), until the project draws to project closeout phase. Chihuri and Pretorius, (2010) derived in their study that all the above steps are to be transferred onto a standardized framework such as a Risk Register and are revisited and communicated to stakeholders periodically until project close-off.

2.5. RESEARCH GAP IDENTIFIED

From the theoretical literature review that have been elaborated above, it can be argued that various studies have been conducted on implementation of risk management in the South African construction industry and globally, but a limited number of literatures can be found on the types or sources of project risks that are prevalent to small contractors in SA. The need arose to scrutinize literature and gain a wider understanding on the topic. This study seeks to bridge the gap where an oversight has been identified in the key difficulties facing the small contractors in the South African construction industry which can be addressed by the effective implementation of risk management.

2.6. CONCLUSION

Comprehensive literature was conducted and presented in this chapter. Insights from various accredited peer reviewed was included and critically analyzed with the view of identifying similarities and contradictions made by previous researchers. The next chapter 3 focuses on the methodology applied in this research report.

CHAPTER 3: RESEARCH METHODOLOGY

3.1. INTRODUCTION

Kothari, (2003) stated that research methodology refers to a systematic way applied to solve the research problem. This chapter covers the research philosophy, research strategy, survey population, sampling design and procedure, method of data collection data processing analysis.

The key feature of the deductive approach as stated by Saunders *et al.*, (2016) is that it explores, reviews literature and compare it with primary data. Therefore, the starting point for this study will be to review literature.

Figure 3.1 Flow diagram showing linkages between elements:



3.2. RESEARCH PHILOSOPHY- (epistemology)

The research philosophy undertaken in this study is pragmatist and epistemology where the study focuses on improving practice by including assumptions of human knowledge, what constitutes acceptability, valid and legitimate knowledge according to Saunders *et al.*, (2016). A generalization deductive approach was adopted in this study. According to (Ibid) where a research starts with theory, often developed from the reading of the academic literature. The mixed method approach was adopted and used to answer questions about the complex nature of the phenomena, often with the purpose of describing and understanding the phenomena from the respondent's point of view Kothari, (2013). According to Seku *et al.*, (2015), two methods can be adopted in a single study which informed the decision by the researcher to use a mixed method approach on this study. The mixed method approach was adopted to

enhance theory development, allow the research content to be better understood, permit a case specific variable to be better identified and encourage the research process to produce analytical outcomes to a greater extent than it might have been the case with a mono-method approach as stated by Molina-Azorin, (2012). The secondary data to develop a theory was sourced from 4 journals. The primary data collected from the survey was interpreted both qualitatively and quantitatively.

3.3. RESEARCH STRATEGY- (Survey by questionnaires)

3.3.1. DATA COLLECTION METHOD AND TOOL

The research methodology for the study provided both primary and secondary data. The primary data collected formed the investigation using semi-structured questionnaires.

Kothari, (2003) states that primary data are the data which are collected for the first time, hence they must be original in character, while secondary data are the data which have already been collected by someone else and have already been passed through the statistical process.

The study focused on small construction projects in South Africa, the data was gathered within a group of small contractors registered in the database sourced from the Gauteng Department of Human Settlement by first conducting a pilot survey making use of a semi-structured questionnaire. This questionnaire was sent to 2 prominent small contractors within the database. According to Gill and Johnson, (1991) piloting a survey this way was essential to project how respondents will interpret and infer the questions. The pilot respondents were requested to scrutinize and appraise the questionnaire by trying to answer questions and suggest where necessary. Their inputs were used to outline the final structure of the questionnaire.

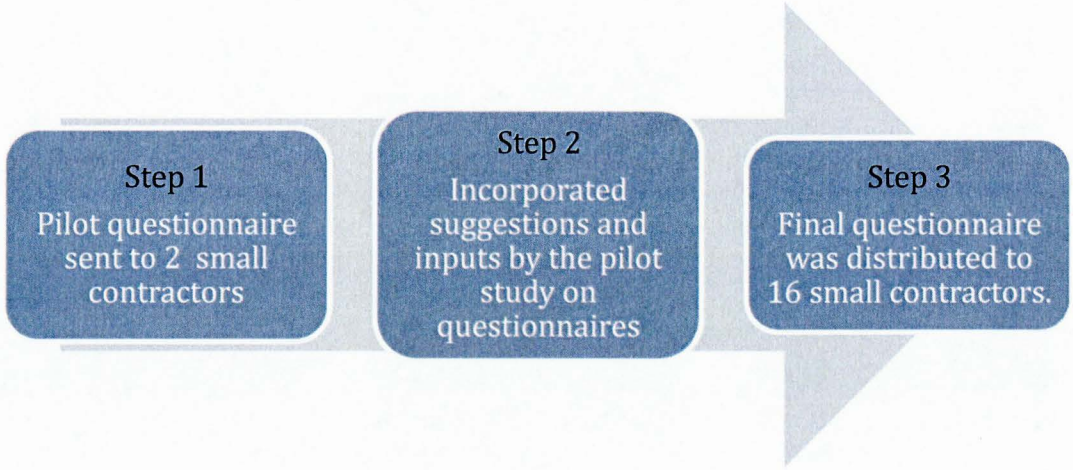
Questionnaires were first distributed by email on the 1st June 2018 to a list of small contractors sourced on the Gauteng Department of Human Settlement database, CIDB

registered as grade 1-5 GB or CE. Weekly reminders were sent via e-mail and telephonically to ensure an acceptable response rate. The response rate on this tool proved to be ineffective as the response rate was very poor. Out of 30 questionnaires that were sent, only one contractor responded by cut-off date 31st July 2018. The data collection strategy was changed.

A meeting scheduled by GDHS on a quarterly basis was targeted by the researcher to reach the same targeted group during their quarterly progress reviews with GDHS. Questionnaires were distributed during the meeting and were collected at the end of the same meeting dated the 20th August 2018. Nineteen questionnaires were distributed, and eighteen questionnaires were received back. This response rate proved to be effective as it presented a 95%.

Another consideration for choosing this data collection strategy was due to the limited timeframe to complete the research report. This coupled with limited financial resources, informed the decision to make use of at first an electronic semi-structured cross-sectional survey (snap shorts) to collect data which proved ineffective. It further informed a change of strategy to reach the same targeted population. This enabled the study to reach the targeted population while not incurring excessive cost.

Figure 3.2 Formulation of questionnaire flow diagram



3.4. SAMPLING DESIGN

According to Saunders *et al.,* (2016) sampling intention is made of two elements which is Sampling method and Estimate method. Sampling method refers to the rules and procedures by which some elements of the population are included in the sample. Some common sampling methods are simple random sampling, stratified random sampling, and cluster sampling. The study used a stratified sampling method. This technique was selected because of the various categories of contractors as underpinned by Dudovskiy, (2014). This method assured a better representation of the population. An additional benefit of simple stratified random sampling is that it allowed the researcher to use statistical methods to analyse sample results which are representative of each category since the research was targeted on small contractors with a CIDB grading Grade 1-5 GB and CE but utilising the GDHS incubator program database. The study targeted respondent's business owners with at least 80% control and share of business.

The information represented in **Table 3.1** indicated the number of contractors that were available to be used as a population for this study.

Coded Respondents	**Number of Questionnaires distributed**	**Sampling Design**	**Data Collection Tool (Semi-Structured)**
001	1	Simple stratified random	Questionnaire
002	1	Simple stratified random	Questionnaire
003	1	Simple stratified random	Questionnaire
004	1	Simple stratified random	Questionnaire
005	1	Simple stratified random	Questionnaire
006	1	Simple stratified random	Questionnaire
007	1	Simple stratified random	Questionnaire
008	1	Simple stratified random	Questionnaire
009	1	Simple stratified random	Questionnaire
010	1	Simple stratified random	Questionnaire

011	1	Simple stratified random	Questionnaire
012	1	Simple stratified random	Questionnaire
013	1	Simple stratified random	Questionnaire
014	1	Simple stratified random	Questionnaire
015	1	Simple stratified random	Questionnaire
016	1	Simple stratified random	Questionnaire
017	1	Simple stratified random	Questionnaire
018	1	Simple stratified random	Questionnaire
Total	**18**		

3.5. RELIABILITY

Reliability is the degree to which an assessment tool produces stable and consistent results. In this study, the list of participants was drawn from the GDHS incubator program database of small contractors that had been in operation in the last 5 years (2014-2018 fiscal years).

The study ensured reliability through total transparency, systematic approach to data collection from study sources. Also, by documenting clearly the flow and processing of the data depicting a clear map that whoever may wish to test its principles could get the exact same answer as the researcher.

3.6. VALIDITY

In this study the questions concerning validity were associated with how valid the researcher's data collection and analysis were. The study used research methods that ensured that data recording was accurate, and the interpretations of data was empirical and logical as it was important to increase reliability and validity in mixed method studies. Basically, validity boils down to whether the researcher was really measuring what the study claimed to be measuring.

3.7. DATA ANALYSIS

Analysis and descriptions were made from the data collected from the respondent involved in the research study. Microsoft Word and Excel programs were utilized to present the graphics as tables, figures and graphs. Data was scrutinized based on the frequency of occurrence and then divided by the total number of respondents involved and presented as a percentage of probabilities.

The formula utilized is as follows:

$$\boldsymbol{x = f \div n \text{ x } 100} \text{ (Wordpress, 2019)}$$

Where: x presented the % of probability

f presented frequency of occurrence

and

n presented the total number of respondents involved

Saunders *et al.,* (2016) stated that a frequency distribution approach using tables is the simplest way of summarizing data for individual variables so that specific amount can be read and for categorical data, the table summarizes the number of cases (frequency) in each category. (Ibid) further noted that tables attach no visual significance to highest and lowest data values unless emphasized by alternative fonts. In this study graphs were used to provide visual clues. The analysis approach in this research report was hence adopted on the bases of the above-mentioned motivations.

3.8. CONCLUSION

Research methodology was discussed in this chapter. The next chapter (4) focuses on the statement of findings and analysis of the primary data.

CHAPTER 4: STATEMENT OF FINDINGS AND ANALYSIS OF DATA

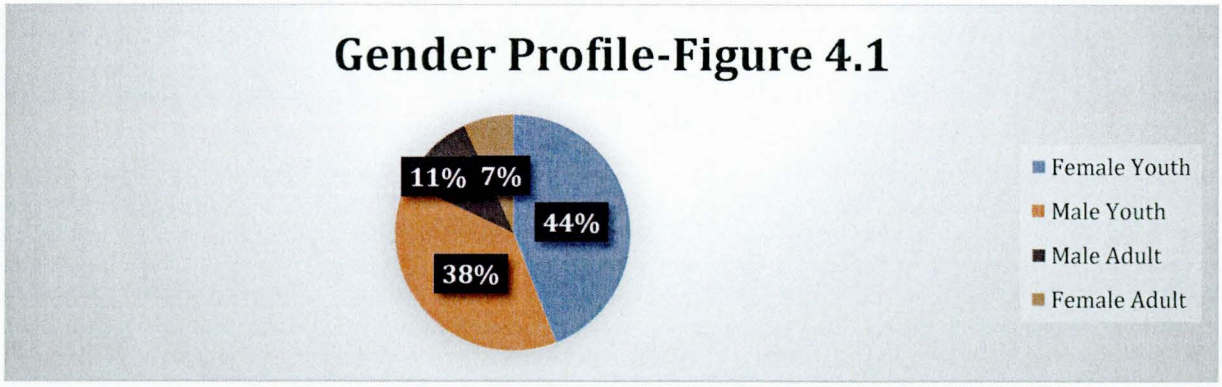
4. INTRODUCTION

This chapter focuses on the analysis of data collected for both qualitative and quantitative method including the statement of findings. Section A-C findings is of data that will be analysed quantitatively, and Section D findings is of data that will be analysed qualitatively.

4.1. SECTION A - ANALYSIS OF GENERAL AND COMPANY INFORMATION

4.1.1. GENDER PROFILE - Table 4.1

GENDER AND AGE	FREQUENCY	PERCENTAGE %
Youth Male (38 yrs. & less)	07	38%
Youth Female (38 yrs. & less)	08	44%
Adult Male (39 yrs. & over)	02	11%
Adult Female (39 yrs. & over)	01	7%
Total	**18**	**100%**



The study indicated that 44% of the respondents represented the youth female within the sample followed by 38% representing the youth males, then 11% representing the adult male and the lowest was 7% indication of the adult female of the sample.

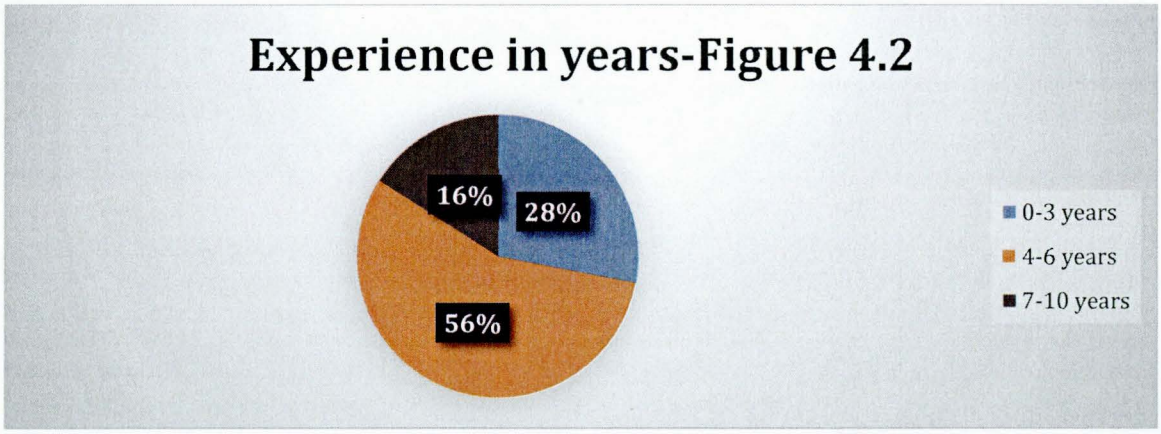
4.1.2. POSITION OF EMPLOYEE WITHIN THE ORGANIZATION - Table 4.2

NUMBER OF EMPLOYEES	FREQUENCY	PERCENTAGE %
Founder or Managing Director	18	100%
All Other Positions	00	0%
Total	**18**	**100%**

All 18 respondents indicated that they hold a 100% of the company's equity or were the founding member of the company representing a 100% response rate.

4.1.3. YEARS OF EXPERIENCE - Table 4.3

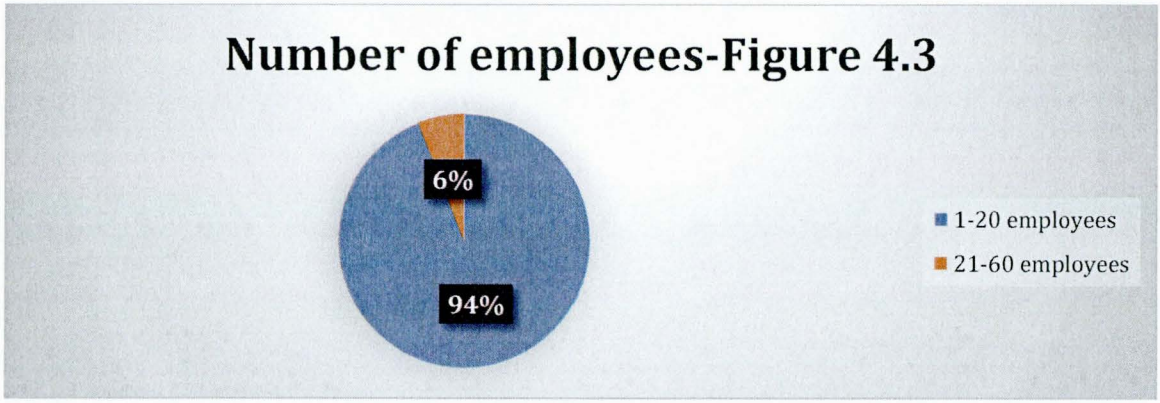
CATERGORY	FREQUENCY	PERCENTAGE %
0-3 years	05	28%
4-6 years	10	56%
7-10 years	03	16%
More than 10 years	00	0%
Total	**18**	**100%**



Out of eighteen responses, 56% of respondents had 4-6 years of experience, followed by those with 0-3 years' experience indicating a 28% response and lastly a 16% response on respondents with 7-10 years' experience.

4.1.4. NUMBER OF EMPLOYEES WITHIN THE ORGANIZATION – Table 4.4.

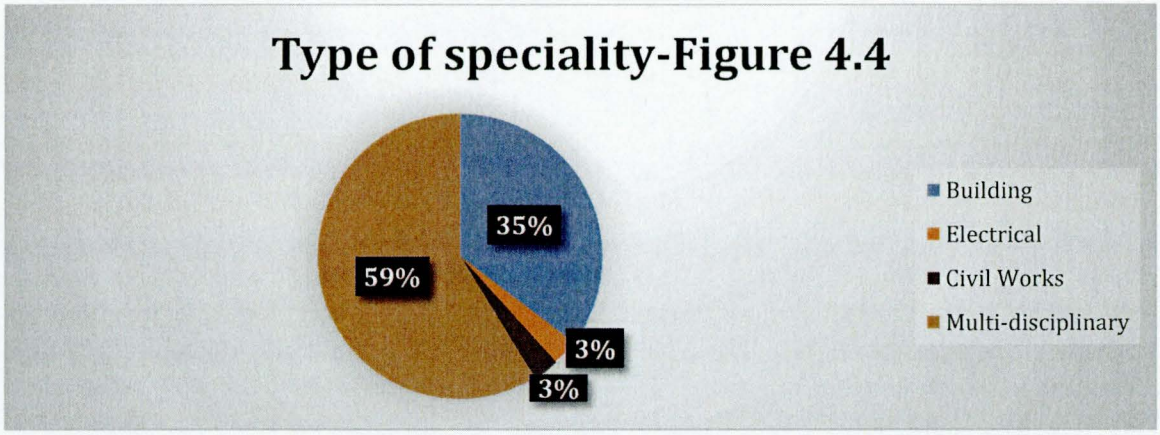
NUMBER OF EMPLOYEES	FREQUENCY	PERCENTAGE %
1-20	17	94%
21-60	01	6%
61-250	00	0%
250+	00	0%
Total	18	100%



Out of eighteen responses, 94% of small contractor's representative employed between 1-20 employees within the organization and only 6% employed between 21-60 employees as indicated on the table above.

4.1.5. TYPE OF ORGANIZATIONAL SPECIALITY – Table 4.5.

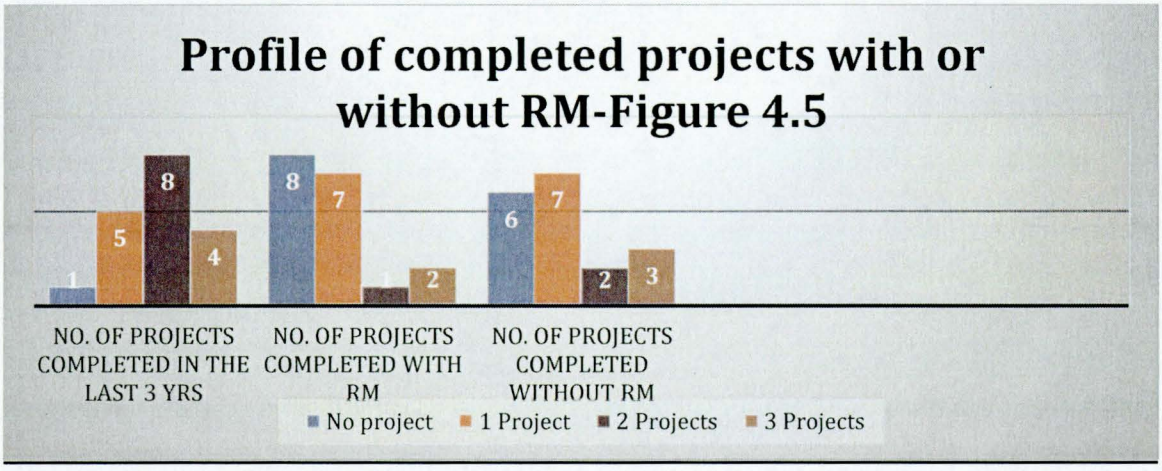
CATERGORY	FREQUENCY	PERCENTAGE %
Building	13	72%
Mechanical	00	0%
Electrical	01	6%
Civil Works	01	6%
Multi-disciplinary	03	16%
Total	**18**	**100%**



Most of the respondents specializes in Building projects at (72%) of the sample, followed by respondents specializing in Multi-disciplinary fortes at (16%) and lastly was Electrical and Civil Works both at (3%) each.

4.1.6. AWARENESS OF RM AS A KNOWLEDGE AREA - Table 4.6

QUESTIONS POSED TO THE RESPONDENTS
Q1. Projects completed in the past 3 years?
Q2. Number of projects completed with RM in place?
Q3. Number of projects completed without RM in place?
Q4. Duration of projects completed without RM in place?
Q5. Duration of projects completed with RM in place?



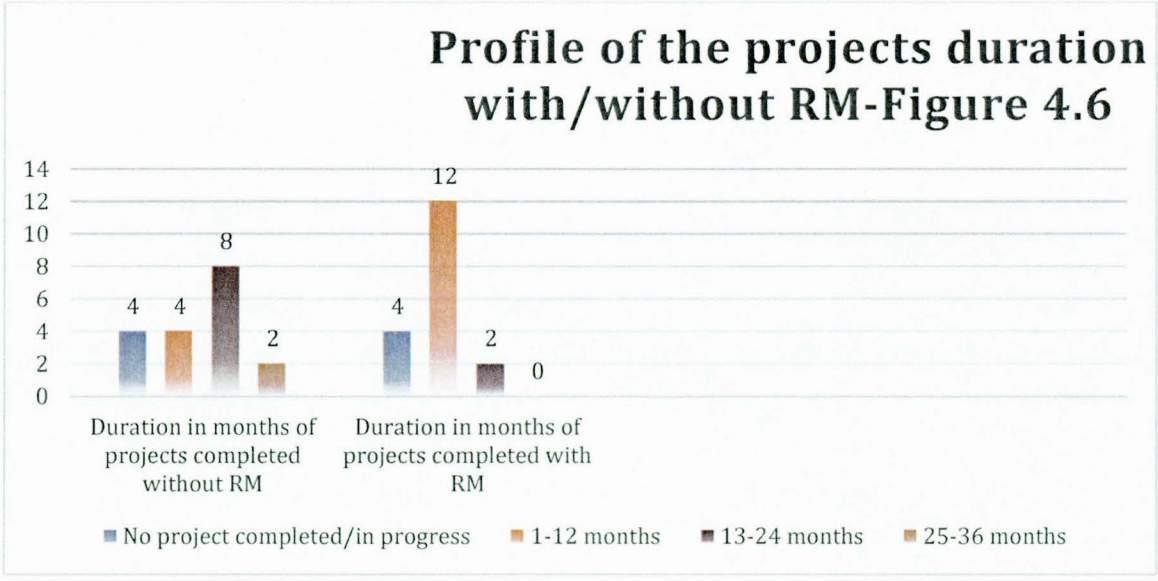
Out of eighteen profiled respondents, the study revealed that 8 out of 18 had a minimum of 2 projects that they had completed in past 3 years, followed by 5 out of 18 respondents having a single project completed in the past 3 years, followed by 4 out of 18 respondents had 3 projects completed in the last 3 years and lastly 1 out of 18 respondents had no projects competed in the past 3 years and were only basing their responses on the current first project under construction.

The study profiled eighteen respondents, and it revealed the following:

- Eight out of eighteen respondents had no projects completed in past 3 years that had RM in place in the past 3 years.
- Seven out of eighteen respondents had 1 project completed in past 3 years that had RM in place in the past 3 years.
- Two out of eighteen respondents had 3 projects completed in past 3 years that had RM in place in the past 3 years.
- One out of eighteen respondents had 2 projects completed in past 3 years that had RM in place in the past 3 years.

The study profiled eighteen respondents, and it revealed the following:

- Seven out of eighteen respondents had 1 project completed in past 3 years that had no RM in place in the past 3 years.
- Six out of eighteen respondents had no projects completed in past 3 years that had no RM in place in the past 3 years.
- Three out of eighteen respondents had 3 projects completed in past 3 years that had no RM in place in the past 3 years.
- Two out of eighteen respondents had 2 projects completed in past 3 years that had no RM in place in the past 3 years.



When profiling on the duration the projects took to be completed, the following were the outcome.

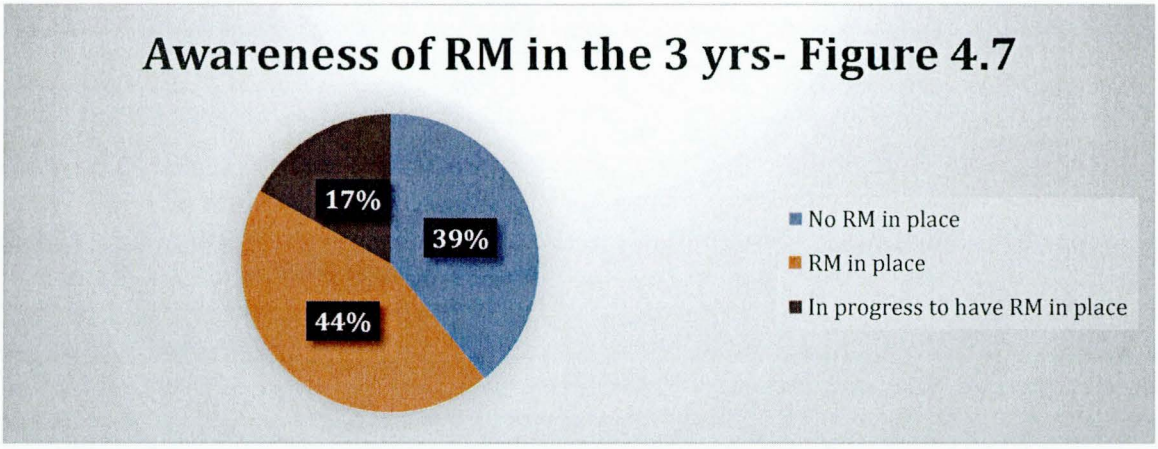
- Eight respondents out of eighteen completed their 6 months duration project in 13-24 months where there was no RM in place.
- Four respondents out of eighteen completed their 6 months duration project in 1-12 months where there was no RM in place.
- Four respondents out of eighteen completed their 6 months duration project either did not have any projects completed or the current project was still in progress where there was no RM in place.
- Two respondents out of eighteen completed their 6 months duration project in 25-36 months where there was no RM in place.

When profiling on the duration the projects took to be completed, the following were the outcome (with and without RM respectively).

- Twelve respondents out of eighteen completed their 6 months duration project in 1-12 months where there was RM in place.
- Four respondents out of eighteen completed their 6 months duration project either did not have any projects completed or the current project was still in progress where there was RM in place.
- Two respondents out of eighteen completed their 6 months duration project in 13-24 months where there was RM in place.

4.1.7. AWARENESS OF RM IN THE LAST 3 YEARS - Table 4.7.

CATERGORY	FREQUENCY	PERCENTAGE %
No RM in place	07	39%
RM in place	08	44%
In progress to have RM in place	03	17%
Total	**18**	**100%**



Forty-four percent of the respondents had implemented RM in their projects in the last 3 years in business, thirty-three percent of the respondents had no RM implementation in their projects, whereas seventeen percent of the respondents were still in the process of acquiring the RM expertise on their projects in the last 3 years in business.

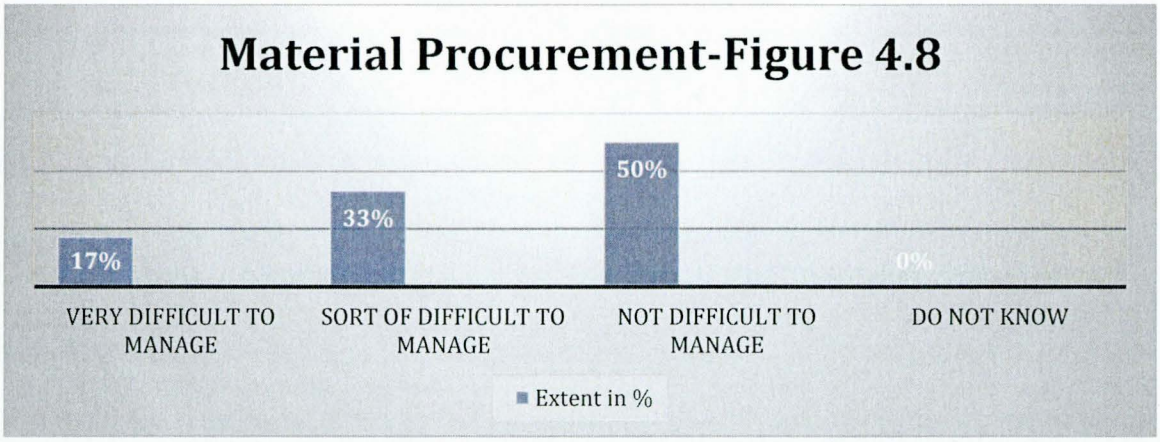
4.2. SECTION B

TYPES OF PROJECT RISKS

Outcomes from the profiling on the extent of the difficulties experienced by small contractors in the management of each risk associated with SMME's implementation of risk management.

4.2.0. EXTENT OF DIFFICULTY IN MANAGEMENT OF EACH RISK TYPE

4.2.1. MATERIAL PROCUREMENT RISK



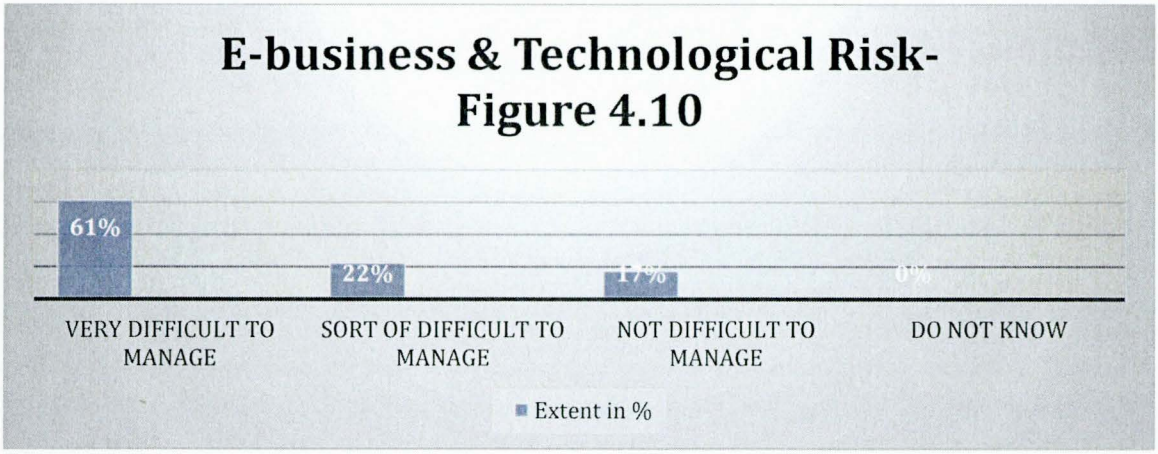
Fifty percent of the respondents did not find it difficult to manage material procurement in their project, thirty-three percent of the respondents felt that it was sort of difficult to manage material procurement in their project, whereas seventeen percent found it to be very difficult to manage material procurement on their project.

4.2.2. INTEREST RATE RISK



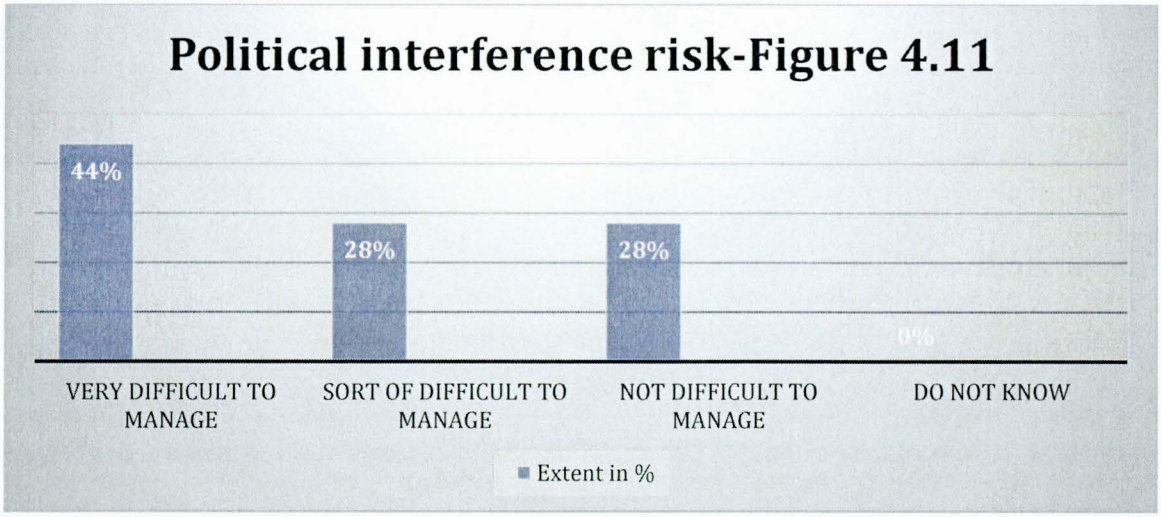
Sixty-seven percent of the respondents viewed interest rate risk as a posing difficulty when executing their projects, whereas only thirty-three percent seemed to think interest rate was a risk on their project and very difficult to manage.

4.2.3. E-BUSINESS & TECHNOLOGY RISK



Sixty-one percent of respondents, when asked to rate the extent of difficulty when managing E-business and technological risk scored the highest, followed by twenty-two percent of respondents recording to think it is sort of difficult to manage E-business and technological risk in their running of the business and lastly, seventeen percent of the respondents believed it is not difficult to manage E-business and technological risk in the execution of the projects.

4.2.4. POLITICAL INTERFERENCE RISK



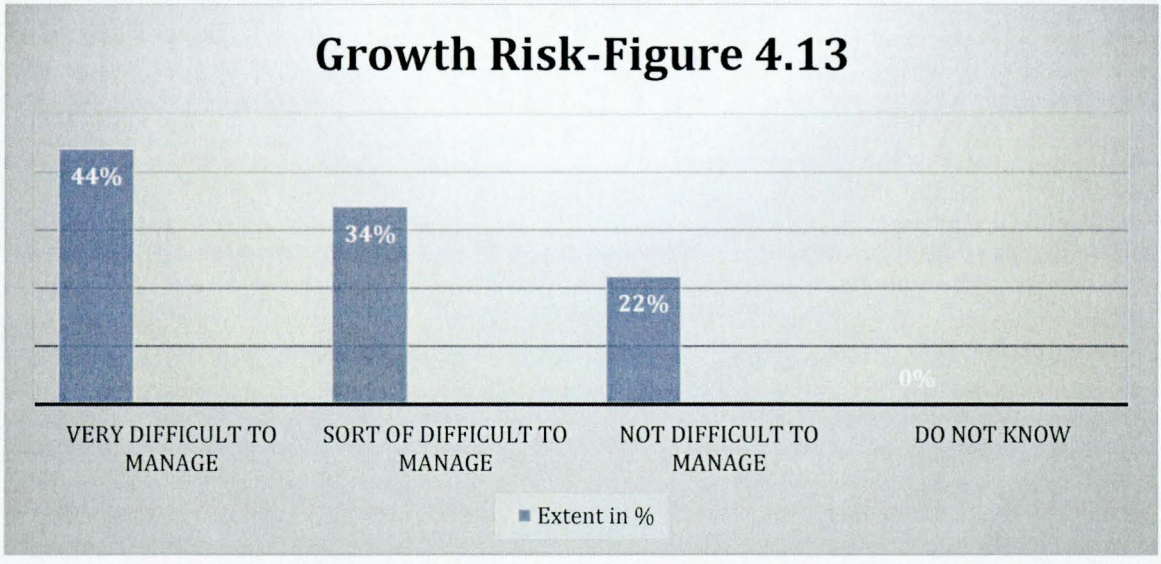
Forty-four percent of respondents believed that political interference on their projects was very difficult to manage, whereas twenty-eight percent believed political interference to be sort of difficult and scouring the same twenty-eight percent of respondents saying, it is not difficult to manage political interference on their projects.

4.2.5. MANAGEMENT OF EMPLOYEES RISK



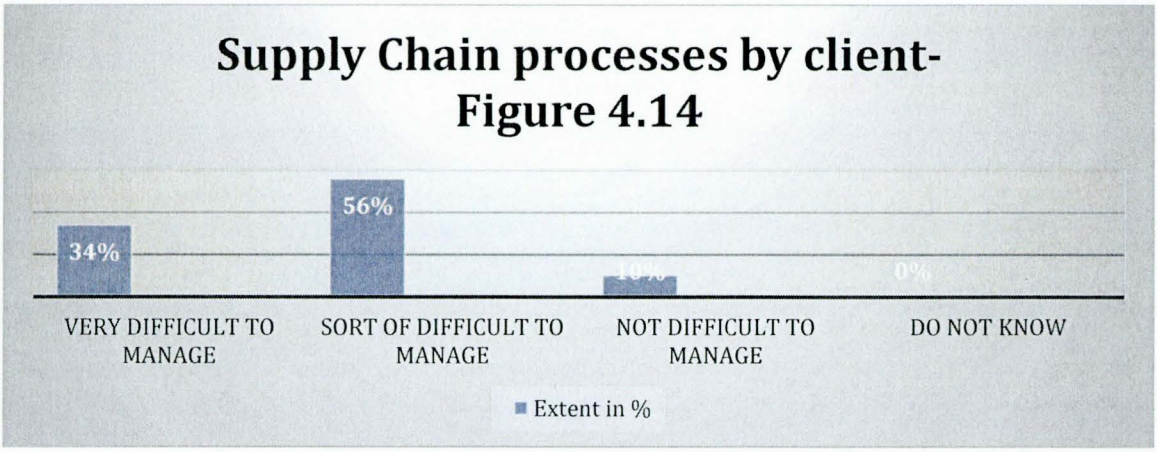
Forty-four percent of respondents believed it is very difficult to manage employees on their projects and thirty-four percent of respondents said they do not find it as a risk to manage employees, with a further twenty-two percent of the respondents saying it is sort of difficult to manage employees in their projects.

4.2.6. GROWTH RISK



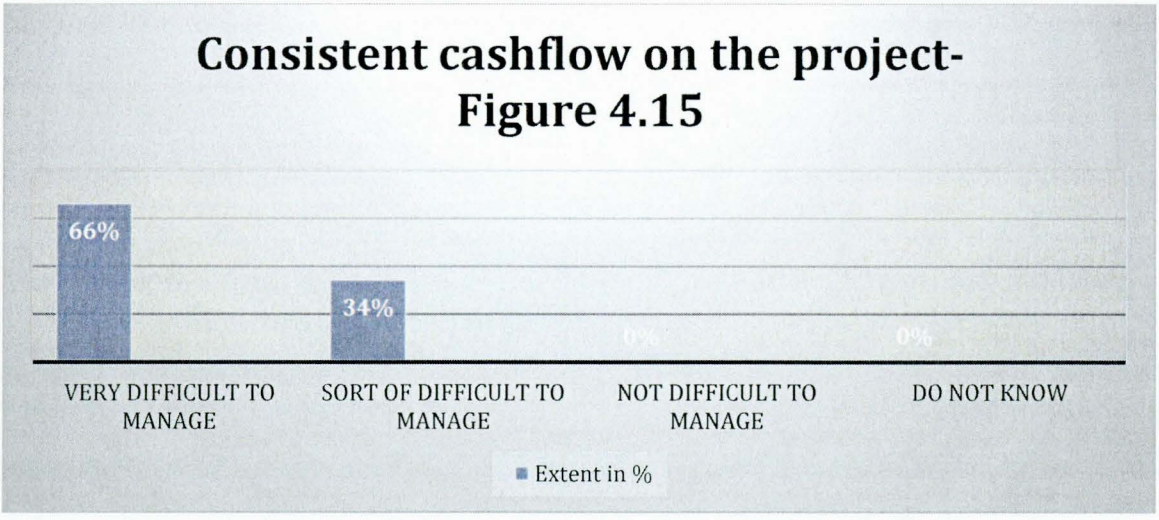
Forty-four percent of respondents believed it is very difficult to manage growth risk on their projects and thirty-four percent of respondents said they find it sort of difficult to manage growth of business, with a further twenty-two percent of the respondents saying it is not difficult to manage growth risk in their projects.

4.2.7. SUPPLY CHAIN RISK



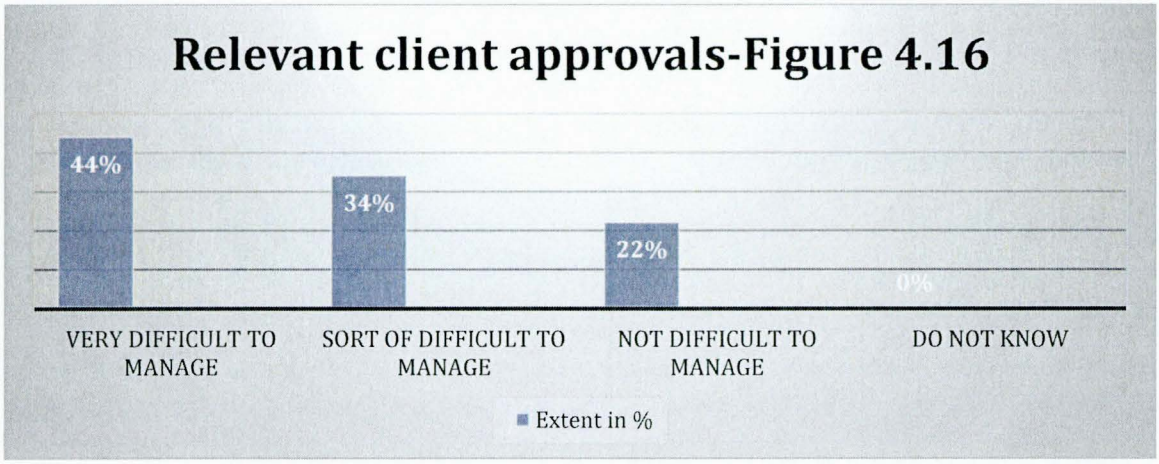
Fifty-six percent of the respondents found it sort of difficult to manage supply chain processes by the client and thirty-four percent of the respondents said it a risk and very difficult to manage supply chain processes by the clients on their projects, whereas ten percent said it is not difficult to manage client supply chain processes on their projects.

4.2.8. CONSISTENT CASHFLOW ON THE PROJECT



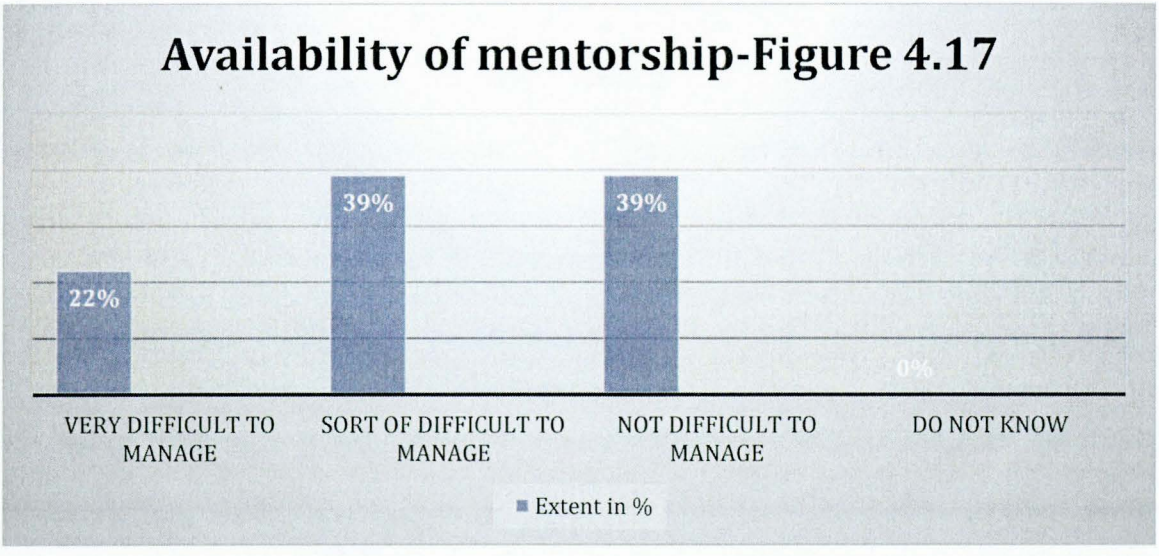
Sixty-six percent of the respondents found it very difficult to have a consistent cashflow on the project, on the other hand thirty-four percent of respondents said they believe it is sort of difficult to have a consistent cashflow on the project.

4.2.9. RELEVANT CLIENT APPROVALS



Forty-four percent of respondents believed that obtaining relevant approvals from the client was very difficult to manage, thirty-four percent said they find the same to be sort of difficult to manage and lastly twenty-two percent of the respondents found it not at all difficult to obtain relevant approvals from the client on their projects.

4.2.10. AVAILABILITY OF MENTORSHIP RISK



Thirty-nine percent of respondents indicated that it was sort of difficult to find mentorship on their projects and the same thirty-nine percent was recorded on respondents saying it was

not difficult to obtain mentorship on their projects, whereas twenty-two percent said it was very difficult to obtain mentorship on their projects.

4.3. RISK MANAGEMENT PROCESSES

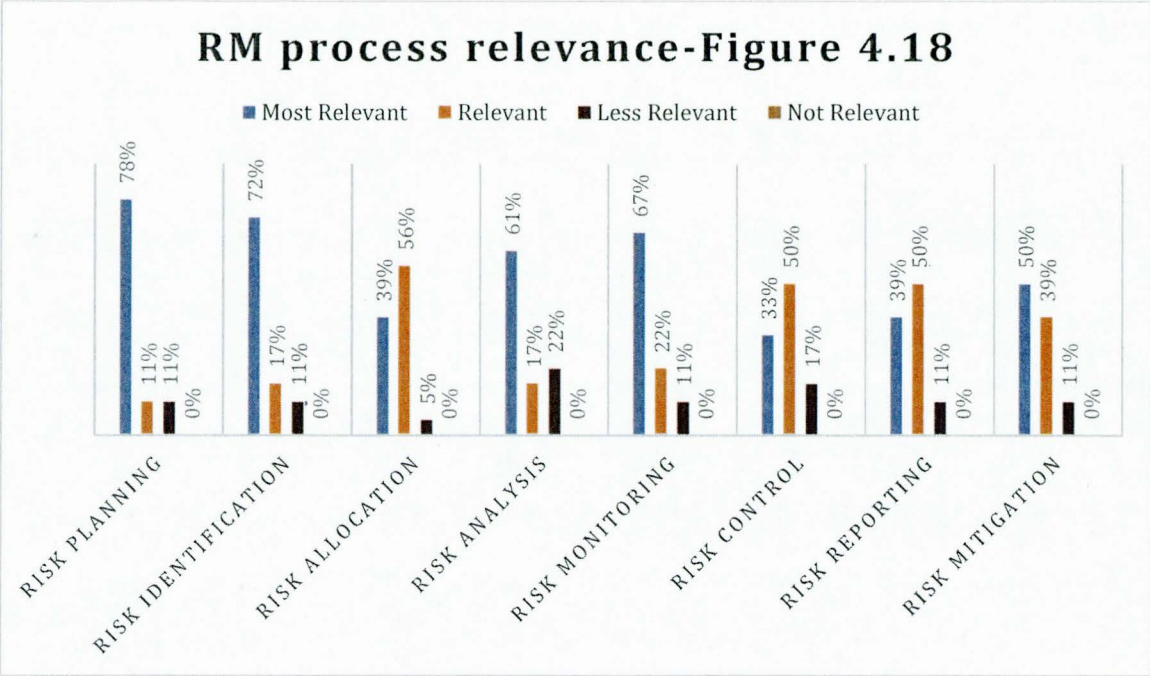
4.3.0. Relevance of each RM process

The 4-point Likert scale was used as an analysis tool to measure how relevant each RM process was perceived by contractors when managing a risk in their projects. The following results were recorded:

1. ***Most relevant*** ***2. Relevant*** ***3. Less relevant*** ***4. Not Relevant***

Table 4.8

Relevance of each RM process	**1**	**2**	**3**	**Total**
1.Risk Planning	**14** (78%)	**2** (11%)	**2** (11%)	**18= 100%**
2.Risk Identification	**13** (72%)	**3** (17%)	**2** (11%)	**18= 100%**
3.Risk Allocation	**7** (39%)	**10** (56%)	**1** (5%)	**18= 100%**
4.Risk Analysis	**11** (61%)	**3** (17%)	**4** (22%)	**18= 100%**
5.Risk Monitoring	**12** (67%)	**4** (22%)	**2** (11%)	**18= 100%**
6.Risk Control	**6** (33%)	**9** (50%)	**3** (17%)	**18= 100%**
7.Risk Reporting	**7** (39%)	**9** (50%)	**2** (11%)	**18= 100%**
8.Risk Mitigation	**9** (50%)	**7** (39%)	**2** (11%)	**18= 100%**



4.3.1. RISK PLANNING

Seventy-eight percent of respondents indicated that risk planning is the most relevant activity in risk management, eleven percent believed risk planning is a relevant activity and the other eleven percent said risk planning is a less relevant activity in RM.

4.3.2. RISK IDENTIFICATION

Seventy-two percent of respondents indicated that risk identification is the most relevant activity in risk management, seventeen percent believed risk identification is a relevant activity and the other eleven percent said risk identification is a less relevant activity in RM.

4.3.3. RISK ALLOCATION

Fifty-six percent of respondents indicated that risk allocation is a relevant activity in risk management, thirty-nine percent believed risk allocation is the most relevant activity and the other five percent said risk allocation is a less relevant activity in RM.

4.3.4. RISK ANALYSIS

Sixty-seven percent of respondents indicated that risk analysis is the most relevant activity in risk management, twenty-two percent believed risk analysis is less relevant activity and the other seventeen percent said risk analysis is a relevant activity in RM.

4.3.5. RISK MONITORING

Sixty-seven percent of respondents indicated that risk monitoring is the most relevant activity in risk management, twenty-two percent believed risk monitoring is a relevant activity and the other eleven percent said risk monitoring is a less relevant activity in RM.

4.3.6. RISK CONTROL

Fifty percent of respondents indicated that risk control is a relevant activity in risk management, thirty-three percent believed risk control is the most relevant activity and the other seventeen percent said risk allocation is a less relevant activity in RM.

4.3.7. RISK REPORTING

Fifty percent of respondents indicated that risk reporting is a relevant activity in risk management, thirty-nine percent believed risk reporting is the most relevant activity and the other eleven percent said risk reporting is a less relevant activity in RM.

4.3.8. RISK MITIGATION

Fifty percent of respondents indicated that risk mitigation is the most relevant activity in risk management, thirty-nine percent believed risk mitigation is a relevant activity and the other eleven percent said risk mitigation is a less relevant activity in RM.

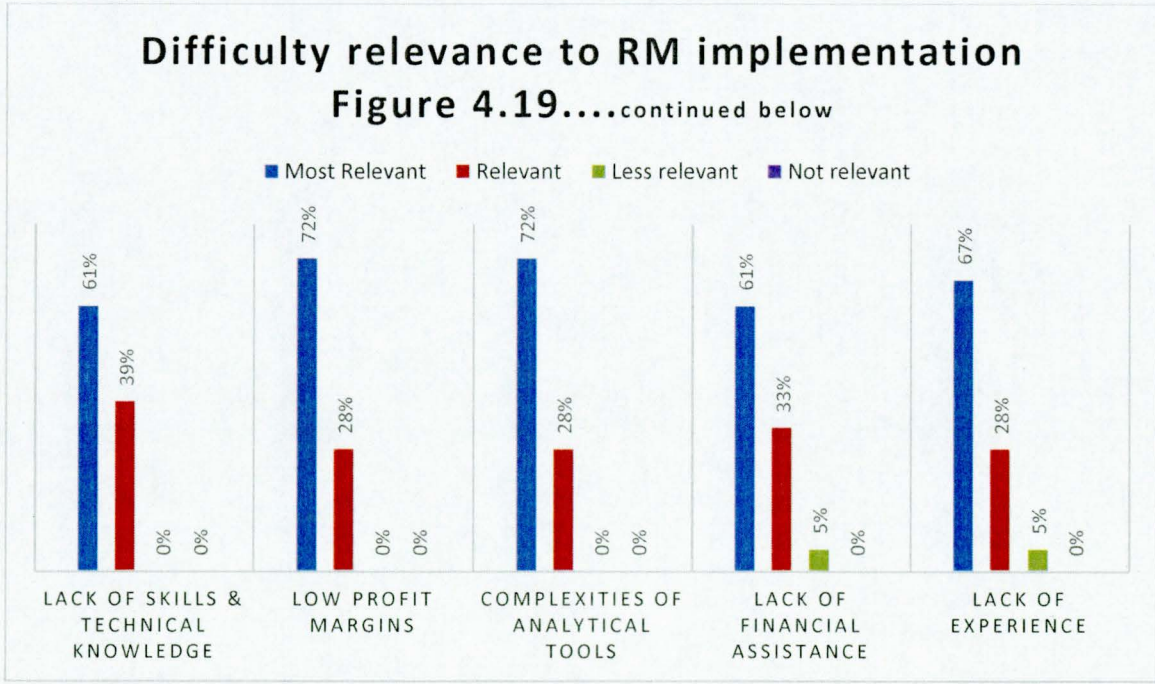
4.4. RELEVANCE OF EACH DIFFICULTY TO RM IMPLEMENTATION

The 4-point Likert scale was again used as an analysis tool to measure how relevant each difficulty was perceived by contractors when implementing RM in their projects. The following results were recorded:

Most relevant ***2. Relevant*** ***3. Less relevant*** ***4. Not Relevant***

Table 4.9

Relevance of each Difficulty in the RM Implementation	**1**	**2**	**3**	**Total**
Lack of skills and technical knowledge	**11** (61%)	**7** (39%)	0%	**18=100%**
Low profit margins	**13** (72%)	**5** (28%)	0%	**18=100%**
Complexities of analytical tools	**13** (72%)	**5** (28%)	0%	**18=100%**
Lack of financial assistance	**11** (61%)	**6** (33%)	**1** (5%)	**18=100%**
Lack of experience	**12** (67%)	**5** (28%)	**1** (5%)	**18=100%**
Insufficient capital to implement RM	**12** (67%)	**5** (28%)	**1** (5%)	**18=100%**
Lack of Mentorship	**12** (67%)	**4** (22%)	**2** (11%)	**18=100%**
Lack of RM specialists	**11** (61%)	**7** (39%)	0%	**18=100%**
Lack of manpower	**6** (33%)	**10** (56%)	0%	**18=100%**
Competition within the Industry	**11** (61%)	**5** (28%)	**2** (11%)	**18=100%**



4.4.1 LACK OF SKILLS & TECHNICAL KNOWLEDGE

Sixty-one percent of respondents viewed lack of skills and technical knowledge as the most relevant difficulty in their implementation of RM, thirty-nine percent said lack of skills and technical knowledge is relevant but not difficult in the implementation of RM in projects.

4.4.2 LOW PROFIT MARGINS

Seventy-two percent of respondents indicated that low profit margins are the most relevant difficulty in the implementation of RM in projects, whereas twenty-eight percent viewed low profit margins as relevant but not a defining factor.

4.4.3 COMPLEXITIES OF ANALYTICAL RM TOOLS

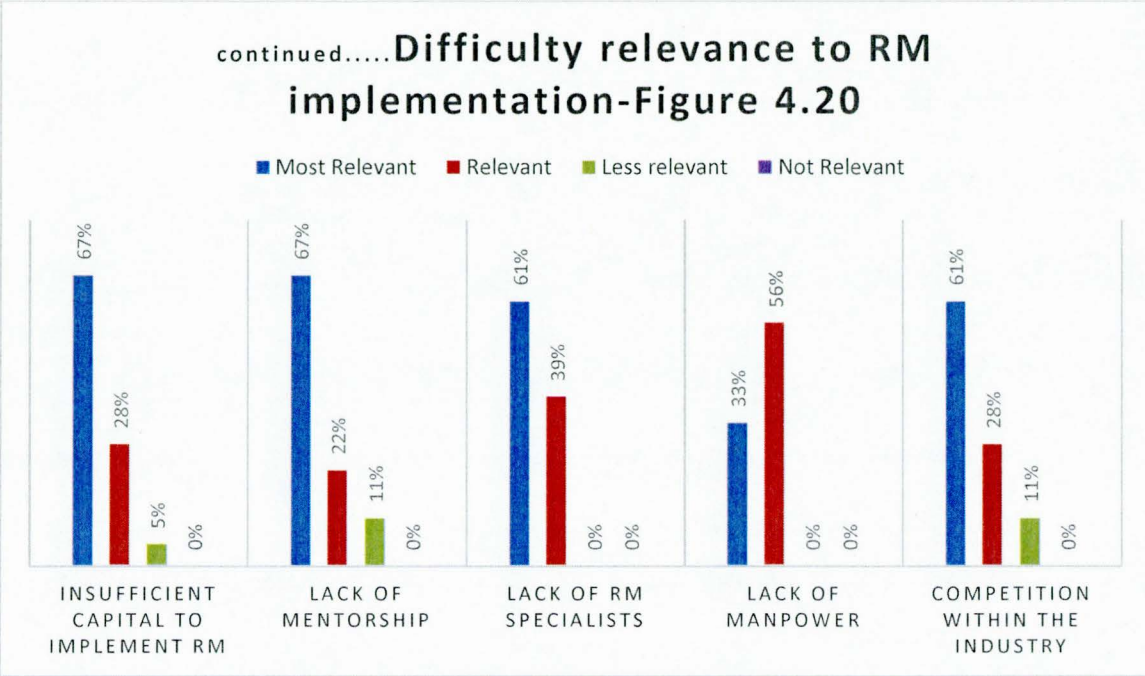
Seventy-two percent of respondents viewed complexities of RM analytic tools as the most relevant difficulty in the implementation of RM in projects, whereas twenty-eight percent viewed complexities of RM analytic tools as relevant but not a defining factor.

4.4.4 LACK OF FINANCIAL ASSISTANCE

Sixty-one percent of the respondents observed a lack of financial assistance as the most relevant difficulty in the implementation of RM on projects, thirty-three percent viewed a lack of financial assistance as a relevant difficulty and five percent responded that a lack of financial assistance is not at all a relevant difficulty in the implementation of RM in projects.

4.4.5 LACK OF EXPERIENCE

Sixty-seven percent of the respondents observed a lack of experience as the most relevant difficulty in the implementation of RM on projects, twenty-two percent viewed a lack of experience as a relevant difficulty and five percent said a lack of experience is not at all a relevant difficulty in the implementation of RM in projects.



4.4.6 INSUFFICIENT CAPITAL TO IMPLEMENT RM

Sixty-seven percent of the respondents observed insufficient capital to implement RM as the most relevant difficulty in the implementation of RM on projects, twenty-two percent viewed insufficient capital to implement RM as a relevant difficulty whereas, five percent indicated that insufficient capital to implement RM is not at all a relevant difficulty in the implementation of RM in projects.

4.4.7 LACK OF MENTORSHIP

Sixty-seven percent of the respondents observed a lack of mentorship as the most relevant difficulty in the implementation of RM on projects, twenty-two percent viewed a lack of mentorship as a relevant difficulty and eleven percent said a lack of mentorship is not at all a relevant difficulty in the implementation of RM in projects.

4.4.8 LACK OF SPECIALISTS

Sixty-one percent of the respondents observed a lack of specialists as the most relevant difficulty in the implementation of RM on projects, thirty-nine percent viewed a lack of specialists as the relevant difficulty in the implementation of RM in projects.

4.4.9 LACK OF MANPOWER

Fifty-six percent of the respondents observed a lack of manpower as a relevant difficulty in the implementation of RM on projects, thirty-three percent viewed a lack of manpower as the most relevant difficulty in the implementation of RM in projects.

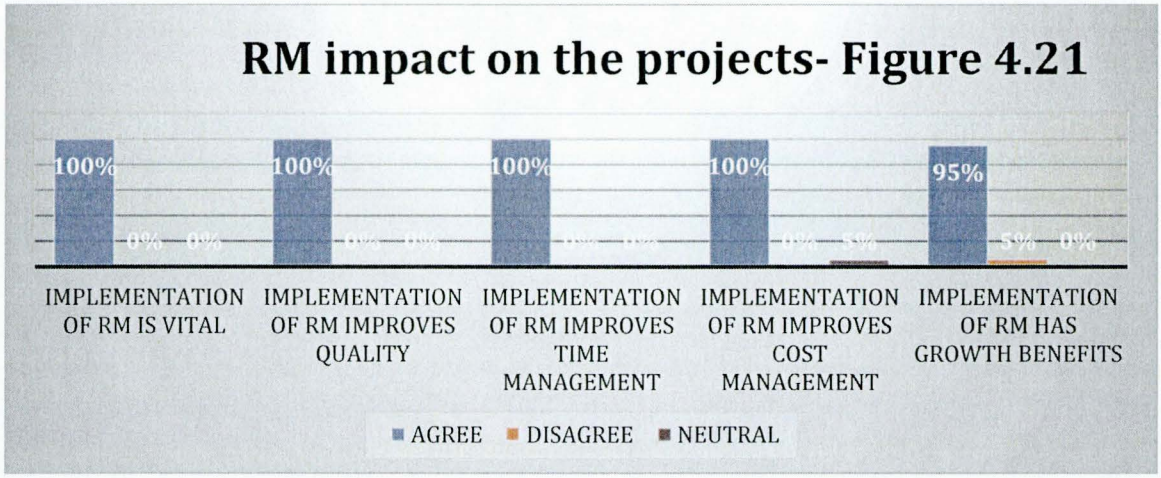
4.4.10 COMPETITION WITHIN THE INDUSTRY

Sixty-one percent of the respondents observed competition within the industry as the most relevant difficulty in the implementation of RM on projects, twenty-two percent viewed competition within the industry as a relevant difficulty and eleven percent said competition within the industry is not at all a relevant difficulty in the implementation of RM in projects.

4.5 SECTION C: PERCEPTION TOWARDS RM IMPLEMENTATION AMONGST SMME's

The following table illustrates the impacts of RM implementation as perceived by small contractors in the South African construction industry.

4.5.1 RM IMPACT ON PROJECTS



4.5.1 All eighteen respondents (100%) sampled on this study agreed that RM implementation on the project is vital.

4.5.2 All eighteen respondents (100%) sampled on this study agreed that RM implementation as a catalyst in the improvement of quality standards on the projects.

4.5.3 All eighteen respondents (100%) sampled on this study agreed that RM implementation on the project is important in improving time management on the projects.

4.5.4 Ninety-five percent of respondents perceived RM implementation on the projects to contribute in management of cost on the projects whereas, 5% remained neutral on the statement.

4.5.5 Ninety-five percent of respondents perceived RM implementation on the projects to assist in the growth of the organization whereas, five percent disagreed with the statement.

4.6 SECTION D: PERCEPTION TOWARDS RM IMPLEMENTATION AMONGST SMME's

4.6.1 Respondents were requested to state in their own words on difficulties that may have not been discussed by Section B and Section C. Responses from the respondents were in general agreement that the major difficulty they were experiencing in the order of

importance in the effective implementation of RM were obtaining budget to implement, lack of expertise and specialists, and lastly sourcing of materials.

4.6.2 Respondents were requested to state in their own words on risk factors that may have not been discussed by Section B and Section C. Responses from the respondents were in general agreement that the types of risks that was prevalent throughout the project in the order of importance were political influences in projects, lack of expertise, and lastly budget to sustain RM on the project.

4.6.3 Respondents were then requested to name the order of processes in their organisation when implementing RM. The respondents in general understood the order of the processes and named them as Risk Planning, Risk Identifying, Risk Allocation, Risk Monitoring, Risk Reporting, Risk Control and Risk Mitigation. This gave an indication that small contractors understand the fundamentals of RM implementation processes.

4.6.4 To obtain a view on the comprehension of small contractors on the tools used to manage risk, their unison agreement was that they perceive brainstorming to put a risk register in place as the most and common/friendly tool.

4.7 SECTION E: SUMMARY AND CONCLUSION

4.7.1 Analysis and descriptions were made from the data collected from the sampled respondents. Microsoft Word and Excel programs were utilized to present the graphics as tables, figures and graphs. Data was scrutinized based on the frequency of occurrence and then divided by the total number of respondents involved and presented as a percentage of probabilities. This chapter focused on the analysis of data collected utilizing a mixed method to scrutinize data from respondents. Section A-C results of data were analysed quantitatively, and Section D results of data were analysed qualitatively.

The next which is Chapter 5 will focus on the discussion of findings and linking results to the literature review.

CHAPTER 5: DISCUSSION OF FINDINGS AND LINKAGE TO LITERATURE

5.0. INTRODUCTION

In this chapter findings from the data analysis in Chapter 4 will be discussed and linked to the literature review as reviewed in Chapter 2.

The focal point of this study attempted to cover research objectives as the axis in the current treatise and furthermore collected data from eighteen different small contractors to compare their perception to literature summative.

The following objectives formed axis of the study:

- To identify the key difficulties to effective implementation of risk management by small contractors in South Africa.
- To identify risks types related to small contractors in South Africa.
- To determine risk management processes related to small contractors in South Africa.

5.1. PROFILLING OF RESPONDENTS ON SECTION-A OF QUESTIONNAIRE

5.1.1. ANALYSIS OF GENERAL AND COMPANY INFORMATION

On the 13th July 2018 a meeting was convened between the researcher and two respondents who had previously qualified from the GDHS Incubator program, the content of the meeting was to test the survey tool. The objective of the pre-test questionnaire was to obtain critiques from the respondents. The feedback from the pilot study was incorporated to prevent ambiguity and enhance the quality of the questionnaire.

The questionnaire was considered comprehensive of all objectives of the survey but feedback from the pre-test respondents would indicate if there were improvements required to produce a credible questionnaire. The two pilot respondents were briefed through the ethical consideration protocol as discussed under section 1.11.

The survey was conducted on eighteen individuals who represented 18 small companies registered on the GDHS Database for Incubator program. The researcher utilized a quarterly review progress meeting dated the 20th August 2018 to source data from the respondents.

Majority of respondents at eighty-two percent combined represented the youth in the survey, where twelve percent represented the adult group of the sampled respondents. All respondents were founding members of the company and were employing 1-20 employees in their respective companies. Majority of these respondents specialized in building as their forte within the construction industry.

The questionnaire further provided profiling of respondents on the bases of their experience within the construction industry and the majority of eighty-four percent represented an experience of 6 years and below, with the other percentage being above 6 years in practice. Majority of respondent's findings reflected to have completed a maximum of 2 projects in the last 3 financial years with RM systems in place, but the projects under discussion reached practical completion late.

5.2. ANALYSIS ON SECTION-B OF THE QUESTIONNAIRE

5.2.1. DIFFICULTIES IN THE MANAGEMENT OF EACH RISK TYPE

In section B (1) of the questionnaire, ten possible risk types were presented to the respondents. These ten possible risk types towards RM implementation amongst SMME's were presented to respondents to determine if respondents can identify a risk on their projects by rating the risk to the extent of the difficulty a risk presented in the management thereof. The respondents were presented with 4 possibilities where 1 represented- (very difficult to manage), 2 represented (sort of difficult to manage), 3 represented-(not difficult to manage) and last 4 represented- a (do not know) response. Further to the 10 possible risks presented, respondents were requested in section D (2) to indicate any risk types that was not mentioned on the list of 10 presented on the questionnaire. Analysis of data on section 4.2.1-4.2.10 was captured, scrutinized and analyzed based on the frequency then divided the

outcome by the total number of respondents. The results were presented graphically as a percentage of probabilities.

The findings from the survey indicated that respondents rated the 10 presented risks to SMME's in the order as follows:

The first record being the most difficult to manage and the last being the not difficult to manage: Attaining consistent cashflow on the project, E-business and technological risk, Attaining client approvals, Political interference risks, Management of Employees, Growth Risks, Interest rate Risks, Supply Chain Risk, Availability of mentorship on the project risks whereas, Material procurement Risk was rated as not at all difficult to manage.

Literature review on the types of risks prevalent to SMME's as presented in section 2.4.1 indicated the same but on a different order. Falkner and Hielb (2015) on their study recorded: Interest rate risk, Raw materials risks, E-business and technological risks, Supply Chain Risks, Growth Risks, Management & Employees Risks. Zou *et al.,* (2006) and Mbachu & Nkando (2007) in their findings found Socio-Political Risks as one of the risks which added from the risk's types recorded by Falkner and Hiebl, (2015). Studies conducted in South Africa by Shunmugan and Rwelamila, (2014) made an addition of one more risk as prevalent to SMME's were: attaining of relevant approvals from the client thus differentiating their findings from other researchers in the field. The literature review was found to consistent with the data collected from the survey, the difference in the findings was the order of classification.

Conclusion towards the analysis on the findings above stated deduced that SMME's within the South African construction industry are able to differentiate and identify the type of risk on their projects. Validation on the statement inferred is concurred by Dominguez and Paiva, (2018) and PMBOK, (2007) that the main goal of identifying risks is to generate an organized and structured list of identified risks, showing their characteristics, causes and consequences, so as it can be used during next phases or even in other projects.

5.2.1. RELEVANCE OF THE RM PROCESSES TO THE SMALL PROJECTS

In section B (2) of the questionnaire, eight RM processes were presented to respondents. These risk management processes were presented to verify whether respondents were aware

of the RM processes and the order of which they unfold in a project. The Risk management processes were presented in the following classification: Risk Planning, Risk Identification, Risk Allocation, Risk Analysis, Risk Monitoring, Risk Control, Risk Reporting, Risk Mitigation PMI, (2008). The respondents were requested to rate the relevance of each RM process using a 4-point Likert scale, as a rating tool grading where:

1.Most relevant ***2. Relevant*** ***3. Less relevant*** ***4. Not Relevant***

The survey results revealed, Risk Planning at 78% was rated the most relevant RM process followed by Risk Identification at 72%, Risk Monitoring at 67%, Risk Analysis at 61%, Risk Mitigation at 50%, Risk Allocation at 39%, Risk Reporting at 39% and Risk Controlling at 30%. The findings from the survey indicated that respondents have a clear understanding of the RM processes but not the order of which processes unfold in a project.

The survey concurred with literature that the decomposition of RM is divided into processes, activities or stages whose definitions alter with the authors, however the meaning and objectives remains the same Dominguez and Paiva, (2018).

The results from the survey agreed with literature review where an indication was deduced from several researchers who proposed various RM processes in projects. Boehm, (1991) proposed a two-phase process of risk management consisting of risk assessment phase which is made up of three steps; identification, analysis and prioritization; and risk control phase made up of risk management planning, risk resolution and monitoring, and risk tracking and corrective actions. Fairley, (1994) suggested seven steps of project risk management – risk identification; risk probabilities and effect assessment; creation of strategy to mitigate identified risks; monitoring risk elements; invoking a contingency risk plan; treatment of the risk; and recovering from the risk. Furthermore, Serpella *et al.,* (2014) and Nieto-Morote & Ruz-Vila (2011) reinforced that RM comprises of 4 stages-Risk Identification, Risk Assessment, Risk response, Risk monitoring and review.

In conclusion to the above- mentioned literature review on RM processes shows a general agreement of what is entailed in the RM processes. The differences in the various RM processes are the level of steps or activities of each process thus concurring with the results

from the survey and with the notion from Verbano and Venturini, (2013) study which underpinned that RM implementation is detrimental to any business and should not be overlooked.

5.2.2. SMME's DIFFICULTIES IN RM IMPLEMENTATION

In section B (3) of the questionnaire, ten possible difficulties were presented to respondents. These 10-possible risk management implementation difficulties were presented to identify the key difficulties that small contractors were faced with on their projects. Further to the presented possibilities, respondents were requested in section D (1) to indicate any difficulty that was not mentioned on the list of 10 presented on the questionnaire.

The respondents were requested to rate the difficulty relevance to RM implementation using a 4-point Likert scale, as a rating tool grading where:

1.Most relevant ***2. Relevant*** ***3. Less relevant*** ***4. Not Relevant***

The survey results indicated, Low profit margins at 72% and Complexities of analytic tools at 72% was rated the highest amongst difficulties towards RM implementation by small contractors. These results partly concurred with the finding by Hwang *et al.,* (2014) who recorded in their studies that low profit margins were a significant barrier towards effective RM implementation in Singapore but in the same notion the findings were contradicting to (Ibid) on the other findings on their study which were lack of time and lack of budget for RM implementation. On the other hand, the results from this treatise corresponded with studies from Chihuri and Pretorius, (2010); Shunmugan and Rwelamila, (2014); Marcelino-Sa'daba *et al.,* (2014) and Fischer, (2015) who presented a similar finding of complexities of analytic tools as a difficulty or barrier in their term.

The second ranking difficulties on the respondent's results were: all three scored at 67%, 1. lack of time, 2. insufficient budget to implement RM and 3. lack of mentorship. These findings are underpinned by Hwang *et al.,* (2013) and Fischer, (2015) who again mentioned lack of time as one of the "barriers" in RM implementation. Renault *et al.,* (2016) on their appraisal

conducted in South Africa mentioned insufficient budget to implement RM/lack of financial assistance as one of the difficulties. Nowhere in the literature reviewed by the researcher was the lack of mentorship mentioned as one of the difficulties towards RM implementation, but it can be argued that Kikwasi, (2011) in the study conducted in Tanzania mentioned consultant's reluctance to practise RM as one of the challenges in RM. This finding by (Ibid), on the bases of the researcher's comprehension of PM processes, mentorship can be argued to be an extension of practises that fall under responsibilities of consultants in a project. Sukumar *et al.,* (2011) and Lehtiranta, (2013) confirmed to the above that in SMME's, employee development is rarely offered. To underpin the second ranked difficulties towards an effective RM, literature was found to have grounded literature in (Hwang *et al.,* 2014; Fischer, 2015 and Kwikasi, 2011) in no particular order.

The third ranking difficulty on the respondent's results, revealed three scorings at 61% were 1. lack of skills and technical knowledge, 2. lack of RM specialists, and 3. competition within the industry. Lack of knowledge was identified as one of the difficulties experienced in RM by authors Chihuri and Pretorius, 2010; Serpela *et al.,* 2014; Fischer, 2015; and Dominguez & Paiva, 2018). These studies as identified, referred on their findings the difficulty of "lack of skills" which can be reasoned to mean one and the same thing with lack of technical knowledge or lack of specialists. The authors concurred with the findings on this treatise that lack of skills and knowledge is a difficulty towards RM implementation. Competition within the industry was also identified as a difficulty by respondents which, Abdul-Rahman *et al.,* (2015) in a study conducted in Malaysia also recognised that competition amongst small contractors is a challenge when banks are reluctant to provide finance to companies with the least collateral.

The last difficulty that was presented to the respondents was lack of manpower. This difficulty ranked the lowest at 33%. This difficulty was mentioned by Fischer, (2015) as one of the barriers that ranked the lowest in his study also. Based on this deduction on this difficulty, it proved that lack of manpower is a difficulty on SMME's RM implementation but on a lower scale. Lack of manpower was mentioned by respondents in section D (1) as an additional difficulty that was not mentioned in section B (3).

The highest-ranking difficulties in this study was found to be low profit margins and complexities of the analytic tools. These findings are contrary to difficulties recorded by

Dominguez and Paiva (2018) in Portugal, who mentioned that lack of material control and lack of knowledge were more significant difficulties. A dissimilarity is further noted between this treatise and the study conducted by Rostami *et al.,* (2015) in the UK who highlighted that scaling of RM processes was the highest ranking difficult, conversely Ubani *et al.,* (2015) in Nigeria indicated lack of awareness as the highest ranking difficulty in their findings whereas Renault *et al.,* (2016) in South Africa- Gauteng revealed supply of faulty material, lack of communication, financial failures as critical factors in SA projects.

The findings in this treatise was partially in agreement to the difficulties as recorded by (Fischer, 2015; Shunmugan and Rwelamila 2014; Chihuri and Pretorius 2010; Rostami *et al.,* 2015), on complexities of analytical tools as a barrier/challenge/difficulty but was contrary on the ranking as the highest thereof. On low profit margins as a difficulty a similarity of findings was supported by Hwang *et al.,* (2014) on their study conducted in Singapore but again was contrary to the ranking as the highest difficulty.

5.3. ANALYSIS ON SECTION-C OF THE QUESTIONNAIRE

5.3.1. PERCEPTION TOWARDS RM IMPLEMENTATION AMONGST SMME's

In section C of the questionnaire, 5 questions were presented to the respondents. These 5 questions reflected a theme of awareness the small contractors had in relation to RM implementation within their projects.

The respondents were given three options on their responses by: Agreeing, not agreeing or to remain neutral.

5.3.1.1. IMPORTANCE OF RM PLAN IN PROJECTS

The survey results in section C(1) revealed a 100% response in agreement that implementation of risk management is vital in the overall performance of a project .This response is similar to findings by authors such as (Hwang *et al.,* 2013; Serpella *et al.,* 2014; Zou *et al.,* 2006) who suggested in their studies that implementation of risk management is a

significant component in construction projects. Likewise, Hoffman *et al.,* (2012) highlighted the many reasons small contractors should implement RM, such as protection of assets and longer-term viability of small firms.

5.3.1.2. IMPORTANCE OF RM TO IMPROVE COST AND QUALITY OF WORK

The survey results in section C (2), C (3) and C (4) revealed a hundred percent response in agreement that implementation of risk management improves quality of work, cost management and time management in the project. A correlation of secondary data to the findings that risk can affect productivity, performance, quality and budget of a project can be established in Mills, (2001). A contrasting, five percent of respondents decided to remain neutral when asked whether implementation of risk management does improve cost management in a project.

5.3.1.3. IMPORTANCE OF RM AS A GROWTH CATALYST

The survey results in section C (5) revealed a ninety-five percent response in agreement that implementation of risk management provides overall growth of the organization. Marcelino-Sa'daba *et al.,* (2014) advised in their study that growth in SMME entities is accomplished through projects. Islam *et al.,* (2012) suggested that RM is less developed within SMME's, despite the evidence that entities that adopt RM strategies are more likely to grow and survive. Only five percent of respondents disagreed that implementation of risk management provides overall growth of the organization.

5.4. CONCLUSION

In Chapter 5, findings from the survey were discussed and linked to literature review by contrasting and comparing of primary data to literature. The next Chapter (6) will draw a conclusion, provide recommendations and suggest on future research opportunities within the subject area.

CHAPTER SIX:
CONCLUSION, RECOMMENDATION & FUTURE RESEARCH OPPORTUNITIES

6.0. INTRODUCTION

This Chapter will conclude the whole research report, provide recommendations and suggest on future research opportunities within the subject area. It will highlight the discoveries that linked the literature review to the questionnaire.

6.1. CONCLUSION

The study in Chapter 1 set out to identify the key difficulties experienced by small contractors in the implementation of risk management within the South African construction industry. With reverence to the aim of the study, it can be determined that the respondents in the study believed that complexities of analytic tools and low profit margins are key difficulties towards RM implementation within the South African construction Industry. The two key difficulties ranked the highest on the findings. These findings addressed and answered the aim of the study and proved the hypothesis to be correct. Additional difficulties were identified and are recorded in a descending order in the study as follows:

- ✓ Lack of mentorship,
- ✓ Lack of experience/expertise/skills or technical knowledge,
- ✓ Lack of budget/financial assistance,
- ✓ Competition within the industry and,
- ✓ Lack of manpower.

The study revealed that small contractors have a clear understanding of RM, risk types, tools, techniques and processes hence they were able to identify the key difficulties they are experiencing in the implementation of projects. On the other hand, literature revealed a whole range of types of risks related to small contractors but did not provide a clear consensus on the categorization method of risk as a type or a source. Additionally, in literature the order of RM processes varied from author to author when discussing small contractors or SMME's

within the construction industry. The findings revealed a clear understanding of the RM processes of respondents, but the order varied from respondent to respondent. The findings further revealed that SMME's are slowly adapting to the integration of RM strategies in their projects but showed evidence of being reactive in their application. It was further noted in this research report that literature dealing explicitly with RM in SMME's within the SA construction is limited.

6.2. RECOMMENDATIONS

From the current study, it can be determined that even though the complexities of analytic tools and low profit margins are mostly viewed as the key difficulties towards RM implementation by SMME's, it is further acknowledged in the findings that lack of mentorship, lack of experience/expertise/technical knowledge are critical factors intertwined with the 2 highest ranking difficulties that impede RM implementation within small contractors in the South African construction industry.

Against the background of the findings, the respondents are aware of the importance and benefits of having a risk management plan in place, what they lack is a practical RM framework that specifically provides a step by step guidance to a small project. This can be achieved by incorporation of a mentor on the project to guide, develop and train small contractors on RM implementation guidelines. This proposed tool or framework can be used to plan, identify, assess, allocate, monitor and record all possible risks thus maximising all possible benefits to meet project objectives.

To remedy and promote the implementation of RM by small contractors it is recommended in this treatise that government can play a role in bridging the funding for development of a fit for purpose tool to assist SMME's in the effective implementation of risk management in all their projects.

6.3. FUTURE RESEARCH OPPORTUNITIES

- The current study was undertaken to fill an identified literature gap pertaining to key difficulties experienced by small contractors in the implementation of risk management within the South African construction industry. Further research may embark to validate the current findings by targeting a larger population to include a wider representative of the South African construction industry particularly on the CIDB list of small contractors as this was a limitation in the current study.

- As an extension to the current study, evaluation of the Pro-Risk framework can be tested as an effective RM strategy towards RM implementation for small contractors within the SA construction industry as presented by Chawan, (2012), which concurs with a study conducted by Nawaz, *et al.,* (2019) that this framework is effective enough to manage risk and minimize time of project completion.

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8. ANNEXURE A-QUESTIONNARE OF THE STUDY

Information Sheet

Re: Dissertation – MSc in Building (Project Management)

My name is Bongekile Kunene with student number 1762660 and under Lungie Maseko's supervision. I am currently studying towards an MSc Degree-Building (Project Management) at the University of the Witwatersrand. In fulfilment of this research report I am required to research a topic area and produce a dissertation. The topic I have chosen is ***"Difficulties towards Risk Management implementation: small contractors in the South African construction industry"***.

The objectives of my topic are:

- To identify the major difficulties to successful implementation of risk management by small contractors in South Africa.
- To identify risks types related to small contractors in South Africa.
- To determine risk management processes related to South African small contractors for enhancement of sustainability and competitiveness in the industry.

This study is embarked on for academic purposes only, no remuneration will be offered for participation in this study. Once this study is complete, it will be made available to participants and available on the public domain. Participation in this study is voluntary and a participant reserve a right to withdraw or decline at any point. The information provided by the participant in this study will be treated with strict confidence. Individual firms and participants personal information will not be identified and will remain anonymous.

Only 15 minutes will be required to complete the attached questionnaire. I can be contacted by email at address: 1762660@student.wits.ac.za. My supervisor is available should a need arise for any comments or confirmation at lungie.maseko@wits.ac.za.

Yours faithfully,

Bongekile Kunene

Email: 1762660@student.wits.ac.za or Bongekile.kunene@gauteng.gov.za

Cell no. 083 9500 432 or 011 861 3059

Consent Form

Respondents in the research report:

Difficulties towards risk management implementation: small contractors in the South African construction Industry

You are requested to be part of a research study that I (Bongekile Kunene) am currently undertaking as part of a submission towards the MSc Degree-Building (Project Management). You have been identified as a possible valuable participant to the study. I ask that you read this form and may ask any questions before agreeing to participate.

If you agree to take part to this study, you are reassured that your participation poses no risk either to you or to your company. All information gathered in this study will be treated with the utmost confidentiality and respect. The decision to partake to this study is entirely up to you. You have a right to refuse or withdraw at any point of the interview. I confirm that your name and personal details other than your age, gender and occupation will be used in this report.

Your signature below indicates that you have read and understood the contents of this consent form together with the information sheet and have agreed to take part in this research out your own will.

Signature of participant: _____ Date: _____

Signature of researcher: _____ Date: _____

Researchers Name: Bongekile Kunene *Student Number: 1762660*

QUESTIONNAIRE OF THE STUDY

SECTION A-GENERAL

Give a tick for your choice

Questions	**Options**	✓ **Tick when choosing appropriate option for each question**
1. Herewith, I give consent that I am willingly partaking in this questionnaire and have not been forced or coerced by any means whatsoever.	Yes	
	No	
2. Kindly choose your username. *(This is to protect your identity).*		
3. Please indicate your gender and age.	Youth Male *(38 yrs and less)*	
	Youth Female *(38 yrs and less)*	
	Adult Male *(39 yrs and over)*	
	Adult Female *(39 yrs and over)*	
4. What is your job title or position within your organization?	Company Director (Founder)	
	Project Manager	
	Construction Manager	
	Contract Manager	

	Site Agent	
	QS or Cost Controller	
	Other (specify)	
5. Indicate relevant experience in years, in the current position within your organization?	0-3 years	
	4-6 years	
	7-10 years	
	More than 10 years	
6. How many employees work within your organization?	1 – 20	
	21 - 60	
	61- 150	
	151- 250	
	More than 250	
7. Which type of projects is your organization specializing on?	Building	
	Mechanical	
	Electrical	
	Civil works	
	All of the above	
	Other (specify)	
8. Does your organization have a Risk Management plan in the last 3 years?	Yes	
	No	
	In the process of acquiring	
9. How many projects your organization has completed in the past 3 years? *(less than R 10 million in monetary value) 2015*-2017		

8. How many projects your organization has completed in the past 3 years that comprised of a formal RM plan in place? *(less than R 10 million)*	
9. How many projects your organization has completed or was involved in, within the past 3 years that did not comprise of a formal RM plan in place? *(less than R 10 million)*	
10. What is the average duration in months of a small construction project you were involved in, that had no RM plan in place?	
11. What is the average duration in months of a small construction project involved in that had RM plan in place?	

SECTION B

Below are several factors which can contribute in the difficulties to implement risk management in small projects. From your experience, please express your opinion on how important each factor can be on influencing implementation of risk management in a project. (*Please tick the appropriate box*)

1. RATE THE LEVEL OF DIFFICULTY IN MANAGEMENT OF EACH TYPE OF RISK IN SMALL PROJECTS	Very difficult to manage	Sort of difficult	Not difficult	Do not know
1.1. Material procurement				

1.2. Interest rate risk				
1.3. E-business and Technological risk				
1.4. Political interference on the project				
1.5. Management of employees				
1.6. Growth Risk				
1.7. Supply chain processes by the client				
1.8. Attaining consistent cash flow on the project				
1.9. Attaining relevant approvals from the Client				
1.10. Mentorship availability on the project				
2. RANK THE RELEVANCE OF EACH RISK MANAGEMENT PROCESS TO ASSIST IN THE MITIGATION OF THE RISK IN YOUR OPINION *(1 being the most relevant 4 being the least relevant)*	1	2	3	4
2.1. Risk Planning				
2.2. Risk Identification				
2.3. Risk Allocation				
2.4. Risk Analysis				
2.5. Risk Monitoring				
2.6. Risk Control				
2.7. Risk Reporting				
2.6. Risk Mitigation				
3.RANK THE RELEVANCE OF EACH OF THE DIFFICULTIES STATED BELOW IN RISK MANAGEMENT IMPLEMENTATION EXPERIENCED BY SMALL CONTRACTORS *(1 being the most relevant 4 being the least relevant)*	1	2	3	4

3.1. Lack of skills and technical knowledge within the team.				
3.2. Low profit margins in the project.				
3.3. Complexities of analytic tools.				
3.4. Lack of financial assistance from either government or private entities.				
3.5. Lack of experience by organization.				
3.6. Insufficient capital to implement RM in the project.				
3.7. Lack of mentorship assistance from the professional team within the project.				
3.8. Lack of RM specialist on small projects.				
3.9. Lack of manpower within the organization.				
3.10. Competition among small contractors within the construction industry.				

SECTION C

According to your experience, please indicate your view or opinion with regard to the following:

(Tick or cross appropriate box)

	Agree	Disagree	Neutral
1. Implementation of risk management is vital in overall performance of small projects.			
2. Implementation of risk management improves quality standards of work in the project.			
3. Implementation of risk management improves time management in the project.			
4. Implementation of risk management improves cost management in the project.			

5. Implementation of risk management has potential benefits on the growth of the organization on small projects.			

SECTION D

Paragraph Questions:

1. In your own opinion, what is the major difficulty you are experiencing in the effective implementation of risk management?

1.1 Not listed in 3.1-3.10 under section B

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2. In your own opinion, which type of risk is most relevant to you as a small contractor when implementing risk management?

2.1 Not listed in 1.1-1.10 under section B

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3.3 According to your Risk Management plan in your organization, indicate which order of processes seem to be working for your organization?

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3.4 What tool is your organization utilizing to manage risk in your projects?

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THANK YOU FOR YOUR PARTICIPATION & CO-OPERATION!!!