Cape Peninsula
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IMPACT OF PARTNERING ON RISK MANAGEMENT WITHIN THE CONSTRUCTION INDUSTRIAL SECTOR IN LIMPOPO

by

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DECLARATION

I, Puledi Phineas Mabe, student number 217240224, declare that the contents of this dissertation/thesis represent my own unaided work, and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed: …… Date: …….

ABSTRACT

The construction industry sector is a very competitive high-risk area with many challenges such as little co-operation, lack of trust, and ineffective communication resulting in adversarial relationships between the contracting parties. Complexity and disputes are some of the inherent features of the construction sector. The study sought to establish the relationship between risk and partnering in projects and thus allow integration of project partnering and risk management models.

This study adopted a descriptive design and used a questionnaire to collect data, which was analysed using cross tabulation, correlational, and multiple regression approaches. A total of 107 questionnaires was distributed to respondents, contractors and project owners. Results suggest that clients and contractors do not see the importance and benefits of project partnering and hence are not focused on this concept. Identification with critical stage process postulates that clients and contractors see partnering as another way of getting the project done, conventional methods are an alternative. Results show 15% variation in the risk and partnering between project owners and contractors.

The statistical results indicate the general acceptance and importance of the hypothesis that service quality Intercept, Risk Identification, Risk planning, Risk assessment, Risk analysis and Risk response lead to the interpretation of the regression analysis since the researcher wants to identify the differences in the assessment of risk and partnering between project owners and contractors. Solutions such as proposing an effective risk management framework specific for Limpopo construction projects is still an outstanding area for research. Other areas for future research endeavours include evaluation of risk management effectiveness in donor-financed public projects and a risk management model for a competitive public infrastructure delivery.

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DEDICATION

This research study is dedicated to the Young family and my Mother, Raisibe Josephine Mabe, for all their love and constant support.

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ABBREVIATIONS AND ACRONYMS

AHP	Analytical Hierarchy Process
BDS	Building Design Services
BOOT	Build-Own-Operate-Transfer
BOQ	Bill of Quantities
BOT	Build-Operate-Transfer
CDP	Contractor Development Programme
CETA	Construction Education Training Authority
CF	Consequence of Failure
CIDB	South African Construction Industry Development Board
COMM	Lines of Communication
COSO	Committee of Sponsoring Organizations of the Treadway Commission
CPM	Critical Path Method
CPUT	Cape Peninsula University of Technology
CSF	Critical Success Factors
DPW	Department of Public Works
EMV	Expected Monetary Value
EPWP	Expanded Public Works Programme
ERM	Enterprise Risk Management
FST	Fussy Sets Theory
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GNDI	Gross National Disposable Income
ILO	International Labour Organization
JRM	Joint Risk Management
MFDP	Ministry of Finance and Development Planning
NCIDP	National Construction Industry Development Policy

NDPW	National Department of Public Works
NMPP	Transnet new multipurpose product pipeline
NYSP	National Youth Service Programme
PERT	Program Evaluation and Review Technique
PESTLE	Political, Economic, Social-cultural, Technological, Legal and Environmental
PFI	Private Finance Initiative
P-I	Probability Impact
PLC	Project Life Cycle
PM	Project Management
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMKA	Project Management Knowledge Area
PMO	Project Management Office
PPP	Public-Private Partnerships
PRAM	Project Risk Analysis and Management
PVC	Polyvinyl chloride
PWC	Price Waterhouse Coopers
RBS	Risk Breakdown Structure
RCR	Risk consequence rating
RD	Roads Directorate
RM	Risk Management
RPF	Risk Priority Factor
SARB	South African Reserve Bank
SPSS	Statistical Package for Social Sciences
TQM	Total Quality Management
TTRIT	Top Ten Risk Item Tracking
WBS	Work Breakdown Structure

GLOSSARY

POLICYMAKERS: The term 'policymaker' is widely used to refer to people who have political influence that directly develops or changes policies, regulations, rules and directives.

COMMUNICABLE DISEASE: Communicable diseases are illnesses caused by viruses or bacteria that people spread to one another through contact with contaminated surfaces, bodily fluids, blood products, insect bites, or through the air.

INFORMAL SETTLEMENTS: areas where groups of housing units have been constructed on land that the occupants have no legal claim to or occupy illegally.

INTERNAL CONTROL: is a process for assuring an organization's objectives in operational effectiveness and efficiency, reliable financial reporting, and compliance with laws, regulations and policies.

INTERNAL AUDIT: is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations.

CORPORATE GOVERNANCE: refers to the way in which companies are governed and to what purpose. It identifies who has power and accountability, and who makes decisions. In essence, a toolkit enables management and the board to deal more effectively with the challenges of running a company.

URBANISATION: is the process through which cities grow, and higher and higher percentages of the population come to live in the city.

LOCAL GOVERNMENT: authority to determine and execute measures within a restricted area inside and smaller than a whole state.

PUBLIC INSTITUTIONS: means any entity established or controlled by the federal government, state government, or a local government or municipality, including, but not limited to, institutions of higher education and related research institutions.

INTEGRATED DEVELOPMENT PLAN: is a super plan for an area that gives an overall framework for development. It aims to coordinate the work of local and other spheres of government in a coherent plan to improve the quality of life for all the people living in an area.

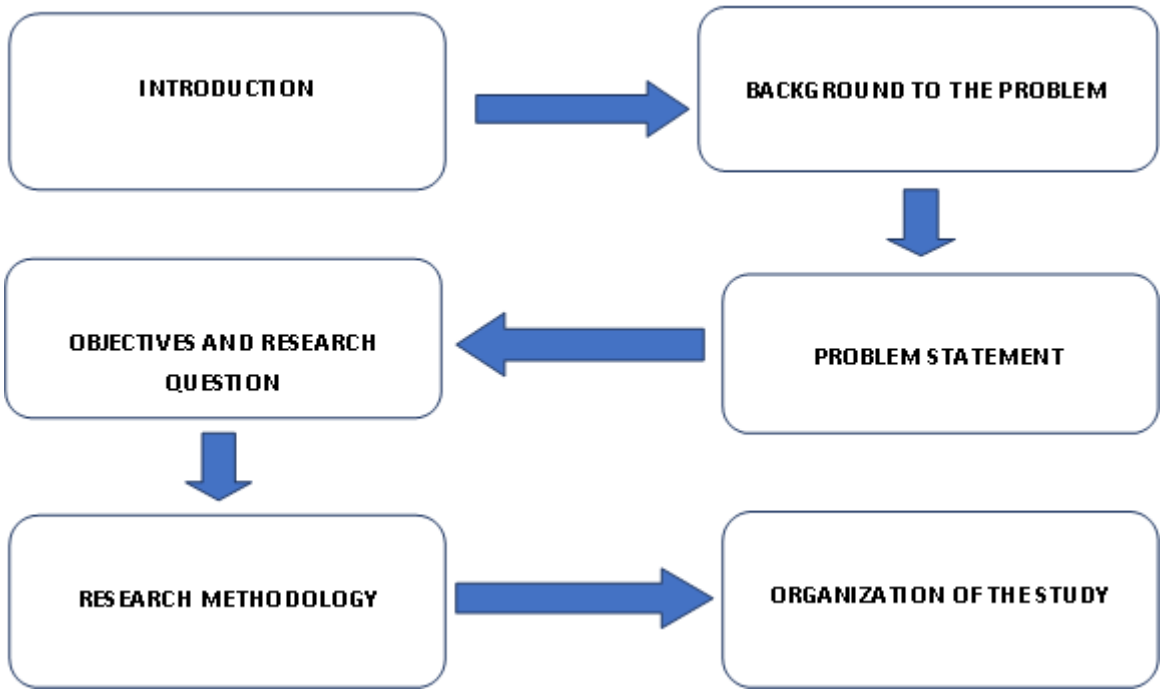
SERVICE DELIVERY: can be defined as any contact with the public administration during which customers – citizens, residents or enterprises – seek or provide data, handle their affairs or fulfil their duties.

LIVING CONDITIONS: refers to the circumstances of a person's life—shelter, food, clothing, safety, access to clean water, and such. An alternative definition might be "conditions for life," which refers to circumstances needed for physical or biological life to exist. This includes basic requisites for survival: water, energy, a suitable environment.

CHAPTER 1

ORIENTATION AND OVERVIEW OF THE STUDY

1.1 STRUCTURE OF THE CHAPTER



1.2 INTRODUCTION

The construction industry is a very competitive high-risk area with many challenges such as little cooperation, lack of trust and ineffective communication resulting in adversarial relationships between the contracting parties: the project managers and project owners. The owner and contractor are part of a temporary organisation created to achieve project objectives. Both parties have their context of culture, strategies, objectives, structures and systems that are not necessarily congruent. This affects risk management in projects (Larson & Gray, 2011).

The study explores project partnering as a strategic risk management approach in construction projects. Project partnering is generating considerable attention in the construction industry to transform hostile, adversarial owner-contractor relationships into a collaborative team approach.

Industry risk management consists of tools and processes applied in a specific organisational cultural context to assist in the achievement of organisational objectives.

When applied to projects, industry risk management is a process effected by the project's board of directors, management, and other personnel, applied in strategy setting and project management. The project risk process is designed to identify potential events that may affect the project and manage the risk to be within the risk appetite of the project organisation. The risk is managed to provide reasonable assurance regarding the achievement of project objectives (Committee of Sponsoring Organizations of the Treadway Commission [COSO], 2010:5).

Project partnering is a process of transforming contractual arrangements into a cohesive, collaborative team that deals with issues and problems encountered to meet a customer's needs (Larson & Gray, 2011). It assumes that the traditional adversarial relationship between the owner and contractor is ineffective and self-defeating and that both parties share common goals and mutually benefit from the successful completion of projects. It is a long-term commitment between two or more organisations for achieving specific business objectives by maximising the effectiveness of each participant's resources.

The relationship is based on trust, dedication to common goals, and an understanding of each other's individual expectations and values (Larson & Gray, 2011). Project partnering serves as a strategy for improving organisational relations and project performance in the construction industry. The project partnering approach encourages project partners to move from a traditionally adversarial attitude to a cooperative, team-based approach to prevent conflicts and disputes (Hang, 2000).

A study on the partnering between users and the developers in the project definition phase of information system projects indicated that there is a negative relationship between risk and partnering (Yu-Chin, 2013). There is no information on how partnering influence risk in all phases of projects in the construction industry the South African context. In this study, the relationship between project partnering and risk is investigated to provide a basis for integrating models for project partnership and project risk management in an effort to reduce risk in projects.

1.3 PROBLEM STATEMENT

The problem is the management of risk in projects because of the inherent dichotomy of divergent project goals between contractors and owners in construction projects. There is evidence that uncertain factors exist more in large projects where contracting and involvement of other parties are prevalent (Yan & Feng, 2014).

Partnering is a basis for project parties to adopt a "win-win" approach to solve problems and foster synergistic teamwork among the partnering parties by reducing cost overruns and delays as a result of better time and cost control over the project (Chan, 2009). However, does this approach provide a minimisation of risk for the contracting organisation and the owner organisation?

Ichihara and Pretorius (2010) report that 84% of project managers in South Africa use the risk management principles of the Project Management Body of knowledge (PMBOK), the Australian and New Zealand standards and the Project Risk Analysis and Management (PRAM) model. The project partnering approach could add value to these approaches.

The problem to be investigated is therefore to determine whether there is a correlation between the level of risk in projects and the level of project partnering in projects where inter-organisational relations exist.

1.4 AIM OF THE STUDY

The aim of the study is to identify the impact of partnering on risk management within the construction industry sector in Limpopo Province of South Africa.

1.5 OBJECTIVES OF THE STUDY

To achieve the aim of the study, the following objectives have been set:

- To determine the level of risk in projects where inter-organisational relations exist;
- To determine the level of partnering in projects where inter-organisational relations exist;
- To determine what the differences are in the assessment of risk and partnering between project owners and contractors.
- To determine what the correlation is between the level of risk and the level of project partnering; and
- To integrate risk models and partnering models to develop an approach to reduce risk through project partnering.

1.6 RESEARCH QUESTIONS AND RESEARCH HYPOTHESES

A hypothesis is a statement that can be proved or disproved. A research question can be made into a hypothesis by changing it into a statement.

1.6.1 Research questions

Research questions should specify the population of interest, be of interest to the scientific community and potentially to the public have clinical.

- What is the level of risk in projects where inter-organisational relations exist?
- What is the level of partnering in projects where inter-organisational relations exist?
- What are the differences between the assessment of risk and partnering between project owners and contractors?
- What is the correlation between the level of risk and the level of project partnering?
- How can risk models and partnering models be integrated to develop an approach to reduce risk through project partnering?

1.6.2 Research hypotheses

Hypothesis it is rats that receive an injection of substance a will consume significantly more food than do not receive the injection.

- There is no significant relationship between the level of risk in projects and the level of project partnering
- There is a significant negative relationship between the level of risk in projects and the level of project partnering.
- There is no significant difference between the assessment of partnering by the owner and the contractor respectively
- There is a significant difference between the assessment of partnering by the owner and the contractor respectively.
- There is no significant difference between the assessment of risk by the owner and the contractor respectively.
- There is a significant difference between the assessment of risk by the owner and the contractor respectively.

1.7 DEFINING PROJECT PARTNERING

Project partnering is a relationship strategy whereby a project owner integrates constructors and other contributors. It doesn't mean you are co-founding a company together or working together indefinitely.

1.7.1 Partnering/strategic partnering

Project partnering is defined as the relationships established for a project and at the end of the project, the partnering relationship is terminated, and another relationship is commenced on the next project; strategic partnering is regarded as a long-term commitment beyond a discrete project (Larson & Gray, 2011). The level of project partnering is measured by using a

questionnaire based on the critical success factors for project partnering. The questionnaire is attached as Appendix G.

1.7.2 Project risk

Project risk is a deviation from the expected value of an expected outcome. It implies the presence of uncertainty regarding the occurrence of an event and uncertainty regarding the outcome (impact) of the event. Controlling risk is a proactive attempt to recognise and manage internal events and external threats that affect the likelihood of a project's success (Larson & Gray, 2011). The project risk level in this study is measured by using a questionnaire developed from a questionnaire used by the Government of Canada that measures the risk and complexity of projects (Government of Canada, 2001:7).

1.8 LITERATURE REVIEW

The study uses an Enterprise Risk Management-Integrated Framework to identify the internal environment of the contractors. It identifies partnering challenges as a model which project parties come across. It identifies success critical factors to help contractors and project owners to attain their goals and also defines Project Management Body of Knowledge (PMBOK) and a model of testing if there is a correlation between the level of project risk and the level of partnering in the project.

A project lifecycle approach is identified to implement the project strategy successfully. Construction projects need to maintain their competitiveness and improve their performance (Chang & Shen 2009:44). In line with this streamlining effort, project parties need to have innovative management and procurement systems in the construction industry, including partnering, alliances and Total Quality Management (TQM), Whyte & Lobo (2010).

1.8.1 Enterprise risk management model

The enterprise risk management model is a comprehensive model into which the model of partnering will be integrated. It is the cultural process and tools to manage risk (Young, 2014). It is a robust framework developed to identify, assess and manage risk (COSO, 2010). It includes both operational and strategic risk. Risk management is an iterative process that should occur throughout the project life cycle and uses effective risk management techniques (Tonier Nicolai & Claudio, 2012).

An integrated framework for enterprise risk management is used in this study for describing and analysing the internal control system implemented in construction projects by contractors. This framework consists of eight interrelated components that are derived from the way management runs construction projects and are integrated with the risk management process.

These components are internal environment, risk planning, risk identification, risk assessment, risk response, control activities, communication and information and monitoring activities (COSO, 2010).

1.8.2 Project partnering

Partnering is formally regarded as a collaborative effort in construction to improve the adversarial relationship between owners and contractors (Dexter & Larson, 2009). Nauru and Kumaraswamy (2012) argue that partnering has the potential to create the essential conditions for optimal intergroup contact and to reduce bias and increase cooperation among construction projects workgroups. The partnering parties have different goals, example; the service provider (contractor) on the one hand has profit as a goal, and the owner, on the other hand, has the goal to minimise the costs of the project.

Thus, there is no congruence of goals and mission between the two parties. Problems in project partnering in construction are lack of an adequate and precise definition of partnering; the potential conflict between commercial pressures and forms of collaboration in practice; and the inherent difficulties in attempting to change organisational cultures to support collaborative approaches. Many organisations are reluctant to change to an integrating culture (Larson & Gray, 2011).

The critical success factors for project partnering are adequate resources, support from top management, mutual trust, long-term commitment, effective communication, efficient coordination, and productive conflict resolution. The identification of the key success factors enables scarce resources of time, manpower and capital to be allocated effectively and helps to determine the prerequisite components of a partnering arrangement and contractors can use the critical success factors to handle, limit and solve identified problems in construction projects (Ahadzie, 2008). An index for project partnering performance for the construction industry was developed to measure project success and the results identified top management commitment, trust, effective communication and innovation and improvement as key performance indicators of partnering success (Yeung, 2007).

1.8.3 Risk and partnering

In modern construction projects where the involvement of a multitude of contracting parties results in very high risks, partnering based on relationship agreements and cooperative teamwork is perceived to be an effective medium for managing conflicts between diverse participants (Rahman & Kumaraswamy, 2013). Previous studies indicated that three factors critical to the success of relational partnering include the establishment of joint risk

management (RM) team to effectively manage the project risks (Rahman & Kumaraswamy, 2013) ensuring team member trust and confidence in one another's abilities (Ngami & Pienaar, 2013) and establishing open and reliable lines of communication (COMM) between team members (Cheung, 2003).

Project partnering is a variable in the research that according to the discussion above, leads to an environment conducive to problem solving and conflict resolution. Effective partnering should therefore reduce the level of risk in projects when compared with projects where the partnering concept is not effective. Partnering is recommended to reduce an adversarial approach between the parties by encouraging improved integration and cooperation (Cook & Hancher, 2011).

1.8.4 Project Management Body of Knowledge areas (PMBOK)

The questionnaire measures risk in the Project Management Knowledge areas (Burke, 2013). Ten knowledge areas are defined: Scope management, Time management, Cost management, Quality management, Human resource management, Communication management, Risk management, Procurement management, Integration management and Stakeholder management.

1.9 RESEARCH METHODOLOGY

Research methodology is the specific procedures or techniques used to identify, select, process and analyse information about a topic. In a research paper, the methodology section allows the reader to critically evaluate a study's overall validity and reliability.

1.9.1 Study area

The study area is the Department of Public Works (DPW) representing the "Owners" of projects in the Limpopo Province and the associated contractor for each project.

1.9.2 Research design

According to Welman and Kruger (2009), a research design can be defined as a plan according to which a researcher obtains research participants (subjects) and collects their information. The researcher explores the relationships between partnering and risk in a research study using quantitative and qualitative research.

This study is an investigative study to examine the relationship between partnering and risk in projects using a questionnaire. The research variables were measured quantitatively and analysed for any correlation.

1.9.3 Population of the study

The first step to ensure a representative sample is the use of a complete and correct sampling frame, which is a list of all units from which the sample is to be drawn.

The sampling frame for this research was the list of project managers of the DPW representing the "owners" of projects and the associated contractor for each project.

1.9.4 Sample and sampling methods

Probability sampling in the form of a simple random sampling method was used (Ryman & Bell, 2010:100). A list of construction project managers was obtained from the DPW. Each project manager identified the contractors used in their project. The population was defined, a representative sample was selected, and data were collected using a self-administered questionnaire containing open-ended questions. The number of employees is less than 150 according to a letter from DPW but the number of projects vary can at any point in time.

One hundred questionnaires were distributed to the respondents, contractors and project owners.

1.9.5 Data collection methods

A questionnaire containing open-ended questions to obtain the data was used.

1.9.6 Data collection procedures

Self-administered questionnaires containing open-ended questions were personally delivered to the respondent by the researcher but completed by respondents with no researcher involvement. Self-administered questionnaires ensure anonymity and privacy of the respondents, thereby encouraging more candid and honest responses. Questionnaires also help to ensure that information from different respondents is comparable (Cooper & Schindler, 2001)

The questionnaire for measurement of risk is standardised (Government of Canada, 2001) but was adapted to suit this study.

1.9.7 Data analysis methods

Data analysis for the study includes descriptive statistics and inferential statistics. The researcher used descriptive statistics to describe the basic features of the data in the study in quantitative terms and to provide simple summaries about the measures. The Statistical Package for Social Sciences (SPSS) was used to tabulate and analyse the data. Measures of association for interval data (Pearson correlation coefficient is a statistical measure of the

strength of a linear relationship between paired data). Analysis of variance was used to test for the difference in the assessment of risk and partnering between the owner and the contractor. The results from the open-ended questions will be coded to see if the coded data corroborate the findings and possibly shed more light on the relationship under study.

1.9.8 Ethical considerations

The respondents will be assured that the analysis of data based on the will be unbiased when analysed.

Participants' anonymity will be always respected. The researcher will treat the information as confidential as possible. Any individuals‟ participation in this research will be on a voluntary basis without undue influence.

The researcher will accept accountability for the research and will act in a responsible manner. Integrity will be ensured by being fair and honest.

1.10 CONCLUDING SUMMARY

Since the researcher wants to identify the differences are in the assessment of risk and partnering between project owners and contractors. Solutions such as proposing an effective risk management environment specific for Limpopo construction projects is still an outstanding area for research. Other areas for future research endeavours include Evaluation of risk management effectiveness in donor financed public projects, and A risk management model for a competitive public infrastructure delivery.

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1.11 ORGANIZATION OF THE STUDY

The study comprises five chapters.

Chapter 1: Orientation and overview of the study

This chapter serves to introduce the topic of the study. Furthermore, it indicated the problem statement of the study. This chapter also states the overall research objectives, as well as the theoretical and empirical objectives of the study.

Chapter 2: Risk management

This chapter served to provide an extensive background of risk within the South African context. This chapter addressed definitions of risks and risk types and disclosed the origin of risk, from both internal and external sources. This chapter, furthermore, outlined and

discussed the fundamental components that a risk management process contains and discussed risk management methods with examples of formal risk models.

Chapter 3: Construction industry sector in Limpopo

This chapter seeks to examine existing literature on project partnering as a strategic risk management means. It will focus on the various and different arguments provided by scholars such as Ofori-Kuragu & Ayarkw (2013); Hirschman (1958); Low & Leong (1992). It further critically discuss the findings of various empirical research on the above area.

Chapter 4: Research methodology

This chapter provided information about research methodology and data collection techniques, which included explanations of the sample size, choice of sample and the data collection process.

Chapter 5: Presentation and discussion of findings

The results and findings are presented to determine the extent of the application of informal risk management procedures amongst construction industry.

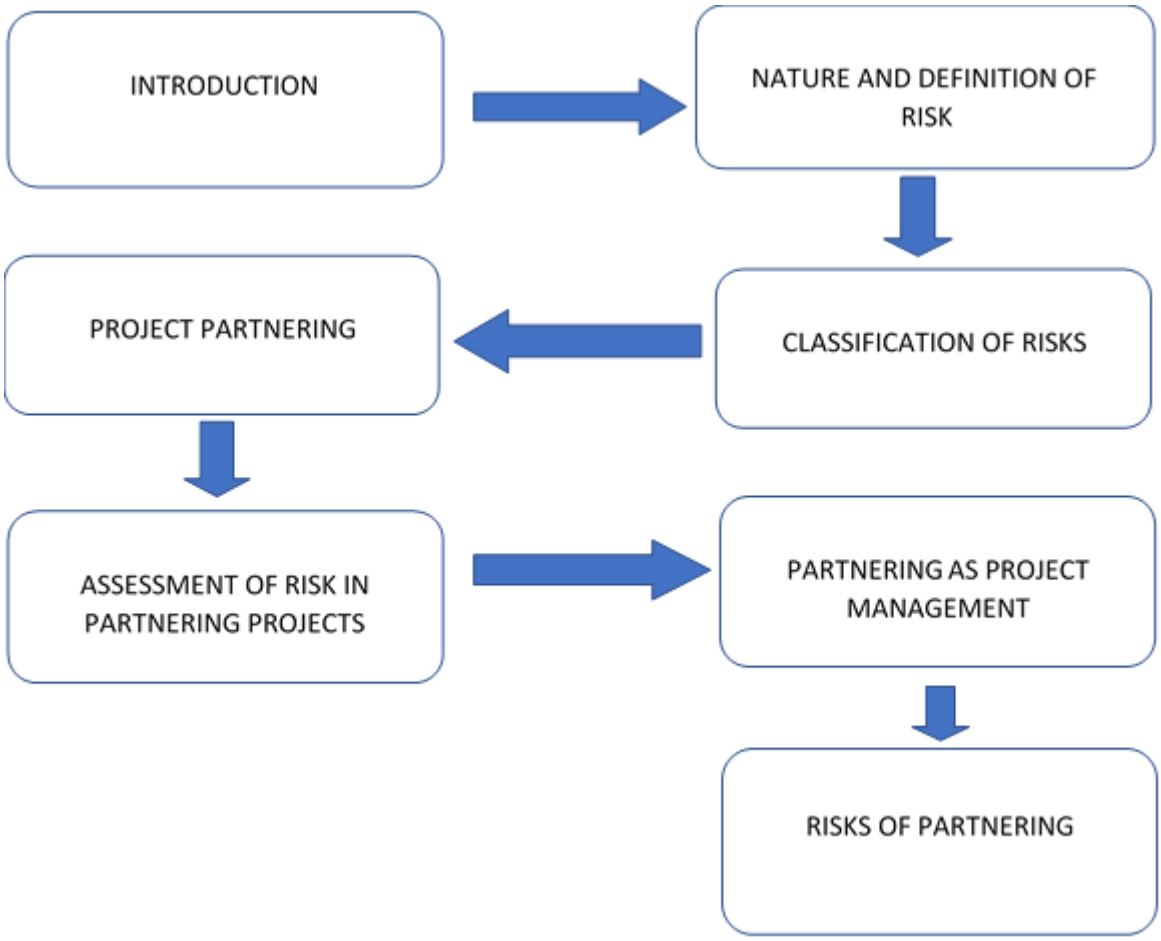
Chapter 6: Conclusion and recommendations

Based on the findings of this research, make necessary recommendations to policy and decision makers. The suggested solutions are not absolute, but the researcher hopes that they should be useful to the assessment of risk and partnering between project owners and contractors.

CHAPTER 2

RISK MANAGEMENT

2.1 STRUCTURE OF THE CHAPTER



2.2 INTRODUCTION

Risk management is a deviation from the expected value of an expected outcome. It implies the presence of uncertainty regarding the occurrence of an event and uncertainty regarding the outcome (impact) of the event. This chapter served to provide an extensive background of risk within the South African context. This chapter addressed definitions of risks and risk types and disclosed the origin of risk, from both internal and external sources. This chapter, furthermore, outlined and discussed the fundamental components that a risk management process contains and discussed risk management methods with examples of formal risk models.

2.3 CONCEPTUALISING RISK

Conceptualising risk is a of interpretations of the risk concept exit. Risk comes about by means of events or changes in the external environment and/or scenarios within which an organisation operates (Olsson, 2002); Marx & De Swardt (2014). Events and structural changes take place internally within and external from the entity (Borghesi & Gaudenzi, 2013). Risk is a subjective matter in that it relates to all actors within a system differently and individually (Chicken, 1996); Cabinet Office (2002). Risk is brought about through the inconsistency of an internal actor or systemic shift within an otherwise balanced system (Borghesi & Gaudenzi, 2013).

Risk has traditionally been linked with a negative possibility that goes along with it (Valsamakis, 2013). If the negative outcome was the only matter to consider, it would thus be a logical action to eliminate the risk altogether, however, must often be undergone to achieve the potential for some form of gain (Hopkins, 2013). Risk thus has a dual character in that it has the capacity to produce financial gains or lead to financial losses (Iso, 2002); Warwick (2003). Due to the conflicting, relative and individual nature of risk, defining risk holistically can be difficult (Borghesi & Gaudenzi, 2013).

To circumvent this complexity, risks are individually defined in practice with the definition being contextually bound to the source of the risk; the nature of the risk, or some archetype relating to the specific outcomes of a risk event or situation (Valsamakis, 2013); Marx & De Swardt (2014). Traditionally, the risk is defined as the possibility of an undesired or negative consequence of an event or scenario (Chicken, 1996) however, this definition does not fully encapsulate a functional conceptualisation of risk (Olsson, 2002). Risk is a pre-requirement that must often be undergone to create an opportunity for gain (Knief, 1991); Hopkins (2013). Application of optimum logical risk management, using this definition, would result in an economic standstill as non-action would be the most efficient risk minimising managerial action (Kaplan & Garrick, 1981); Borghesi & Gaudenzi (2013).

In response to the limitations of the traditional train of thought, the general definition of risk was modified to include the concepts of uncertainty and the expectations of applicable parties (Warwick, 2003); Marx & De Swardt (2014). Uncertainty of outcome or loss, probability of risk event, or the risk exposure as a result of an event are the defining characteristics of risk when definitions are compared (Kaplan & Garrick, 1981); Graham & Weiner (1995); Rosa (1998); Valsamakis (2013). The inclusion of uncertainty of whether expectations would be met, resulted in individual definitions for the risk being constructed for any scenario undergone, within the risk contexts of all applicable parties, allowing for new degrees of

specification of tolerance levels (Cabinet Office, 2002); Valsamakis (2013). Risk definition now includes the concept of loss aversion and the concept of the uncertainty of the possibility of variation of actual outcome from the expected outcome (Lowrance, 1976); Valsamakis (2013).

Risk can be argued to be a deviation from an expected scenario that results in a shortfall below the expectations of the applicable party, losses, or losses that are beyond the initial expectations of the applicable party (Warwick, 2003); Borghesi & Gaudenzi (2013). Risk thus exists as the uncertainty, in regard to the frequency or consequence of events that could have a negative influence on any party of relevance, in reference to the degree of deviation of actual outcome from the individually established expected outcome (Chicken, 1996); Olsson (2002); Warwick (2003); Aven & Renn (2009); Valsamakis (2013).

2.4 RISK MANAGEMENT PROCESS

Risk can be classified by its outcome or by its origin. These are discussed in the sections to follow.

2.4.1 Risk by outcome

Risks can be classified broadly into one of three major groups because of their outcomes as shown in Figure 2.1 (Hopkins, 2013). These classifications are pure risks, control risks and opportunity risks (Hopkins, 2013). Pure and control risks, once identified, usually have the capacity to be insured against (Kahane & Kroll, 1985); Valsamakis (2013).

It should, however, be noted that of the potential risks from an event, comparatively few can be insured against (Ewald, 1991). Opportunity risks differ from the former two in that they are entered into willingly as a part of doing business and are usually uninsurable (Williams, 1966). Internal risk include personnel management, such as labor shortages or poor morale and technology issues, as such out dated software. External risk include economic slowdowns, leading to lower revenue as well as political risks from trade wars hurting international sales.

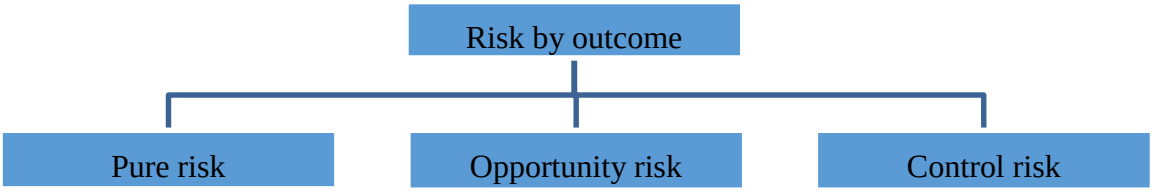


Figure 2.1: Risk by outcome (Ewald, 2000)

2.4.2 Pure risk

Pure risk is a risk that can only have a negative outcome (Hopkin, 2013). Pure risk, furthermore, can be classified as physical hazards, which are objective catalysts for exasperating risks and moral hazards that come about from the subjective, individual decisions of actors that stand in contrast to what is ideal for the organisation (Gahin, 1967; Borghesi & Gaudenzi (2013).

2.4.3 Opportunity risk

Opportunity risks, also known as speculative risks, are risks entered into to make a gain potentially (Borghesi & Gaudenzi, 2013); Hopkins (2013). Opportunity risks are the main focus of the business function of organisations (Williams, 1966).

2.4.4 Control risk

A control risk, also known as uncertainty risk, is a risk that has a large degree of uncertainty surrounding it (Borghesi & Gaudenzi, 2013); Hopkins (2013). Uncertainty in this regard can exist in regard to the source from which the risk arises or from the uncertainty of the effect of the focus, the latter being insurable (Borghesi & Gaudenzi, 2013).

2.4.5 Fundamental risk and particular risk

Fundamental risk is defined as exposure or loss that originates from: the exterior periphery of the business environment; the political realm; as a result of social interdependence; from a purely physical event such as famine; or a natural disaster (Valasamakis, 2014). The external risk environment is defined as that area of activities that is beyond the business to influence and includes political & socio-economic movements, natural disasters or so-called acts of God, reputational risk events and decisions by legal or regulatory bodies (Borghesi & Gaudenzi, 2013); Valsamakis (2014).

Despite being incapable of controlling external risk they must be considered due to the risk they carry, and measures must still be taken, and a corporate culture developed to create a buffer against losses resulting from them (Da Costa-Lewis, 2004). The main tools used in practice are some form of insurance or the retention of a capital buffer (Ewald, 1991).

A particular risk arises from events that are isolated to the individual from whom the risk event originates and that risk that is directly responsible for potential losses, such as a fire (Vayanos, 2010). The remainder of the risks falls within the internal environment, which also is described as that risk which is within the scope of the business to manage and arises from

the activities of the organisation (Abkowitz, 2008); Hopkins, 2013). Due to the origin of these risks from within the organisation, internal risks tend to be within the conceptual framework of the organisation (Chicken, 1996); Frost (2001).

Despite the difference in the degree of focus, fundamental and particular risks often are separated from each other as classification terms by nothing more than the subjective judgements of the society to whom they pertain (Chen, 2007). This subjectivity and the capacity for overlap in risk sources makes it difficult for strict classification of particular risks under this classification method across the board (Vayanos, 2010).

2.4.6 Monitoring and Controlling

Risk can be arranged into two broad categories, which are systematic and unsystematic (Valasamakis, 2013). Systematic risk deals with the risks that affect the business through market events, thus it is also called market risk and is by nature non-diversifiable and a measure of market volatility (Mills, 2001). Systematic risk is a risk that fluctuations in market prices and rates will devalue the organisation or assets held by the organisation, such as securities held by the organisation or the financial portfolio of the organisation at large (Chatterjee & Lubatkin, 1990); Reiley (2010). Correlation to the market determines the scope of the effect of systematic risk and thereby is another measure of market risk (Hamada, 1972).

Market risk can be subdivided further into a general price effect carried by the entire market and that price effect that is pertinent to anyone specific transaction undergone by the organisation (Lakonishok & Shapiro, 1986). Market risk comes about from individual assets from their positions in the market, which are exposed, that is to say, that is un-hedged (Dowd, 2002). Measures of market risk differ in regard to the context in which they appear but usually are defined as a deviation from some benchmark (Bos & Newbold, 1984); Gencay (2005). Crouhy (2014); identify four major types of market risks: commodity price risk, equity price risk, interest rate risk and currency risk, which are discussed briefly below.

2.4.7 Commodity price risk

Commodity price risk is the risk that commodity prices might fluctuate and thereby lead to losses for the organisation to whom the sale and purchase thereof are applicable (Linsmeier, 2002). The characteristics of commodities that amplify the price risk that surrounds it are the small number of commodity suppliers, inconsistent trading liquidity amongst suppliers and cost and ease of storage (Crouhy, 2014).

2.4.8 Equity price risk

Equity price risk is the level of sensitivity a portfolio or instrument carries in relation to volatility in stock market indices (Crouhy, 2014). The individual equity risk created by the characteristics of the firm can be diversified; however, the general equity price risk that comes about from market activities cannot be eliminated through diversification (Constantinides, 1978).

2.4.9 Interest rate risk

Interest rate risk is the risk of potentially negative variations in interest rates that could lead to a decrease in net interest income (Valsamakis, 2013). Interest rate risk can come about from an increase in market interest rates when the interest rate on an asset held by the organisation maintains a fixed interest rate (Hull & White, 1990).

When assets are held together in a portfolio, the complexity of interest rate risks are increased and must factor in matters of asset maturities, asset cash flows, the gap between liability- and asset-like instruments and reset dates (Hellwig, 1994). Even when maturities between assets that counterbalance each other's interest positions are present, basis risk can still come about if the positions are not perfectly correlated (Hull & White, 1990). Basis risk is a term that represents the potential for a failure in the relationship between the price of a product and the price of the price-hedging instrument used to offset it (Crouhy, 2014).

2.4.10 Currency risk

Currency risk, also known as foreign exchange risk, is the risk that a change in currency values will adversely affect the cost associated with the purchase of goods or reduce the price at which they will be sold (Greene & Serbein, 1983); Adler & Dumas (1984). Currency risk appears when a position is left imperfectly hedged or naked in regard to the assets or liabilities that are denominated in the foreign currency (Valsamakis, 2013). Currency risk can also appear as a result of business activities and not as a result of a conscious attempt to trade currency, which can result in variability in not only profits but also asset valuation (Borghesi & Gaudenzi, 2013).

Within the scope of a country, a depreciation of the domestic exchange rate against another increases the export competition advantage for the domestic country and can be achieved through quantitative easing (Chiu-Ming, 2017). Businesses adapt and adjust to price differentials given enough time (Adler & Dumas, 1984); Chiu-Ming (2017) however, fluctuations during a transaction period can lead to significant losses of returns; the creation of a competitive disadvantage; large operating losses; and significantly reduced investment

(Crouhy, 2014). Currency risk is driven primarily by international interest rate fluctuations and imperfect correlations of different currency prices (De Santis, 2003).

2.4.11 Systemic risk

Systemic risk is the risk of the collapsing of a system by means of the propagation of one market participant's economic distress, through sequential and increased financial transactions, that thereby destabilise the entire market and potentially the global economy (Rochet & Tirole, 1996); Haldane & May (2011). Systemic risk can be triggered by the perception of greater risk or institutional losses that may disrupt the entire market where assets are highly correlated (Acharya, 2009), including healthy market segments that were formerly thought to be uncorrelated (Das & Uppal, 2004). This disruption leads to panic and panic leads to margin calls across the board, which leads to liquidity seeking behaviour by institutions at a significant devaluation, which leads to a drop in asset values across the board, which in turn triggers another round of additional margin calls and asset devaluations (De Nicolo & Kwast, 2002); Billio (2012). The size and interconnectedness of economic entities add to systemic risk, not only in the capacity of these enterprises but also in regard to the time it would take to repair functional relationships between these entities (Battiston, 2012).

2.4.12 Unsystematic risk

Risks that are in the hands of the organisation, as opposed to being predetermined by the market, make up unsystematic risks (Crouhy, 2014). Unsystematic risk is the focus of management and includes the specific classifications of marketing risk, financial risk, resource management risk, environmental risk (Doherty, 1985) property and personnel risk, and personnel and production risks (Greene & Serbein, 1983). Within the managerial and corporate environment, managerial risks are further sub-categorised into incidental and inherent risks (Valsamakis, 2013).

Inherent risks include risks such as sales variability, operating leverage, resource risks, profit margin and turnover risks (Graham & Weiner, 1995). Sales variability is a measure of the degree of deviation from the mean sales over a period of time, caused by market factors affecting demand (Kaplan & Garrick, 1981). Operating leverage is a measure of the percentage change in operating earnings divided by the percentage change in sales (Aven & Renn, 2009). Resource risks are changes in the cost or availability of resources needed to produce the product (Chicken, 1996). Profit margin and turnover risk come about from a change in the business environment (Graham & Weiner, 1995). Increased levels of

competition force product margins down, resulting in reduced turnover and act as a risk to shareholder earnings (Marx & De Swardt, 2014).

Incidental risks are risks that come about from business activities and a natural result (Warwick, 2003). Incidental risks include a range of financial risks such as interest rate risks, liquidity risks, investment/ capital risks, credit risks and currency risks (Marx & De Swardt, 2014).

2.4.13 Financial risk

Financial risks are those associated with financial assets and relate to the ability to meet financial claims (Marx & De Swardt, 2014). Although commodity price risk, equity price risk, interest rate risk and foreign exchange risk, significantly affect financial risk, they are systematic and thus do not result from the actions of the organisation (Grable, 2000). Major financial risks that are within the capacity of the organisation to control include liquidity, capital and credit risks (Jorion, 2007).

Liquidity risk is the risk of operating finance shortfall (Young, 2010). Liquidity is required to meet the financial obligations of the enterprise on a short-term basis (Crouhy, 2014). Liquidity risk comes about from the size of assets and liabilities and the difference in their size and has a trading component and a funding component (Valsamakis, 2013).

Trading liquidity risk comes about from a situation in which the organisation becomes incapable of completing a transaction at the market price because there is no demand for the offer being made to the market within the market (Pastor & Stambaugh, 2003). Trading liquidity risk could result in a decreased capacity to hedge and manage market risk or meet liquidity shortfalls through asset liquidation (Glosten, 1989).

Funding liquidity risk relates to a firm's ability to procure the needed cash or cash equivalents to satisfy capital withdrawals; to meet the margin, collateral and cash, requirements of counterparties; and to roll over its debt (Hui, 2011). Funding liquidity risk is related to the urgency and size of the transaction, with faster and/or larger transactions exacerbating the losses more greatly (Brunnermeier & Pedersen, 2009). Funding liquidity risk can be managed through holding cash and cash equivalents, setting credit lines in place and monitoring buying power (Drehmann & Nikolaou, 2013).

Capital risk is the risk of degradation, devaluation or loss of an organisation's human capital and physical capital assets or investments as a result of physical, financial, and human perils to which the organisation is exposed to (Sandmo, 1969). Capital risk, within a banking

context, refers to the level of liquidity of its financial assets (Altunbas, 2007); Krebs (2003) observed that reducing human capital risk is an efficient driver of economic development.

Credit risk is the risk of deviation from the terms of a financial contract, or that a contractual party will resort to default (Young, 2010). Credit risk can be further broken down into four main types: downgrade risk, default risk, bankruptcy risk and settlement risk (Crouhy, 2014). Downgrade risk is the risk that the credit rating of the borrower or counterparty might be downgraded action by the rating agencies (BIS, 2011). The downgrade results in an increased premium for credit and might result in default (Sandmo, 1969). Default risk corresponds is the risk that applicable parties might not be capable or might refuse to meet their debt obligations (Crouhy, 2014). Bankruptcy risk is the risk of actually taking over the assets of a defaulted borrower or counterparty that were collateralised or escrowed (Altman & Saunders, 1998). Settlement risk is the risk that a transaction is not going to be completely settled and is greatest when currency value differentials over time zones and foreign exchange differentials are volatile (Crouhy, 2000). Settlement risk has also been called counterparty credit risk (Chapman, 2013)

2.4.14 Operational risk

Operational risks are risks that derive from non-financial activities within the business, are non-speculative and have no capacity to result in profits (Valasamakis, 2013); Crouhy (2014). Operational risk has been defined by BIS (2011) and supported by Young (2010) as the potential for a loss that comes about from failed or insufficient internal human resources, processes and systems or as per the result of external events that the enterprise is unable to cope with.

2.4.15 Process risk

Operational risk can be broken down into two fundamental components, namely: operational integrity, which are those matters of sufficient operational and governance controls, and service delivery, which deals with the business functions of the organisation (Frost, 2001). Process risk is the risk that those processes that must be in place for proper service delivery, are not sufficiently in place, inclusively addressing available data, or incorporating the latest proven innovations (Young, 2010).

2.4.16 Human risk

Human factor risk, also known as people risk, relates to the losses that may result from human misconduct or error (Young, 2010). Within the scope of operational risk, people risk includes fraud and dependency on key people (Valsamakis, 2013). The latter can also lead to risk

exposures on systems or processes depending on the position the individual filled (Abkowitz, 2008).

2.4.17 Systems risk

Systems risk also is referred to often as technology risk (Scandizzo, 2010). Systems risk deals with the technical aspects of the data processing and includes the risk of data corruption, programming errors, or fraudulent activity from within the business and from the external environment (Crouhy, 2014).

2.4.18 Enterprise risk management model

The enterprise risk management model is a comprehensive risk management model into which the model of partnering will be integrated. It is the culture processes and tools to manage risk (Young, 2014). It is a robust framework developed to identify, assess, and manage risk (COSO, 2010). Throughout this research enterprise risk management is treated as a strategic business discipline that supports the achievement of an organization's objectives by addressing the full spectrum of its risks and managing the combined impact of those risks as an interrelated risk portfolio.

In the views of (Meulbroek, 2002) the meaning of 'enterprise' is that to integrate risks of diverse kinds; with the help of integrated tools and techniques which alleviates the risks and further connects across on business levels as compared to traditional risk management. Moreover, Enterprise Risk Management (ERM) is defined as an integrated structure which involves managing of all business-related risks such as market risks, credit risk, economic capital, operational risk, and risk transfer so as to upgrade the value of the firm as defined by (Lam, 2000). It includes both operational and strategic risk. Risk management is an iterative process that should occur through the project life cycle and uses effective risk management techniques (Tonie, 2012).

An integrated framework for enterprise risk management was used for describing and analysing the internal control system implemented in construction projects by contractors. This framework consists of eight interrelated components. Schwalbe (2011) outlines six steps in the risk management process:

- planning;
- risk identification;
- performing qualitative risk analyses;
- performing quantitative risk analyses;
- risk response planning; and

- risk monitoring and controlling.

These steps must be undertaken throughout the PLC. The approaches in enterprise risk management may be different but the objectives are quite similar as processes often contain identical concepts (Kululanga & Kuotcha, 2010). These are derived from the way management runs construction projects and are integrated with the risk management process. These components are: Internal Environment, Risk planning, Risk identification, Risk assessment, Risk response, Control activities, Communication and information and Monitoring activities (COSO, 2010).

2.4.19 Risk identification

The construction industry is plagued by risk (Flanagan & Norman, 1993), but often this risk is not dealt with adequately, resulting in poor performance with increased cost and time delays (Thompson & Perry, 1992). The major problem is that, only known risks can be managed making risk identification vital, through risk classification. Such classification will make it easier for the risk manager to visualize risks clearly and to deal with them in logical, systematic way. It is proposed that the risks factors be categorized into three main groups: Internal, Project-specific and External.

The internal risk group represents the risks that are unique in a partnering because different organizations are involved, while project-specific risk group refers to unexpected developments during the construction period that lead to time and cost overruns or in shortfalls in performance parameters of the completed project. According to Nicholas and Steyn(2011) internal risks are market-, assumptions- and technical-related, depending on their sources or origins. Moreover, (Schieg 2006, 2007) divides endemic risks in the construction industry according to the following types: quality; personnel; costs; deadline; strategic decisions‟ risks; external; environmental; technical; scheduling; legal and contractual; financial, and management. Forbes, Smith, and Horner (2007) grouped and termed these risks using the acronym, PESTLE, that is Political, Economic, Social-cultural, Technological, Legal, and Environmental.

2.4.20 Risk planning

According to Schwalbe (2011), this step involves deciding how to approach, plan, and execute the risk management activities for the project. There are a number of factors that should be considered when designing and planning an ERM initiative. Details of the risk architecture, strategy and protocols should be recorded in a risk management policy for the parties involved. Another aspect of this area is the project management plan, which is

developed as a roadmap for the project to reach a successful end. Once created, the project plan is approved by stakeholders and/or sponsors, and then it's monitored and tracked through a change log as the project progresses. Then follows first, the review of the project scope statement and then the following: cost, schedule, and communications management plans; enterprise environmental factors; and organizational process assets (Schwalbe, 2011). The plan defines the level at which risk management will be performed and specifies ways to identify all major project risks and specifies the person responsible for managing the risks (Nicholas & Steyn, 2011); RMTG (2012).

2.4.21 Risk assessment

Risk evaluation or assessment emphasises the importance of comparing risk levels against criteria where significant risks can be prioritised (Garlick, 2007); Nicholas & Steyn (2011). Risk assessment relates to the organization's process of evaluating the impact and likelihood of events and prioritizing related risks. This is assumed to be the most difficult component of the Risk Management Process and yet the most important (Schieg, 2007); Taroun, Yang & Lowe (2011).

Popular risk assessment tools include the PERT and Monte Carlo simulation methods, Fussy Sets Theory (FST), Analytical Hierarchy Process (AHP), Probability-Impact (P-I) grids, decision support systems, and the Probability-Impact-Predictability (P-I-P) methods (Nicholas & Steyn, 2011); Shang (2005); Taroun, Yang & Lowe (2011). Shang (2005) has recommended the following risk assessment process that engages all the PMO members in Figure 2.1. This framework demonstrates how the project stakeholders should assess risks step-by-step, using the recommended tools.

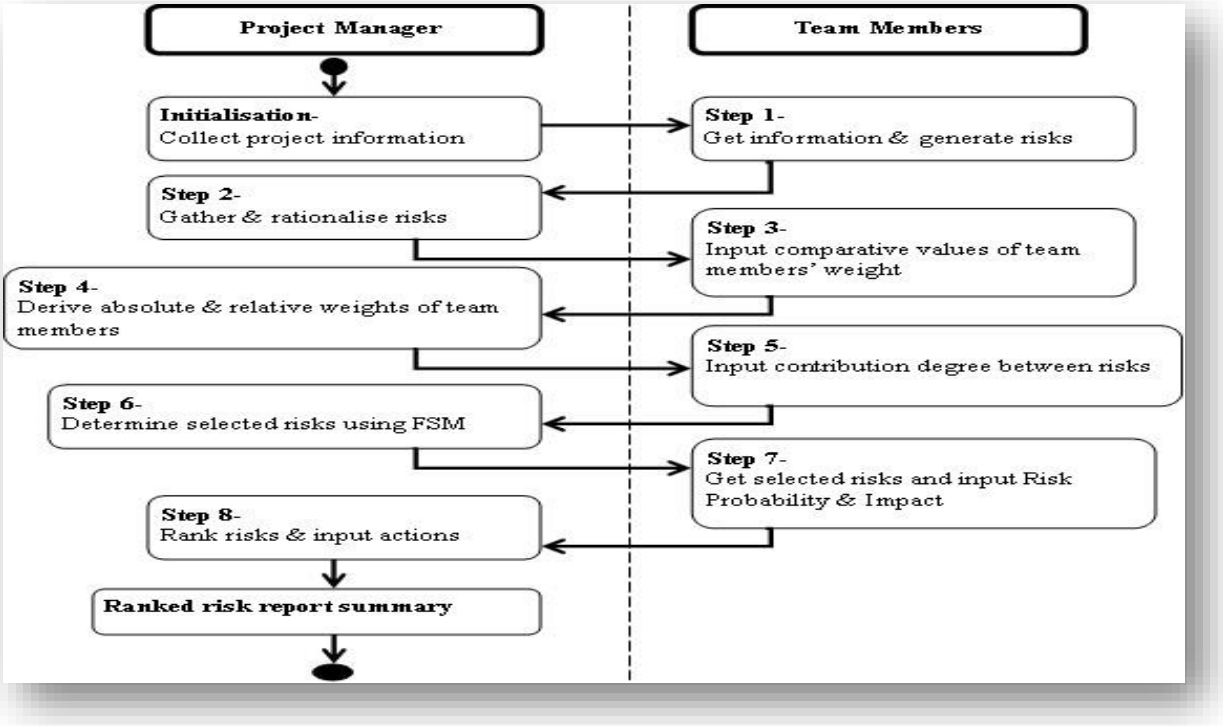


Figure 2.2: Risk assessment process

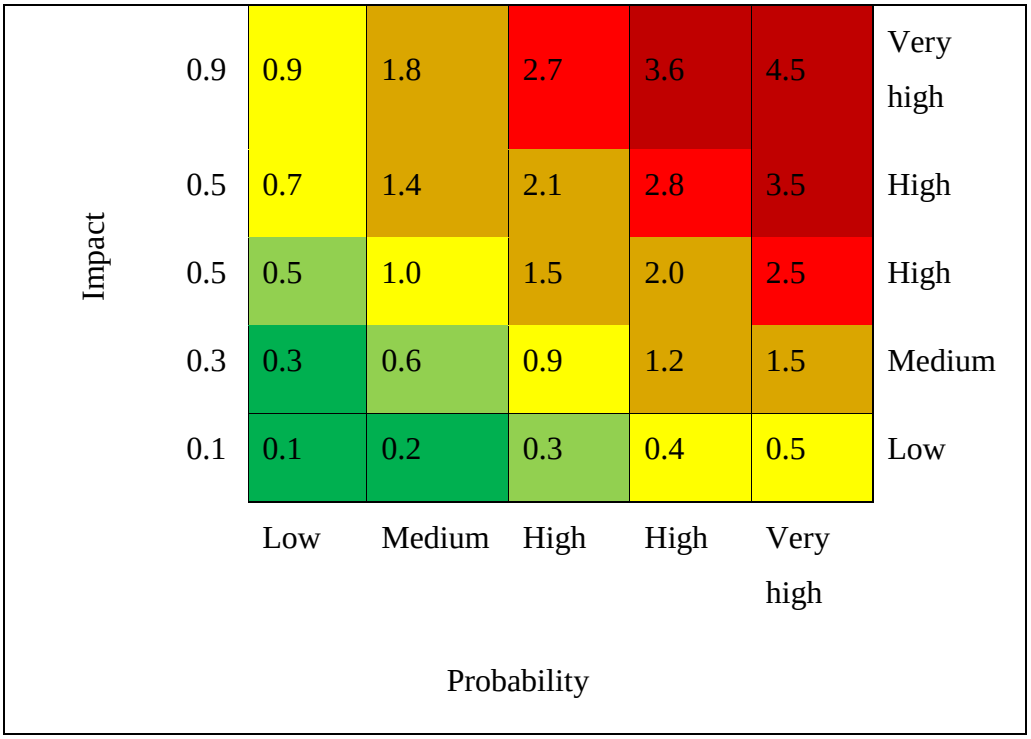
Adapted from Shang (2005)

2.4.22 Risk analysis

According to Schwalbe (2011), the risk analysis process can be performed qualitatively and quantitatively. Heagney (2012) asserts that project planning should encapsulate risk analysis within set project objectives which he identified risk through probability of occurrence and impact on the project to analyse the risk value (Schieg, 2006). Qualitative risk analysis involves a probability-impact (P-I) matrix (Table 2.3), risk consequence rating (RCR) or consequence of failure (CF) charts, Top Ten Risk Item Tracking (TTRIT), and Monte Carlo analysis, while quantitative techniques include decision trees analysis, expected monetary value (EMV), risk premium simulation, and sensitivity analysis (Schwalbe, 2011); KE (2012).

Table 2.1 below illustrates a simple 5x5 qualitative risk analysis method where P x I= Risk priority factor (RPF). This narrates as follows: The Green category where RPF/ PI=0.1 to 0.6, risks require less attention; Yellow category where PI=0.4 to 1.0, risks require comparatively less attention; the Amber category requires a good amount of attention, while the Red category requires maximum risk attention. Importantly, the P-I risk analysis model combines both qualitative and quantitative data (Nicholas & Steyn, 2011); Taroun (2011).

Table 2.1: P-I qualitative risk analysis matrix



Source: Schwalbe (2011); Nicholas and Steyn (2011)

2.4.23 Risk response

Following the identification and analysis processes, risk response planning considers how best to deal with the risk (Schwalbe, 2011). Negative risks can either be transferred, avoided, accepted, mitigated, or contingency planned for (Schwalbe, 2011); Nicholas & Steyn (2011:378-383). This can be achieved by using computer software, contingency planning, purchasing of insurance protection, identifying hierarchical risks levels, using a critical path method (CPM), or a work breakdown structure (WBS) method (Ke & Wang, 2006); Schwalbe (2011). The response strategies, according to Schwalbe (2011) include risk exploitation, risk sharing, risk enhancement, and risk acceptance which are all essential for positive risks. Collaborative strategies such as Public-Private Partnerships (PPP), Private Finance Initiative (PFI), Build-Operate-Transfer (BOT) and Build-Own-Operate-Transfer (BOOT) can be used to share and transfer risks (Tran & Molenaar,2014); Ngoma, Mundia & Kaliba (2014).

2.4.24 Risk monitoring and controlling

According to Schwalbe (2011), risk monitoring and controlling involve executing the risk management processes to respond to risk events and ensure that risk awareness is an ongoing

activity performed by the entire project team through the development of a sound project risk culture (Ke, 2012); Schwalbe (2011). This is done by producing risk register updates. Schwalbe (2011) and Tomanek and Juricek (2015) advise that tools such as the following are used when performing risk monitoring and controlling:

- variance and trend analysis.
- reserve analysis, risk audits.
- risk reassessments.
- weekly status meetings.
- sprint planning meetings.
- sprint review meetings.
- TTRIT, highlight reports; and
- Technical performance measurements.

2.4.25 Risk classification

Risk has traditionally been linked with a negative possibility that goes along with it (Valsamakis, 2013). If the negative outcome was the only matter to consider, it would thus be a logical action to eliminate the risk altogether, however, must often be undergone to achieve the potential for some form of gain (Hopkins, 2013). Risk thus has a dual character in that it has the capacity to produce financial gains or lead to financial losses (Iso, 2002); Warwick (2003). Due to the conflicting, relative and individual nature of risk, defining risk holistically can be difficult (Borghesi & Gaudenzi, 2013).

2.5 PROJECT PARTNERING

Project partnering an individual or collaborative enterprise that is carefully planned to achieve a particular aim. Various definitions for the concept of partnering can be identified by most researchers and there is no accepted definition for partnering and it generally refers to Partnering is formerly regarded as a collaborative effort in construction to improve the adversarial relationship between owners and contractors (Dexter & Larson, 2009).

Construction industries in many countries have attracted many criticisms for the existing relationships between parties due to the defects, poor collaboration, lower customer focus and lack of end user involvement (Egan, 1998). This has sparked some interest on collaborative relationships as an alternative to the traditional approach (Eriksson, Nilsson & Atkin, 2008). Nauru, and Kumaraswamy (2012) postulate that partnering has the potential to create the essential conditions for optimal intergroup contact, to reduce bias and increase cooperation among construction projects workgroups.

2.5.1 Project partnering process

Adopting the right and accurate project partnering process may be required to achieve project objectives and goals. Cheng and Li (2002) identified a customized model for the project partnering process. According to Cheng and Li (2002), the process comprises mainly three stages namely partnering formation, partnering application, partnering completion and reactivation. Also, each stage requires common and functional success factors to achieve the success. The identification of the key success factors enables scarce resources of time, manpower and capital to be allocated properly and helps to determine the prerequisite components of a partnering arrangement and contractors can use the critical success factors to handle, limit and solve identified problems in construction projects (Ahadzie, 2008).

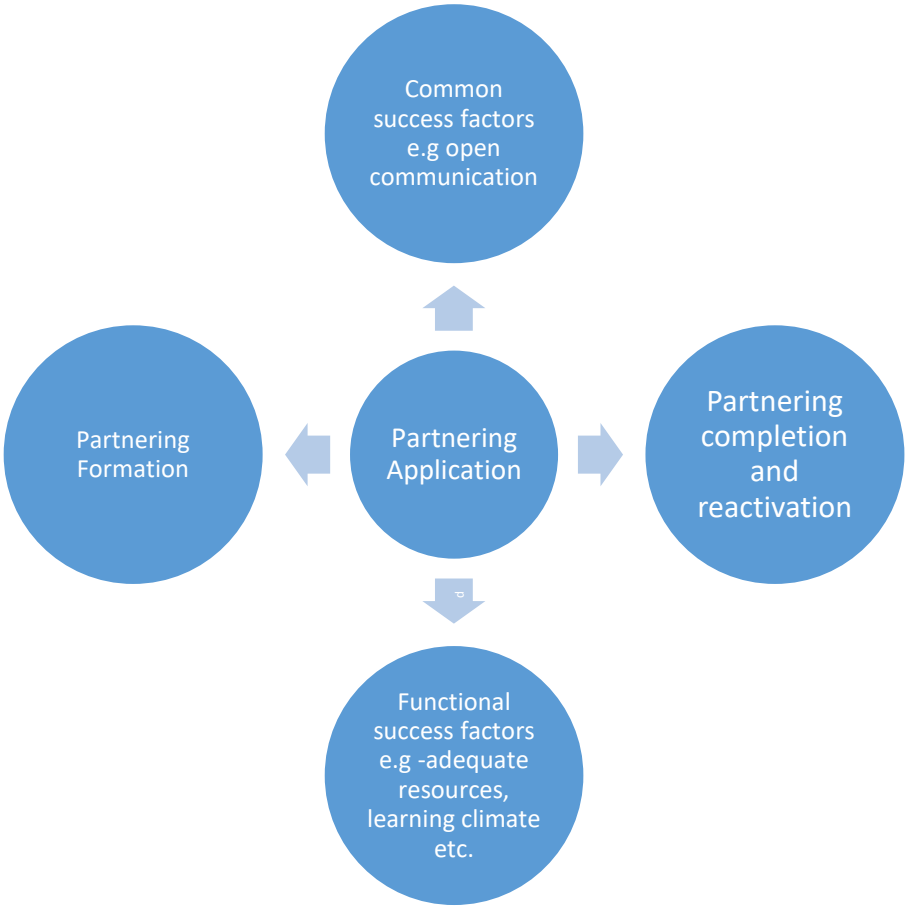


Figure 2.3: Customized model for the project partnering process

Source: Cheng & Li (2002)

Many studies have revealed different types of Critical Success Factors (CSFs) and if major parties to the project do not pay a greater attention to these CFSs, painful as well as disruptive results can become apparent (Cheng & Li, 2001). Chan (2004) identified seven main

significant factors affecting the partnering success. They are adequate resources, support from top management, mutual trust, long term commitment, effective communication, effective co-ordination and productive conflict resolution. According to the survey data analysis of Black, Akintoye and Fitzgerald (2000) the most important factors that contribute to construction project partnering success are mutual trust, effective communication, commitment from senior management, clear understanding among parties, acting consistent with objectives, dedicated team, flexibility to change and commitment to continuous improvement.

The following are critical success factors for project partnering:

adequate resources;

- support from top management;
- mutual trust;
- long-term commitment;
- effective communication;
- efficient coordination; and
- productive conflict resolution.

An index for project partnering performance for the construction industry was developed to measure project success and the results. Indicated that top management commitment, trust, effective communication and innovation and improvement key performance indicators of partnering success (Yeung, 2007).

The partnering parties have different goals, i.e., the service provider (contractor) on one hand has profit as a goal, and the owner on the other hand, has the goal to minimize the costs of the project. Thus, there is no congruence of goals and mission between the two parties. The following are the problems in project partnering in construction:

- lack of an adequate and precise definition of partnering;
- the potential conflict between commercial pressures and forms of collaboration in practice; and
- the inherent difficulties in attempting to change organizational cultures to support collaborative approaches.

Many organizations are reluctant to change to an integrating culture (Larson & Gray, 2011). The partnering parties have different goals, i.e., the service provider (contractor) on one hand has profit as a goal, and the owner on the other hand, has the goal to minimize the costs of the project. Thus, there is not congruence of goals and mission between the two parties.

The partnering parties have different goals, i.e., the service provider (contractor) on one hand has profit as a goal, and the owner on the other hand, has the goal to minimize the costs of the project. An unambiguous understanding as well as the knowledge regarding the project partnering concept is vital to achieve success in partnering relationships between parties involved in the project Chan, Chan & Ho (2003). Thus, there is not congruence of goals and mission between the two parties. According to Larson and Drexler (1997), regardless of the importance of direct open communication in partnering, some parties do not trust other party and not willing to communicate and share important information. Sanders and Moore (2012) mentioned that problems do not disappear automatically just by writing the partnering agreement. Conflicts and disputes among the parties involved in the projects are still possible.

The following are the problems in project partnering in construction:

- lack of an adequate and precise definition of partnering;
- the potential conflict between commercial pressures and forms of collaboration in practice; and
- the inherent difficulties in attempting to change organizational cultures to support collaborative approaches.

Many organizations are reluctant to change to an integrating culture (Larson & Gray, 2011). According to Hellard (1995), it is basically difficult to change the established culture within an organization. Projects with partnering will have different cultural features as many organizations are generally reluctant to change into a more integrating culture. The partnering parties have different goals, i.e., the service provider (contractor) on one hand has profit as a goal, and the owner on the other hand, has the goal to minimize the costs of the project. Thus, there is not congruence of goals and mission between the two parties.

One of the basic objectives of project partnering is to encourage the parties involved in the project to shift from traditional adversarial attitude to more cooperative as well as team-based approach to prevent issues (Loraine, 1994). According to the Sanders and Moore (2012), all involved parties in the project should need to have total commitment towards the project partnering process. Whereas it is visible some uneven level of commitment in practice mainly due to different goals among parties in the project.

2.5.2 Partnering advantages

Partnering can result in a significantly higher level of quality on a project and can significantly increase the probability of timely and on-budget completion of the project and can reduce the risk of claims and litigation.

2.5.2.1 Benefits to the owner

Partnering can help owners have greater control of schedule and cost through close communication and regular evaluation of project progress. This is due to higher quality through focusing on mutual goals by team members who are not side-tracked into adversarial relationships. This has a tendency of resulting in higher profit potential for all the parties involved resulting in a more efficient deliver process. There is potential for a totally claim free project which can be achieved through partnering as lower administration costs can be achieved by the avoidance of case building and use of outside counsel. Innovation can emerge through open communication and trust particularly in the area of value engineering and constructability reviews (National Research Council, 1994).

2.5.2.2 Benefits to the construction manager and general contractor

Both parties can help reduce risk of delays and cost overruns with early and active involvement in issue resolution. There is reduced exposure to claims litigation through early low-level project resolution of problem issues (National Research Council, 1994). Increased productivity by the elimination of adversarial relationships and case building. Thus, in general, greater profit potential.

2.5.2.3 Benefits to architect/engineering consultants

Partnering creates reduced exposure to liability for document deficiencies through early review. Also, there is cooperative effort to resolve problems early, to reduce exposure to claims and litigation resulting in reduced administrative costs and increased profit potential (National Research Council, 1994).

2.5.2.4 Benefits to subcontractors and suppliers

According to National Research Council (1994), partnering improves cash flow due to elimination of, or reduction in, disputes resulting in withheld payments. There is greater involvement in the decision-making process as an active team member in the project. There is reduced exposure to, or elimination of, claims and litigation through early project dispute resolution. And finally, increased profit potential through a “win-win” attitude.

2.5.2.5 Assessment of risk in partnering projects

Risk analysis dates back to 3 200 BC. Within the construction industry it was during the early 1960s when it became evident. Along the way, well established techniques were developed in the 1980s and 1990s. A few studies carried out in the 1990s paved the way with further research direction of risk analysis (Edwards & Bowen, 1998). During the early 20th century, Tah and Can (2001) used fuzzy risk analysis model as a tool to assess the construction project

risk in London. Thomas, Kalidindi, and Ananthanarayanan (2003) used BOT road projects to analyse the risk perceptions and managements in India with the main goal of evaluating the existing literature, using unstructured interviews and discussions with stakeholders of the project and questionnaire survey for their research methodology. They also used regression analysis. San Santoso, Ogunlana and Minato (2003) also used the same methodology to assess the risks associated with high rise building construction in Jakarta, analysing it through the mean value, correlation matrix and Bartlett's test. Hillson (2003) has used Risk Breakdown Structure (RBS) to manage risks in United Kingdom but there is no significant finding from the research.

Different authors have attempted to identify the risk factors and the corresponding impacts on the projects through statistical analysis for data obtained from questionnaires, interviews and literature reviews and tried to conceptualize the existing knowledges of risks to the specific country (Zou & Zhang, 2009); Zou (2006).

In the nature of modern construction projects where the involvement of a multitude of contracting parties results in very high risks, partnering based on relationship agreements and cooperative teamwork is perceived to be an effective medium for managing conflicts between diverse participants (Rahman & Kumaraswamy, 2013). Previous studies indicated that three factors critical to the success of relational partnering include the establishment of a joint risk management (RM) team to effectively manage the project risks (Rahman & Kumaraswamy, 2013), ensuring team member trust and confidence in one another's abilities (Ngami & Pienaar, 2013) and establishing open and reliable lines of communication (COMM) between team members (Cheung, 2003). Project partnering is a variable in the research that according to the discussion above leads to an environment conducive to problem solving and conflict resolution. Effective partnering should therefore reduce the level of risk in projects when compared with projects where partnering concept is not effective. Partnering is recommended to reduce an adversarial approach between the parties by encouraging better integration and cooperation (Cook & Hancher, 2011).

2.6 PARTNERING AS PROJECT MANAGEMENT

Project partnering may be a soulation to the traditional adversarial relationship between owner and contrctor. What holds a project together is project integration management. The project integration area includes the directing and managing of the project work, which is the production of its deliverables. This process is monitored, analysed and reported on to identify and control any changes or problems that might occur (Burke, 2013).

Project Scope management relates to the work of the project. A scope plan will be well articulated within a scope statement that will be comprehensive to reduce major project risk. Project time management is, no surprise, time consuming. This is due to the fact that the project is categorized into tasks, which are scheduled with start dates and deadlines, as well as budgets for each task. This is vital considering that things are constantly changing over the phases of any project, which means revising these things often.

Cost management area involves the project budget, which means having good estimating tools to make sure that the funds cover the extent of the project and are being monitored regularly to keep the contractual parties involved informed. Project cost management includes the process required to ensure that the project is completed within the approved budget. It consists of resource planning, cost estimating, cost budgeting, cash flow and cost control (Burke & Barron, 2007).

Quality management is part of the overall project management plan, though it can be a standalone document if it contains the quality specifications for the product or service. Project quality management should include the processes required to ensure that the project will satisfy the needs for which it was undertaken. These consists of determining the required condition, quality planning, quality assurance, quality control and continuous improvement (Burke & Barron, 2007). A project can come in on time and within budget, but if the quality is not up to the standard set, then the project is a failure. Thus, to control quality, the deliverables must be inspected to make sure that those standards outlined in the quality management plan are being met.

A human resource management plan will identify their roles and their requirements for those positions, as well as how they fit in the overall project structure. According to (Burke , 2014) Human resource management includes the process required to make the most effective use of the people involved with the project and consists of organization planning, staff acquisition and team development. The team needs development, possibly training and other things that will make them viable for the project. Communications inform the team and stakeholders, therefore the need to plan communications management is a critical step in any project. Risk management plans will identify how the risks will be itemized, categorized and prioritized. Project risk management also includes responding to project risk. Thus, it consists of risk identification, risk quantification and impact, response development and risk control (Burke & Barron, 2007).

Forbes, Smith and Horner (2007) have discovered that risk practitioners are opting for simple risk management methods rather than more complex and effective ones. According to (Shang,

2005) project members mostly concentrate on getting the job done and tend to avoid risk management (RM) procedures. Meanwhile (Hillson, 2012) asserts that risk culture as an important dimension of risk leadership is often overlooked, even though it moulds an effective risk management (RM) practice throughout the project life cycle PLC. Ke (2012); Forbes (2007) report that a full PLC constitutes the following stages:

- conception/feasibility;
- planning and design;
- execution/construction;
- termination/commissioning;
- operation; and
- decommissioning.

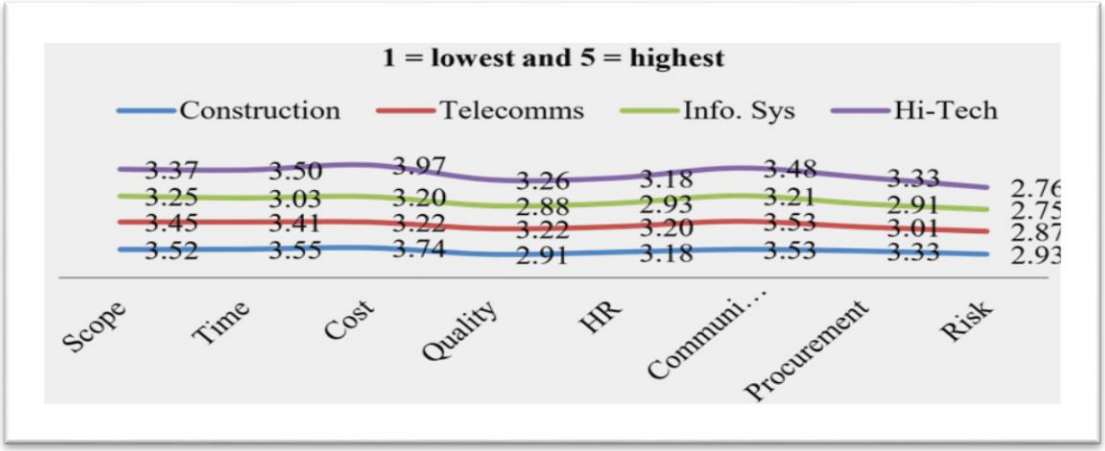


Figure 2.4: Project management maturity by industry group across Project Management Knowledge Areas (PMKAs)

Adapted from Schwalbe (2011)

2.7 PARTNERING RISKS

Partnering risks it is becoming increasingly clear that partnering is not low-cost, quick fix or risk –free option. According to (Nicholas and Steyn, 2011) technical project managers are used to working with evidences and tend to avoid the likelihood of risks because they find them too complex to deal with. Schwalbe (2011) identifies risk management as a commonly overlooked element of Project Management. Thus, managing risks requires a dedicated team. In the nature of modern construction projects where the involvement of a multitude of contracting parties results in very high risks, partnering based on relationship agreements and cooperative teamwork is perceived to be an effective medium for managing conflicts between

diverse participants (Rahman & Kumaraswamy, 2013). Previous studies indicated that three factors critical to the success of relational partnering include the establishment of a joint risk management (RM) team to effectively manage the project risks (Rahman and Kumaraswamy, 2013), ensuring team member trust and confidence in one another's abilities (Ngami & Pienaar, 2013) and establishing open and reliable COMM between team members (Cheung, 2003).

Project partnering is a variable in the research that according to the discussion above leads to an environment conducive to problem solving and conflict resolution. Effective partnering should therefore reduce the level of risk in projects when compared with projects where partnering concept is not effective. Partnering is recommended to reduce an adversarial approach between the parties by encouraging better integration and cooperation (Cook & Hancher, 2011). According to Shang (2005), project members mostly concentrate on getting the job done and tend to avoid Risk Management procedures. Meanwhile (Hillson,2012) asserts that risk culture as an important dimension of risk leadership is often overlooked, even though it moulds an effective risk management practice throughout the project life cycle.

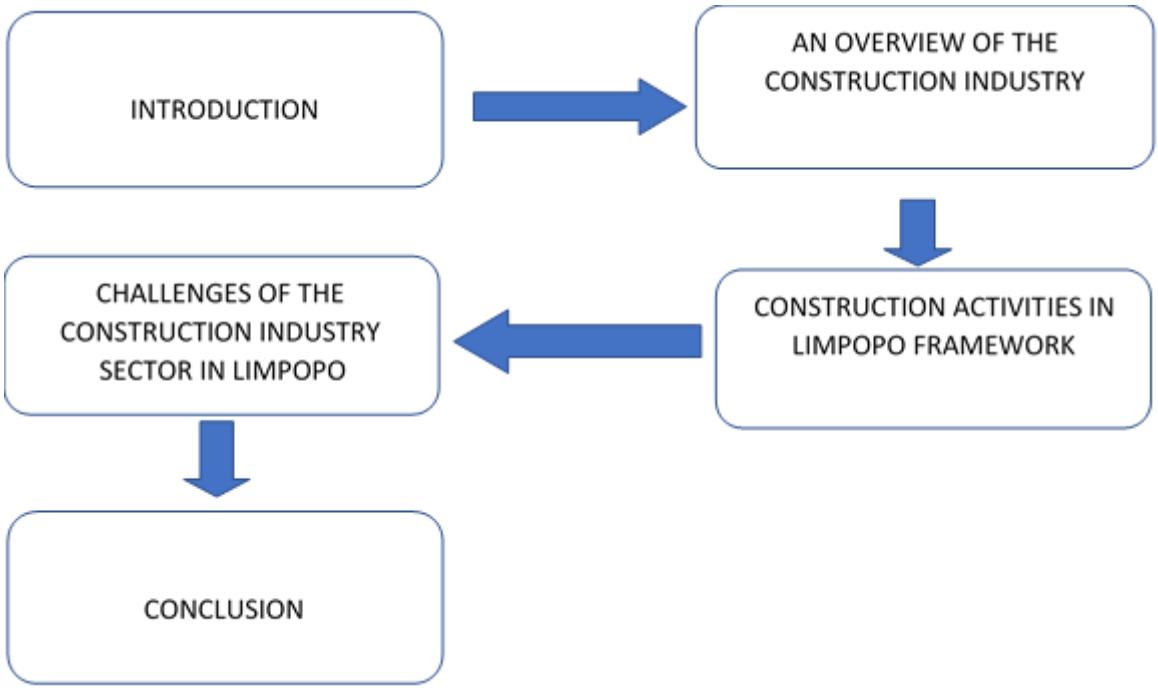
2.8 CONCLUDING SUMMARY

Since the researcher wants to identify the differences are in the assessment of risk and partnering between project owners and contractors. Solutions such as proposing an effective risk management environment specific for Limpopo construction projects is still an outstanding area for research. Other areas for future research endeavours include Evaluation of risk management effectiveness in donor financed public projects, and A risk management model for a competitive public infrastructure delivery.

CHAPTER 3

CONSTRUCTION INDUSTRY IN LIMPOPO

3.1 STRUCTURE OF THE CHAPTER



3.2 INTRODUCTION

This chapter seeks to examine existing literature on project partnering as a strategic risk management means. It focuses on the various arguments provided by scholars such as Ofori-Kuragu and Ayarkwa (2013), Hirschman (1958) and Low & Leong (1992). It will further critically discuss findings of different empirical research on the above area.

3.3 AN OVERVIEW OF THE CONSTRUCTION INDUSTRY

The construction industry is a distinct sector of the economy, which makes its direct contribution to economic growth like all the other sectors such as agriculture, manufacturing and services. Construction is an important sector that contributes greatly to the economic growth of any nation. This is an investment-led sector where government shows high interest to develop infrastructure related to health, transport as well as education sector. For prosperity of any nation, the construction industry is quintessential. It takes three roles as shown in Figure 3.1 below.

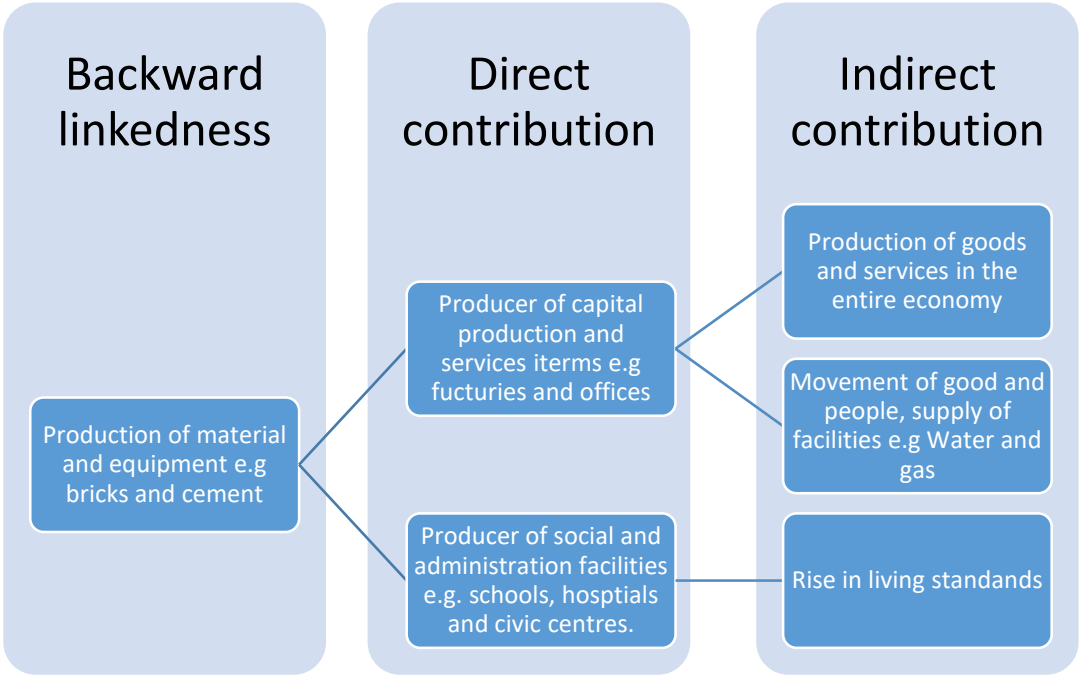


Figure 3.1: Contribution of construction development

Source: Ofori (2011)

The construction industry also has potential for generating activity and employment in other sectors of the economy such as manufacturing, transport, commerce and financial services owing to its interlinkages to other sectors. The contribution of construction industry in the aggregate economy of a country has been addressed by a number of researchers and valuable literature available on the linkage between construction sector and other sectors of the economy. Hirschman (1958) first defined the concept of 'linkage' in his work The Strategy of Economic Development. He emphasized the significance of 'unbalanced' growth among supporting sectors of the economy as opposed to a balanced development of all interrelated economic activities (Lean, 2001). Park (1989) has confirmed that the construction industry generates one of the highest multiplier effects through its extensive backward and forward linkages with other sectors of the economy.

A study by Turin (1973) of all major countries in the 1960s showed that construction accounted for between 3 and 8 per cent of gross domestic product and between 2 and 10 per cent of total national employment. Capital formation in construction was over half of gross fixed capital formation. The construction industry purchased over half of its input requirements from other sectors such as manufacturing. Edmonds and Miles (1984) studied 116 countries for the period 1974 to 1979 and found figures similar to those of (Turin 1973).

Similar relationships were again found by Low and Leong (1992) who studied the role of construction in the economies of around 180 countries and territories between 1970 and 1984.

Like earlier studies, Low and Leong (1992) found major differences between countries at different levels of development. Countries with a high GDP per capita had higher per capita value added in construction, as well as per capita gross output in construction.

In countries with GDP per capita of between US$4,000 and US$14,000, value added in construction was an average 2–14% of GDP; whereas for those with GDP per capita of below US$2,000 the range was 2–8%. Employment in construction was between 15 and 40 persons per thousand in the population in countries with GDP per capita of over US$4,000, and less than 15 persons per thousand for those with a per capita GDP of less than US$4,000. In Limpopo province, small contractors undertake the smaller and simpler construction projects, invariably using labour-intensive techniques. The International Labour Organization (ILO) observes that small-scale contractors are more liable to choose employment-intensive solutions than large contractors.

Their findings show that small contractors are able to generate income and employment with relatively little capital per job (Miles & Ward 1991). Ways must be found to take advantage of the special features of construction which offer unique opportunities. First, the construction industry should effectively play its role in the economy by realizing its potential to create jobs in all parts of the country as well as stimulating business activities in other sectors of the economy. These are the only firms willing and able to undertake the small, scattered projects, especially in rural areas, which are among the key components of development, and which are required to satisfy the basic needs of the people such as housing, health facilities, sanitation and geographical mobility.

Watermeyer and other (1994) estimated the following average costs (of overall operations) to generate one man-hour of employment in South Africa (US$1 = R3.50). The figures point out that civil engineering using conventional methods, labour-based civil engineering (mostly by small contractors).

3.3.1 Challenges of the construction industry

Most challenges emanate from neglect or ignorance of the need for improving the capacity, capability and performance of the construction industries in developing countries to equip and enable them to play their due role in the long-term progress of the countries.

3.3.1.1 Globalization

Globalization is a trend which has occupied the headlines of major popular publications for several decades. There are sharply different arguments on the merits and otherwise of the process of globalization from the perspective of the developing countries. Reviewing developments in the construction industry in several Asian countries in the 1990s, Raftery (1998) identified three trends that is a greater extent of private-sector participation in major infrastructure projects, increasing vertical integration in the packaging of construction projects which are growing larger; and increased foreign participation in the construction industries of most of the countries, almost all of which are developing.

Table 3.1: Merits of globalization in construction industry sector

Advantages	**Disadvantages**
Involvement of international finance makes possible the implementation of several projects, such as those of major infrastructure.	Local construction firms have no funds or expertise to participate in the sponsorship of privatized projects.
Direct foreign investment in projects leads to increase in construction demand, creating work opportunities for local firms.	Local construction companies lack the technical and managerial capability to undertake most of the foreign-funded projects.
Competition among foreign firms lowers the costs of projects to developing countries.	It is possible that local firms will be deprived of the opportunity to grow (Hillebrandt 1999).
Presence of large numbers of international firms offers scope for technology transfer and the development of local firms and upgrading of the industry. The large number of such firms also means that technology transfer can be a tool for competition.	Foreign construction firms may pay lip service to technology transfer (Carillo 1994) or take measures to avoid it. Moreover, local companies may not be in a position to benefit from technology transfer, or to subsequently utilize the acquired expertise.

Source: Ofori (1988)

Ofori (1988) noted that the absence of accurate and detailed information on the construction industries in developing countries constitutes an obstacle to the assessment of their strengths and weaknesses to provide a basis for developing programmes for their improvement. His research considered a scheme for the collection, processing and storage of construction information on a national basis. The proposed central database includes data on enterprises, data on projects and information on construction resources and building stock. Including performance data such as those on safety, cost and quality would also be useful. He proposed a solution through the establishment such a central database would not be easy, but it was suggested that countries that are able to set one up should do so.

3.3.1.2 Culture

Culture has become an important area of study in business organizations (see, for example, Hofstede (1980). It has been found that every organization has a culture which is determined by its history, size, corporate goals and objectives, technology of production, market, and operating environment (Handy, 1985). In construction, where several organizations temporarily interact on each project, cultural issues are constantly to the fore (Barthorpe, 1999). Thus, the ability to manage cultural issues, especially in multi-cultural situations as are encountered on large construction projects, is a determinant of project and corporate success. The project procurement and administrative arrangements currently in use in developing countries have been inherited from Western countries which have a different history, culture, collective experience and breadth of construction expertise.

This has been the norm and the arrangements determine the documentation, procedures and practices in the industry, and specify the roles of the participants and the relationships among them, and hence the networks of power and authority. However there has been a shift in the way the arrangements new approach. Latham (1994) advocated the building of trust and a spirit of partnering in an industry characterized by mistrust, rivalries and adversarial relationships. Rwelamila (2000) showed that the failure to consider and incorporate cultural traits in the procurement systems of construction project adopted in Southern Africa is a major contributor to the generally poor performance on projects. Studies in other countries might reach similar conclusions.

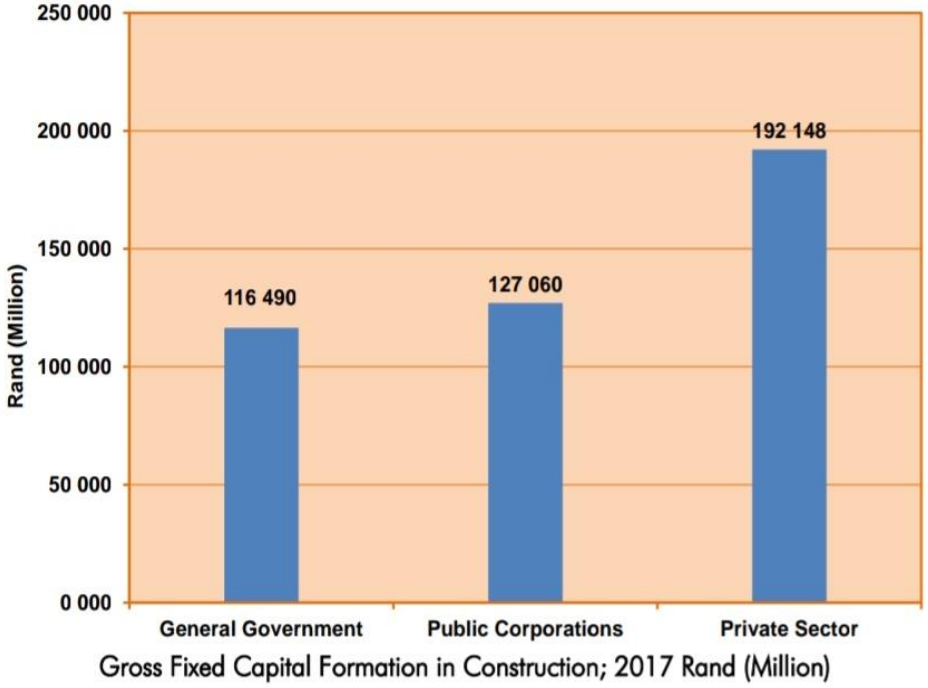
Sukhoo (2004) emphasized that project management practices in developing African countries is at infancy which is partially due to shortage of skilled staff, difficult economic and social conditions, weak political institutions, deeply-rooted cultural and religious beliefs. Olateju (2011) reckoned obstacles facing the implementation of project management in

public agencies in developing countries as lack of project management knowledge, change of authority, lack of leadership commitment, bribery and corruption, low level of professional training in Project Management, and rigid organizational structure. Nwachukwu and Emoh (2011) evaluated constraints facing project management implementation such as inadequate communication, undefined project mission, lack of management support, lack of project scheduled plan, non-involvement of clients, poor personnel selection, low technical know-how, poor monitoring and feedback system and poor conflict management.

According to El Asmar, Hanna & Loh (2013), the quality of service delivery by emerging contractors in the construction industry is often poor, and that start-up businesses in the construction industry often struggle to compete with well-established contractors. In developing countries, such as Nigeria, the constraints are peculiar to each society in terms of its economic, political and administrative system. The study conducted by Hatmoko and Scott (2010) has shown that supply chains in developing countries are often characterized by lack of respect for the fundamental principles of good governance, accountability and transparency, and that emerging contractors often struggle to secure contracts. El Asmar (2013) the quality of service delivery by emerging contractors in the construction industry is often poor, and that start-up businesses in the construction industry often struggle to compete with well-established contractors.

3.3.2 Construction industry sector in South Africa

The construction sector plays a significant role in terms of its contribution to capital formation, from 2005 to 2017, the construction sector's average contribution to gross fixed capital formation was 43%, this is in line with a number of studies which have confirmed that approximately half of the investment in gross fixed capital formation in developing countries is done by the construction sector (SARB, 2018). analysis of Gross Fixed Capital Formation (GFCF) in current prices (example, not adjusted for inflation) for the year 2017 amounted to around R436 billion and is shown below.



A more detailed breakdown is given below:

	General Government	Public Corporations	Private Sector	Total
Construction	82 238	123 964	65 267	271 469
Non-Residential	32 613	3 038	43 675	79 326
Residential	1 639	58	83 206	84 903
Total	**116 490**	**127 060**	**192 148**	**435 698**

Figure 3.2: Gross fixed capital formation in Construction

Source: SARB (2018)

The recent international boom in the construction industry has required that certain steps be taken to ensure projects are successfully delivered, to meet the projects objectives with respect to time, quality, and cost. There are an increasing number of risks that threaten the existence of many corporations and impend the stability of countries that approach these projects unprepared (Miller & Lessard, 2000). This due to the increase in scope, complexity and technology on global construction projects. This raises the importance of risk management practices such as partnering. However, Chihuri and Pretorius (2011) maintain that the lack of risk management implementation in corporations is not a blanket notion that can be applied unanimously, as some organizations embrace the principles of project risk management. Most of construction project failures lies in the inability to apply the principles throughout the project life cycle.

There is a negative perception towards risk management practices, as partners involved seem not to see the benefits of a structured project risk management methodology; as many respondents of their research are not clear as to how risk management could contribute to the overall success of projects in South Africa.

According to the PIC (2012), 65% of mega projects in South Africa have failed to meet their project objectives. A few South African projects that are reflective of this data are the Transnet multipurpose product pipeline, the Medupi Power Station and the Gautrain project (Chihuri & Pretorius, 2011). The Transnet new multipurpose product pipeline (NMPP) originally budgeted at R12.7 billion had a final cost of R23.4 billion and was three years behind schedule. In the case of the Medupi Power Station there were huge cost escalations linked to project scope definition and specifications. Resulting in a project that ended up being R56 billion rand more than the initial estimate (Donnelly, 2012). The Gautrain project was completed two years after schedule and had a cost overrun of R14 billion. According to a report published by the PIC (2012) all of these projects have succumbed to numerous unforeseen risks.

3.4 CONSTRUCTION ACTIVITIES IN LIMPOPO

A provincial overview of the construction industry shows that construction output/value added is driven by the following provinces; Eastern Cape, Gauteng, KwaZulu Natal and Western Cape. Construction activity is concentrated in the urban provinces. In 2016 these four provinces collectively accounted for around 79% of construction output. Their share of construction value added is shown below.

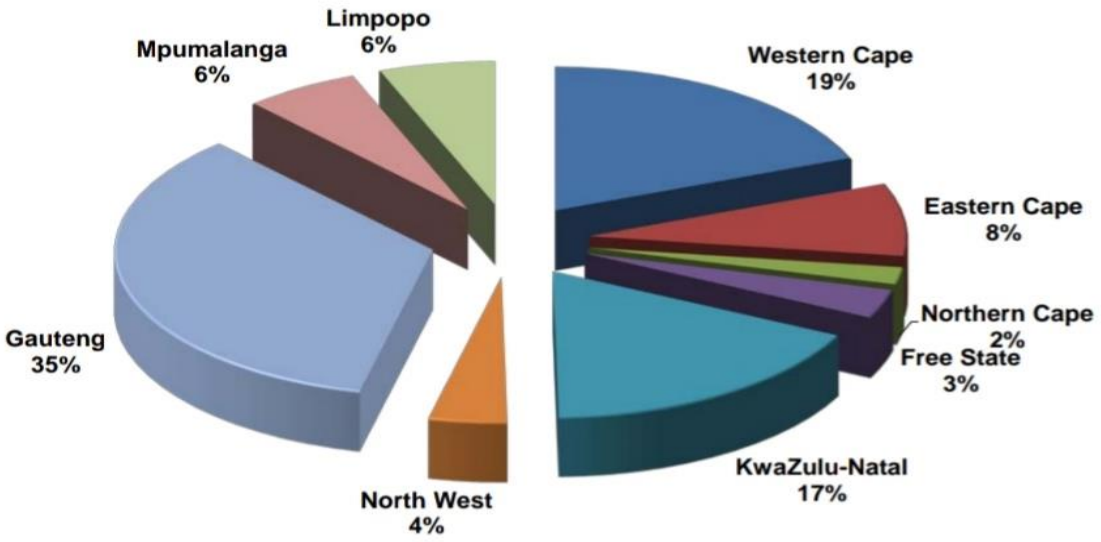


Figure 3.3: Construction output

Source: Construction Monitor (2013)

Annual reports issued by the Limpopo Provincial Department of Public Works (2015), the Limpopo Provincial Department of Trade and Industry (2014), the Limpopo Provincial Economic Development Enterprise (2015) and the South African Construction Industry Development Board (CIDB 2015) show that construction companies operated by emerging contractors in Limpopo Province are not competing favourably with well-established construction companies due to shortage of capacity, engineering-related skills, entrepreneurial skills and finance.

Annual reports issued by the Limpopo Provincial Department of Public Works (2015) show that newly established project in the construction industry of Limpopo Province are characterized by lack of technical skills in construction engineering, lack of finance and lack of basic entrepreneurial skills that are essential for networking and attracting clients. The reason can be explained by a report issued by the Limpopo Provincial Economic Development Enterprise (2015) indicates that nearly half of all start-up Small in Limpopo Province fail before operating for three years or more due to shortage of mentoring, shortage of entrepreneurial skills, inability to network with potential clients, and lack of access to finance.

The report goes on to proclaim that not enough assistance is provided to newly established businesses in all sectors of the economy. The CIDB was established in Limpopo Province by the South African National and Provincial Departments of Public Works in 2010 to provide technical and administrative support to emerging contractors. The CIDB has so far provided support to 11,874 contractors in areas related to contractor registration, technical advice and administrative support. Since 2010, the CIDB in Limpopo Province has aided 11,874 contractors out of which 10, 975 (92.43%) were newly established contractors.

3.5 CHALLENGES OF THE CONSTRUCTION INDUSTRY SECTOR IN LIMPOPO

The growth of any economy is measured by the rate of physical infrastructure developments such as roads, bridges, harbours and buildings. Since 1994, various Contractor Development Programmes (CDPs) have been used by the Limpopo Provincial Government as a vehicle for contractors in Limpopo Province. The primary focus of such programs has been to enable new entrants to acquire labour-intensive construction techniques. Regardless of the efforts the sector still faces problems discussed below.

PricewaterhouseCoopers (PWC 2013) strongly emphasizes that the implementation of project management processes is imperative in the management of construction risk. In other words, it is necessary to prevent poor execution of contracts. Furthermore, failure to implement project management process result in margin erosion, losses and an increase in the risk of poor-quality control on site. The subsequent effect thereof is that construction companies have to rework on the projects, incur extra costs and delayed delivering the required work.

3.5.1 Shortage of funding for low-level construction projects

Contractor development programmes are provided by the district municipality through funding from the National Department of Public Works programme, while have any ownership or leverage on the developmental programmes. In the district municipality, for contractors to be selected into the programme, a registered certificate is a precondition, and the process requires contractors to go through a learnership for about three years (Worku, 2017). As a result of limited funding, the programme was being implemented at a very limited scale with only three contractors finishing the programme in 2010.

There is increase in the cost of building materials, considering materials represent as much as 60% of aggregate venture costs (Bourne, 1981); Haskell (2004). When the accessibility of funds has been minimized, construction projects are the ones that suffer the most (Luus, 2003). South Africa creates its own key materials and depends on imported hardware. Hence, increments in material expenses inside the business are an outcome for concern. This shortage of funding proves to be a huge constraint provided materials have become costly. The CIDB (2007) investigate the Building and Construction Sector in South Africa takes note of that the costs of unpredictable building materials, for example, steel, bond, sand, copper, timber, polyvinyl chloride (PVC) channels, bitumen and stonework expanded by up to 100% between October 2000 and 2006. The unpredict ableness of the cost of building materials can be explained by globalization. Lewis (2007) underscores the impact of globalisation on the development of enterprises that are as yet creating or engaging in worldwide trading to broaden financial underdevelopment. In this manner representing a test to the improvement, and the development of construction businesses globally.

According to Worku (2017), there was an acute shortage of low-level construction projects that could be handled by emerging contractors due to lack of finance in the Province of Limpopo. Local municipalities in the province were generally poor with regards to funds allocation for low level construction projects. As a result, emerging contractors are competing with well-established firms for large construction projects. As a result of there is lack of commitment displayed by emerging contractors.

3.5.2 Backlog in infrastructural projects

There are exceptionally large inherited backlogs for infrastructure development, which are reflected by technical directors from both local and district municipalities. Ultimately, there is an urgent need to mobilize additional funds to address this deficit. Josie (2008) indicated that increasing infrastructure backlogs was an indication that current methods were not adequate for municipalities to deliver service.

District municipalities were found to be more dependent on national government for funding while local municipalities which participated were more dependent on their own income, equitable share and Municipal Infrastructure Grant (MIG) funding from government. MIG funding provided by government to support municipalities has limitations to meet the demands for infrastructure. Further challenges to municipalities arose from the culture of non-payment of services within the municipalities. Eventually, funds generated to cater for infrastructure projects are never adequate to meet growing demand

Since 1994, various Contractor Development Programmes (CDPs) have been used by the Limpopo Provincial Government as a vehicle for producing skilled contractors in Limpopo Province. The key aspect of the programmes has been to enable new entrants to acquire labour-intensive construction techniques. In this programme, provincial departments and municipalities collaborate with the Construction Education Training Authority (CETA). In this arrangement, CETA provides funds and training opportunities to new entrants. The Expanded Public Works Programme (EPWP) has been used to generate labour-intensive jobs for the unemployed youth.

In the drive to create labour intensive economic activities, various programmes and projects were established in various sectors of the economy such as infrastructure, economic, social and environment (LPDWP, 2015). Increased capacity of Expanded Public Works Programme (EPWP) enabled the realization of economic impact consistent with government objectives. Further, toward this objective, the development programme for emerging contractors was bolstered with an intake of 500 youth for enrolment into the National Youth Service Programme (NYSP) in Limpopo Province. Five percent of the 500 youth were absorbed into the Limpopo Provincial Department of Public Works.

3.5.3 Lack of transparency in tender procedures

Generally, there are challenges regarding tender transparency arising from inherent inconsistencies in the handling of relevant tender documentation (Worku, 2017). This process is prone to deliberate human irregularities to influence pre-determined outcomes. One’s

ability to influence tender outcomes is a valuable asset against which there is a premium. According to Worku (2017) there is uncertainties over the outcomes of tender processes rank amongst the highest factors contributing to the dissatisfaction and despair of small contractors. As a solution thus there is need for transparency in the tender adjudication process through the implementation of standard operating procedures, which are subject to scrutiny, would contribute significantly toward restoring the credibility of the process.

3.5.4 Risks related to partnering construction projects

The risks are developed from the nature of the operation that causes conflicts within the partnering organization. The project-specific risk group refers to unexpected developments during the construction period that lead to time and cost overruns or in shortfalls in performance parameters of the completed project. A high capital outlay and a relatively long construction period would make project costs particularly susceptible to delays and cost overruns. The external risk group represents the risks that emanate from the competitive macro environment that the partnering operates in. The objective of this paper is therefore to identify the effective risk management measures applied to mitigate the risks faced by the construction industry from the used of the partnering procurement method in construction industry sector.

3.5.4.1 Disagreement on profit/loss, accounts and work allocation

Another critical risk factor was the disagreement on accounting profits and losses. It was ranked as second. Other disagreements such as the allocation of the staff position and the allocation of work received a less critical score, ranking 7th and 8th, respectively. Dispute over work allocation often happened when designs were changed, and the changes were unfavourable to one of the partners.

3.5.4.2 Policy of parent companies toward partnering

The policy of parent companies toward the partnering was very critical and this risk factor was ranked 4th. The parent companies could influence a Partnering performance by limiting its autonomy, contributing under-qualified staff and delaying the required funds.

Once the policies of a parent company changed, support for the partnering be reduced and it was difficult to keep the partnering running smoothly.

3.5.4.3 Distrust

Distrust among Partnering staff from different partners was also a critical risk factor in Partnering. It ranked third. In a typical Partnering, both general managers and functional managers would be drawn from their parent company to balance the influences from each

parent company. Each manager was given mandate to both manage the partner and look after the parent company's interests. Thus, it was not surprisingly that the working relationship between the two managers tended to be strained, cumbersome and inefficient.

3.5.4.4 Technology transfer dispute

Technology transfer dispute was the least critical factor in this group. Technology transfer was usually carried out in limited areas, through training to local staff during the design and construction phases. The companies existed mainly for commercial gain and their main objectives were more concerned with completing the project on time and budget rather than successful technology transfer.

3.5.4.5 Clients' problems

Clients' problems are comprised of two main elements: (1) cash flow problem; and (2) excessive demands and variation during the project's execution. A client's cash flow problem is regarded as the most critical risk factor to partnering. It received a value and was ranked first in this group among all factors considered in this research. This financial risk to the partnering contractor included whether the owner had sufficient funds to complete the project or had the availability of funds for progress payment. Thus, a client's cash flow problem did influence the cash flow of the contractor. Excessive demands and variation ranked fifth in this group. The risk to the partnering lay in the potential significant change of work allocation within partners, the disruption of work and associated claims.

3.5.4.6 Managers unwilling to relinquish control

This risk was also considered the most significant which supported the view held by Gattorna and Walters (1996). If senior management refused to allow a project team to act in accordance with project goals, then this would obviously impede a successful Partnering relationship. Partnering involved TQM principles which including involvement in decision-making at all levels. If management refused to support such a culture, then benefits were likely to be reduced.

3.5.4.7 Project relationship

The other most critical factor was poor project relationship which received a critical value and ranked 3rd in the project-specific risk group. A lack of communication and poor relationships could occur within the parties in a project. Relationship could become strained when the partner went directly to the client without informing his counterpart first.

3.5.4.8 Sub-contractors and suppliers

Currently, in the construction industry, many project activities are being sub-contracted by the main contractor. These risks were uncertainties related to the sub-contractor's or supplier's technical qualifications, punctuality, reliability and financial stability (Akinci & Fisher, 1998). These risks could result in time loss and increased costs during construction. This risk is rated 4th as a critical risk factor in the group.

3.5.4.9 Contractual risk

Compared with other risks, disagreement on some conditions in the contract was considered to be less critical. It was ranked last in this group. The average index was 1.68 and still quite critical. Building contracts dealt with the relationships between parties in the contract and the allocation of risks.

3.5.5 Scarcity of skilled personnel in construction environments

Construction companies in South Africa are prepared to spend money to raise their production capacities, the scarcity of skilled personnel would necessitate skilful project management and innovative solutions to prevent bottlenecks. It is difficult to fathom the words 'scarcity of skilled personnel' in a country of a billion people that is getting younger over time, but the challenge of scarcity of trained skilled construction labour is glaring in the industry.

Magar (2007) submits that the construction industry remains one of SA largest employers of labour, and realizing the need for skilled vocational staff, the industry has begun collaborating with academic institutions to either train staff for plumbing and masonry type work, or to set up in-house training programs. Sooi (2007) reports that the construction industry is Limpopo is grappling with unfilled positions in the skilled environment sector, he suggests that an immediate solution would be importation of right talents from abroad.

3.6 CONCLUDING SUMMARY

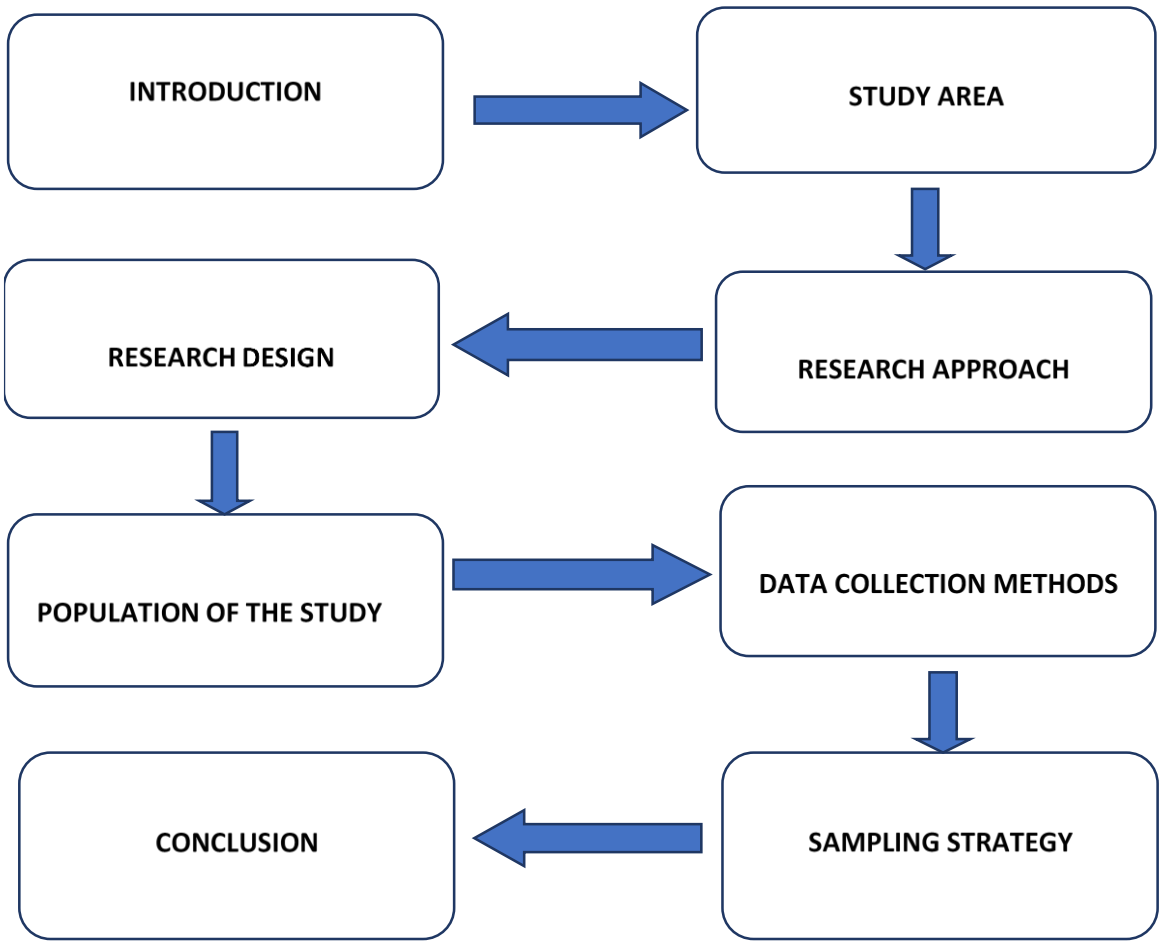
The project-specific risk group refers to unexpected developments during the construction period that lead to time and cost overruns or in shortfalls in performance parameters of the completed project. A high capital outlay and a relatively long construction period would make project costs particularly susceptible to delays and cost overruns.

The external risk group represents the risks that emanate from the competitive macro environment that the partnering operates in. The objective of this paper is therefore to identify the effective risk management measures applied to mitigate the risks faced by the construction industry from the used of the partnering procurement method in construction industry sector.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 STRUCTURE OF THE CHAPTER



4.2 INTRODUCTION

The previous chapter provided the conceptual and contextual setting for the study. This chapter outlines the procedures that were following in doing this empirical research. It oulines the research design, the sampling procedures and the data collection and analyses procedures used to answer the main research question and test the hypothesis about project partnering as strategic risk management approach in construction projects. The chapter also discusses how the sample was derived, the sample size, the research instrument, data collection procedures, the data analysis tools and the ethical considerations.

4.3 STUDY AREA

Study area of the study was the DPW representing the "Owners" of projects in the Limpopo Province and the associated contractor for each project.

4.4 RESEARCH APPROACH

Research can be conducted through qualitative or quantitative research methods. Saunders, Lewis and Thornhill (2007) noted that qualitative research methods investigate a particular research problem in detail since; these methods discuss the research problems in words instead of discussing the matter in numerical words. The analysis of quantitative data has also been incorporated through detailed discussions which represent the quantitative research methods.

Bryman and Bell (2007) noted that quantitative research methods investigate a particular issue through facts and systematically approach. The quantitative research methods also involve analysis of research questions through statistical or mathematical tools. The aim of the study is to establish the relationship between risk and partnering in projects and thus allow integration of project partnering and risk management models.

Table 4.1. Summary of quantitative and qualitative research designs

	QUALITATIVE	QUANTITATIVE
Objective	To gain qualitative understanding of the underlying reasons and motivations of a certain behaviour	To quantify data and generalise sample results to the whole population using inferential statistics
Sample	Small number of non-representative cases	Large number of non-representative cases
Data collection	Unstructured/informal and flexible	Structured/formal
Data analysis	Non statistical and heavily reliant upon the researcher's interpretations	Statistical and findings are usually expressed in numbers

Outcome	Develop an initial understanding	Recommend a final course of action
Types of data	Verbal statement qualification	Numbers/statistics
Tools for data collection	Focus groups, case studies, observation, unstructured depth interviews	Use of surveys, questionnaires, personal interviews, archives, shopping mall surveys and experiments

Source: Maholtra (2014)

The rationale for selecting a quantitative study is that it is a cheaper, flexible, and more objective research approach given budgetary and time limitations to which this study is subjected. 'Generalisability's defined as the degree to which a sample-based study can be applied to the whole universe (Maholtra, 2004) and a quantitative study enables the researcher to know how far the findings are true of the population from where the respondents have been drawn.

South Africa provides an interesting environment for the examination of construction project adoption of the Internet. While the South African economy is certainly not a high performer in its technology adoption relative to developed countries, it is certainly most economically and technologically advanced nation in Limpopo. Nevertheless, the South African economy is stagnating. Similarly, with other third world countries, South Africa is faced with a myriad of economic challenges. The country's role as a regional leader, therefore, allows us to draw lessons from the South African projects use of the Internet and apply these findings elsewhere.

A quantitative study seeks to apply some form of statistical analysis to increase accuracy of results and hence seek to reduce potential errors when generalising findings (Martins, 1996); Creswell (2003). Replication is made possible because every interview in the survey follows the same procedure (Dhurup, 2008). Greater volume and wider variety of data is also obtainable from quantitative studies as compared to qualitative studies.

4.5 SAMPLING STRATEGY

The strategy followed in this research study highlights the following aspects of a sample.

4.5.1 Target population

The universe (population) is the total of units from which individual units are selected (Martins, 1996:251). However, a sample is the "element of the population considered for actual inclusion in a particular study" or it may be viewed as a subset of the population which we are interested in (Neuman, 2006:219). Often it is impossible to identify all the members of the population because the size of population elements is very large and hence, it would be expensive and time consuming to collect the vast amounts of data. As such researchers study the sample because of its feasibility, low cost, accuracy and speed (Khan, 2007).

In this study, the sample was confined to the DPW representing the "Owners" of projects in the Limpopo Province. Companies within the same region will be assessed to avoid distortions which may result from using units of analysis which are located in different areas (Bruque & Moyano, 2007:243).

4.5.2 Sample frame

This constitutes a list or database for obtaining a representation of the elements of the target population (Maholtra, 2004). In this study, various databases were consulted to obtain details of respondents. These included lists from the DPW, telephone directories, Internet databases and the various municipalities that are included in the demarcation.

4.5.3 Method of sampling

Two sampling techniques are generally used in research surveys, and these are probability and non-probability sampling. Martins (1996) explains these techniques in the following manner:

- Probability sampling is where the sampling units are selected according to probability theory with each population unit having a known chance of being selected. Statistical projections of the sample can then be generalised to represent the total population considering the possibility of generating sampling error. Sampling error refers to the degree in which the sample results might differ from the whole population. Random, systematic and stratified samplings are examples of probability sampling methods.
- Non-probability sampling relies on the researcher's personal discretion. Population items to be used in the sample are randomly selected. In most cases the researcher uses intuition, personal judgement or past experience to select sample items. However, in some cases only the items that offer convenience are included in the sample. Statistical tools are not applied and thus the sampling error remains unknown. Convenience, quota, judgement and snowball sampling are all examples of non-probability sampling.

In this study, stratified probability sampling was used. The DPW population was divided into segments according to industry sector. Thereafter random sampling was performed proportionately on each selected stratum to constitute the sample size. For example, if 20% of DPW in the population (N) fall under the industry sector, then 20% of the sample size (n) would be made up of construction industry sector.

Stratified sampling was chosen because it allows various population elements to be included in the sample in the correct proportions. Variations within the sample segments tend to disappear and if we can succeed to divide the population into mutually exclusive strata whose elements are homogenous then this helps to reduce sample error (Armstrong & Kotler, 2007); Martins (1996).

4.5.4 Sample size

A sample size of 150 was be used for this study. This sample size was determined from an analysis of similar previous studies.

4.5.5 Response rate

This is calculated as the number of questionnaires returned or completed divided by the total number of eligible people who were contacted to participate in the survey (Zikmund, 1999). Follow-up reminders and phone calls were used to encourage respondents to complete the forms. Each organisation was contacted via e-mails and phone calls and cover letters that assured confidentiality were used to encourage respondents to complete the forms and thus increase response rate.

4.6 DATA COLLECTION METHODS

Methods of data collection are usually influenced by the selected research approach. Since this study adopts a quantitative research approach, a survey method of data collection using a questionnaire was considered to be most ideal. The questionnaire will be discussed in the next section.

4.6.1 Questionnaire attributes

Table 4.2 below presents an analysis of questionnaire characteristics when applied in different scenarios.

Table 4.2: Main attributes of questionnaires

Attribute	On line	Postal	Delivery and collection	Telephone	Structured interview
Population's characteristics for which suitable	Computer-literate individuals who can be contacted by e-mail or internet	Literate individuals who can be contacted by post, selected by name, household, organisation etc		Individuals who can be telephoned, selected by name, household, organisation etc	Any; selected by name, organisation, in the street etc
Confidence that right person has responded	High if using e-mail	Low	Low but can be checked at collection	High	
Likelihood of contamination or distortion of respondent's answer	Low	May be contaminated by consultation with others		Occasionally - distorted or invented by interviewer	Occasionally-contaminated by consultation or distorted/invented by interviewer
Size of sample	Large, can be geographically dispersed		Dependent on number of field workers	Dependent on number of interviewers	
Likely response rate	Variable, 30% reasonable within organisations, Internet 10% or lower	Variable, 30% reasonable	Moderately-high, 30-50% reasonable	High 50% - 70% reasonable	
Feasible length of questionnaire	Conflicting advice; however, fewer "screens" probably better	6-8 A4 pages		Up to half an hour	Variable depending on location
Suitable types of	Closed questions	Closed questions but not too complex, simple		Open and closed	Open and closed

questions	but not too complex, complicated sequencing fine if uses IT; must be of interest to respondents.	sequencing only, must be of interest to the respondent		questions, but only simple questions, complicated sequencing fine	questions, including complicated questions, complicated sequencing fine.
Time taken to complete collection	2 - 6 weeks from distribution (dependent on number of follow-ups)	4-8 weeks from posting (dependent on number of follow-ups)	Dependent on sample size, number of field workers etc.	Dependent on sample size, number of interviewers etc but lower than self-administered for same sample size	
Main financial resource implications	World wide web page design	Outward and return postage, photocopying, clerical support, data entry	Field workers, travel, photocopying, clerical support, data entry	Interviews, telephone calls, clerical support, photocopying and data entry if not using CATI. Programming, software and computers if using CATI	Interviews, travel, clerical support. Photocopying and data entry if not using CAPI. Programming, software and computers if using CAPI.
Role of interviewer/field worker	None		Delivery and collection of questionnaires, enhancing respondent participation	Enhancing respondent participation, guiding the respondent through the questionnaire, answering respondents' questions	
Data input	May be automated	Closed questions can be designed so that responses may be entered using optimal mark readers after questionnaires have been returned		Response to all questions entered at time of collection using CATI.	Response to all questions can be entered at time of collection using CAPI

Source: Saunders Lewis and Thornhill (2003:284).

4.7 RESEARCH DESIGN

According to Welman and Kruger (2009), a research design can be defined as a plan for obtaining research participants (subjects) and collecting their information. The researcher will explore the relationships between partnering and risk in research using quantitative and qualitative research.

Research design provides a blueprint or roadmap that guides the researcher (Malholtra, 2004). Best and Khan (1993:24) concur that research design is "various ways of collecting and analysing information including procedures employed and data gathering instruments". This study used a descriptive research design to pave the way for correlational and multiple regression analyses. This design enables the researcher to ascertain, describe, and relate the characteristics of the variables of interest.

Descriptive research focuses on specific aspects of the problem under study. Thus, it is a fact-finding study that provides satisfactory interpretations. The advantage of using this method is that large volumes of information can be collected in a short space of time to analyse the collected data. The strength of this design is that effects will be observed in authentic contexts. The study was an investigative study examining the relationship between partnering and risk in projects through questionnaires. The research variables will be measured quantitatively and analysed for correlation between them. This is deemed necessary to develop an integrated model.

4.8 POPULATION OF THE STUDY

The first step to ensure a representative sample is using a complete and correct sampling frame, a list of all units from which the sample is drawn. A population is an object which has all the data and information on the research phenomenon under study (Wegner, 2009).

The sampling frame for this research was the lists of project managers of the DPW representing the "owners" of projects and the associated contractor for each project.

4.8.1 Sample and sampling methods

A sample is part of a large population. In the same vein, a sample can be explained as representing units of the whole population. In this study, a sample of one hundred questionnaires was distributed to the respondents, contractors, and project owners, respectively. The data was collected using self-administered open-ended questionnaires. Probability sampling in the form of a simple random sampling method was used. A list of construction project managers was obtained from the Department of Public Works. Each

project manager identified the contractors used in his/her project. The number of employees is less than 150 according to a letter from the department.

Accidental/convenience sampling in the distribution of questionnaires was considered and seemed available to the researcher. Therefore, the researcher approached the respondents who were conveniently available and accessible. On the other hand, purposive sampling, also known as judgmental, lets the researcher decide what needs to be known and sets out to find people who can and are willing to provide the information based on knowledge or experience.

4.9 DATA COLLECTION METHODS

Self-administered questionnaires containing open-ended questions were used to gather data from selected contractors and project managers. Lancaster and Geoffrey (2009) have noted that there are two types of data. These are identified as primary data and secondary data. The primary data refers to the data collected by researchers through interactive research instruments such as surveys and interviews.

4.9.1 Data collection procedures

Self-administered questionnaires containing open-ended questions were delivered to the respondent by the researcher but completed by the respondents with no researcher involvement. Self-administered questionnaires ensure the anonymity and privacy of the respondents, thereby encouraging more candid responses. Questionnaires also help to ensure that information from different respondents is comparable (Cooper & Schindler, 2001).

4.9.2 Questionnaire

A questionnaire is an impersonal research instrument made up of a series of questions that a respondent answer. It is standardised, and the respondent usually fills it in as per instruction.

Two questionnaires were used. The questionnaire measuring risk was standardised (Government of Canada, 2001) but was adapted to suit the intended research. The questionnaire used to measure risk has been used in previous research and practical situations, but no proof of standardisation could be found. Therefore, the internal consistency of the questions in each case was tested. Respondents were also approached via emails. A structured questionnaire was developed for data collection. Other questions are open-ended for the respondent to express their perceptions flexibly rather than only choosing an option already with a set of answers. Some question items are measured by responses on a five-point Linkert scale in agreement/ relevance with statements, ranging from 1= Strongly Disagree/ Completely Irrelevant to 5= Strongly Agree/ Completely Relevant.

Extensive use was made of Linkert Scale to measure attitudes and opinions of respondents on user perceptions on relationships between partnering and risk. Linkert scales were preferred, as they proved more appropriate in finding out the objectives of the survey. Linkert scales proved very convenient to respondents as they quickly captured their opinions without unnecessarily them in complex comparisons, which would otherwise have taken more of their time. Questionnaires were distributed easily within a short period, reducing distribution costs on the researcher's part. Some participants did not fill in the questionnaire timeously; the researcher followed up to gather all the questionnaires in time.

4.10 DATA PRESENTATION AND ANALYSIS PROCEDURE

The data collected through questionnaires was analysed using two statistical techniques by testing it through Correlational and multiple regression analysis. Before conducting correlation on the data collected, it was put to descriptive analysis to reveal the customer demographic characteristics of the respondents.

The data gathered from the field through the questionnaires administered were recorded and coded into Excel. In analysing the data gathered from the field (questionnaire), frequencies, means, and reliability were primarily calculated using Excel. The use of multiple regression analysis was to help test the conceptual framework or model, whiles the analysis of the descriptive statistics was computed and used in the interpretation of findings.

4.10.1 Regression and correlational analysis

The regression model was used to determine the relationship among the variables as mentioned above. Regression is the statistical tool generally employed to examine the relationship between a dependent and an independent variable. The method was preferred in this study because of its ability to produce the best linear unbiased estimate. According to Sykes, regression analysis is a statistical tool for the investigation of relationships between variables.

There are different methods of estimating regression functions that can be used for data estimation, the generally used ones being the Ordinary Least Squares (OLS) and the Maximum Likelihood (ML) (Gujarati, 2004). Data from the questionnaire was used for the regression model. The regression model suited the research because, among other outcomes, the research demanded numerical interpretations. The research also had a hypothesis question, thereby calling for a regression model and a correlation matrix.

4.11 CONCLUDING SUMMARY

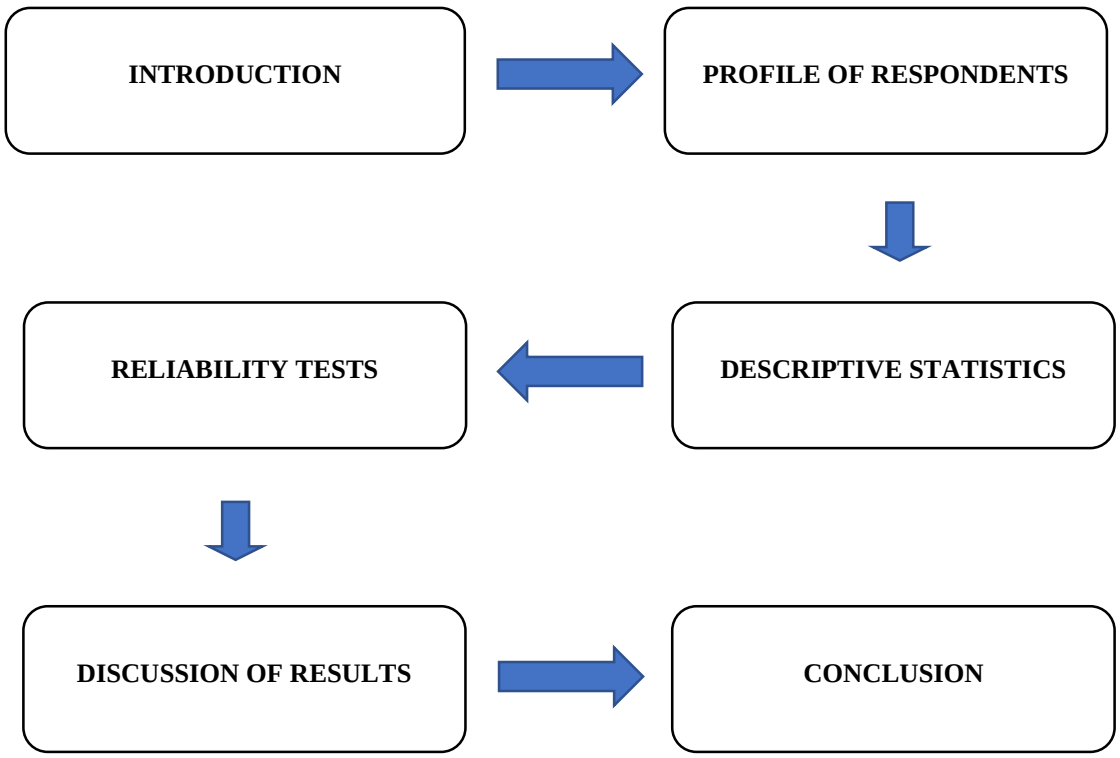
This chapter defined the research design using descriptive research design, paving the way for correlational and multiple regression analyses. Both qualitative and quantitative research techniques are used. The quantitative part is for the acquisition of actual data through a questionnaire which is the research instrument of the survey.

A brief explanation of correlational and regression protocols on service quality dimensions were provided to pave the way for better interpretations of the findings and answer the objectives. The following chapter analyses the results of the criteria employed in this section.

CHAPTER 5

PRESENTATION AND DISCUSSION FINDINGS

5.1 STRUCTURE OF THE CHAPTER



5.2 INTRODUCTION

This chapter discusses the data analysis and results obtained from the research study's questionnaire conducted in the industrial construction sector in Limpopo. According to De Vos (2002), data analysis represents the process of bringing order, structure and meaning to the mass of collected data. The main objective of this research study is to collect data to identify the risk management practices and procedures enterprises have in place to mitigate project risks in Limpopo. The data collected from the research study's questionnaire were analysed and presented using descriptive statistics to quantify the data according to the study's primary research objective.

5.3 METHOD OF ANALYSIS

The procedures the Cape Peninsula University of Technology (CPUT) statistician and researcher followed to validate the questionnaire's results and responses obtained are described in this section.

5.3.1 Validation of the questionnaire results

The responses' reliability was measured using the coefficient (refer to section 5.4.1, Reliability test). The coefficient was applied to measure the instrument's internal reliability and consistency.

The questionnaire consisted of 29 closed-ended questions intended to measure whether the construction industry in Limpopo has risk management and control procedures in place to mitigate project risks.

The data obtained from the questionnaire were validated in the Microsoft Excel template by using pre-defined dropdown lists to capture the participants' responses. Thus, the pre-defined dropdown lists served as a validation check to prevent any data-capturing anomalies and errors. Furthermore, as the questionnaire consisted only of closed-ended questions, standardised responses were captured in the Microsoft Excel template for simplified preliminary analysis methods to be applied.

5.3.2 Data format

The data collated from the questionnaire responses were captured by the researcher in line with the design and numbering convention of the questionnaire into the Microsoft Excel template and imported to IBM NCSS 9 statistical software by the CPUT statistician. This allowed the CPUT statistician to align the coding and quantitative information to the questionnaire's pre-determined numbering scheme.

The Likert-type scale used in the questionnaire was coded as follows:

- Strongly agree 5
- Agree 4
- Undecided 3
- Disagree 2
- Strongly disagree 1

The researcher checked the prepared data sets to ensure that the correct codes were applied for the Likert-type Scale.

The researcher also validated 75% of the completed questionnaires by asking the following questions telephonically:

- "Does your organisation use social media platforms?"
- "Does your organisation have a social media policy in place that guides the use of social media?"

- “Does your organisation have a risk management function to assess and monitor social media risks?”

The above questions were used as they closely relate to the questions asked in the questionnaire and objectives of this research study.

5.3.3 Preliminary analysis

Descriptive analysis was performed on the original values to illustrate frequencies, cumulative frequencies, percentages and cumulative percentages. Descriptive analysis was also performed on closed-ended questions (“Yes/No” responses) or on statements to be selected. This descriptive analysis was performed to ensure that the original values of all questions in the questionnaire were analysed and presented data for interpretation. These are described in section 5.3.6 (Refer to Appendix F for printouts of raw data analysis results.)

5.3.4 Inferential statistics

Multiple variables of the questionnaire for Likert-type Scale questions were measured using coefficient to illustrate how well a set of multiple variables relates to a single variable which provides for analysis of any relationships and trends for interpretation. The coefficient value will be higher when there is a similar correlation between variables of statements that are compared. The coefficient is usually low when the data has multiple variables that are not related and has multiple constructs. The researcher generally accepts the coefficient of 0.50 and above to correlate the level of reliability of the data (Nunnally, 1978) cited by Smit (2012).

As mentioned in section 5.3.3, closed-ended questions such as “Yes” and “No” responses or questions that prompted statement selections were grouped. The researcher performed comparative analysis to illustrate descriptive analysis for interpretation for the objective of this research study.

5.3.5 Assistance to the researcher

The data analysed were interpreted and reviewed with the assistance of the CPUT statistician to reach conclusions on the quantitative information provided. This was performed to ensure any misinterpreted information and data analysis errors were excluded from the final results extracted from the quantitative information.

5.3.6 Sample

For this research study, purposive sampling was applied to collect information from the industrial construction sector in Limpopo. The targeted sample of individuals approached consisted of employees from constructions in Limpopo. They use and are aware of social media and understand its usage in the enterprise where they are employed.

5.4 ANALYSIS

Table 5.1 shows a response of 95% (109) from the 115 questionnaires distributed. An analysis was performed only on the 109 questionnaires completed in full.

Table 5.1: Questionnaire response rate

	Questionnaires distributed	Questionnaires returned	Response rate	Race	Levels of education	Experience in years
Respondents	115	109	95%	Black	Degree	5
Total	115	109	95%	Black	Degree	5

5.4.1 Reliability test

The coefficient was applied to all statements consisting of Likert-type Scale responses in the questionnaire. Table 5.2 below and Appendix C illustrate the coefficients. This table indicates the correlation between each question's statements and the overall coefficient applied.

The table also indicates the consistency of the coefficient if a respective statement was deleted. This measure indicates the correlation of the statement's effect on the coefficient. Therefore, in column 3 (coefficient column), the scale's reliability would be higher if any statements were omitted.

The results of all three tests were used to check the reliability of the research measures. First, the internal consistency of the research measures was checked by using the coefficient of constructors. Next, constructor values for each of the scales were computed for each construct. The overall reliability of the scale used (Nunnally, 1978) recommended that a reliability benchmark value and above should be regarded as acceptable.

The second measure of internal consistency is composite reliability. Composite reliability is a variety of robust reliability estimates, such as omega and intra-class correlation coefficient (Starkweather, 2012). Interpreted as a constructor, the CR measure threshold for "modest" is

data. Composite reliability is computed from the squared lambda values and the summation of the error variance terms.

According to the coefficient in Table 5.2 for the statements measured in the questionnaire using the Likert-type Scale, the overall coefficient for raw variables is 0.1705797. The overall coefficient for standardised variables is 0.033341. Therefore, the overall coefficient for raw and standard variables is greater than the acceptable level of 0.50, indicating that the data is reliable for analysis.

Table 5.2: Coefficient for survey measuring Instruments

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.137661787	1.22952009	2.55194	0.012418	0.694631563	5.580692	0.69463156	5.58069201
Risk Identification	0.135251452	0.27504792	0.491738	0.624115	-0.41126291	0.681766	-0.4112629	0.681765813
Risk planning	0.009438579	0.13127628	-0.0719	0.942844	-0.270281758	0.251405	-0.2702818	0.2514046
Risk assessment	0.150489881	0.13898788	1.082755	0.281842	-0.125676084	0.426656	-0.1256761	0.426655847
Risk analysis	0.042837835	0.09281647	0.461533	0.645543	-0.141586505	0.227262	-0.1415865	0.227262176
Risk response	0.033341106	0.17057974	0.195458	0.84548	-0.305597198	0.372279	-0.3055972	0.372279411

According to the coefficient in Table 5.2 for the statements measured in the questionnaire using the Likert-type Scale, the overall coefficient for raw variables is 0.1705797. The overall coefficient for standardised variables is 0.033341. Therefore, the overall coefficient for raw and standard variables is greater than the acceptable level of 0.50, indicating that the data is reliable for analysis.

The variables for Q7 and Q8 were excluded from the overall coefficient for standardised and raw variables to ensure that an acceptable level of reliability is calculated. Therefore, the coefficient measuring instrument provided an acceptable level of reliability and consistency for the statements analysed.

5.4.2 Univariate graphs

As explained in section 5.3.3, descriptive statistics on the analysis performed is illustrated and described in the univariate graphs below as per the individual sections of the questionnaire

designed. The descriptive statistics provide details on the analysis results and findings extracted from the univariate graphs for the individual sections of the questionnaire.

Majority of the respondent were able to define business processes

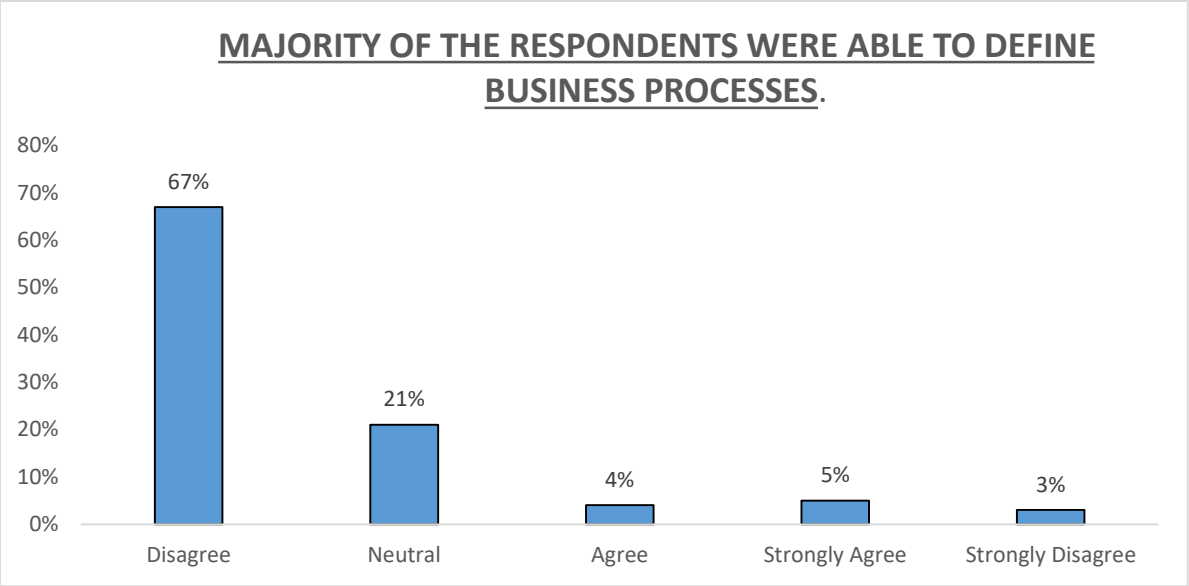


Figure 5.1: The majority of the respondents were able to define business processes

Respondents were provided with a list of business processes to indicate which majority are used by the industrial construction sector and what the majority are used for, i.e., “business” process, “business & project” processes, or “project” processes and if the majority was not used “Strongly Disagree”. Combining “business” processes, “business & project” processes, “project” responses provided statistics on only the usage of the above project used by the construction sector. Listed in descending order, these statistics are:

- Strongly Disagree (3%)
- Strongly Agree (5%)
- Agree (4%)
- Neutral (21%)
- Disagree (67%)

A review of the above list of project risks used by the construction industry shows that Neutral, Disagree and Strongly Agree are the most popular project risks used by the construction sector. By reviewing the specific processes of the project risks used by the construction sector, the statistics of the top three project risks’ are discussed below. Based on

the results, it is evident that Disagree (67%), Neutral (21%) and Strongly Agree (5%) are the project risks in the construction sector used chiefly for “business” processes.

However, it is also clear that many of the construction or projects are unsure or do not use the risks for business, more specifically as far as Strongly Disagree (3%) and Agree (4%) are concerned.

5.4.2.1 Understanding the various processes

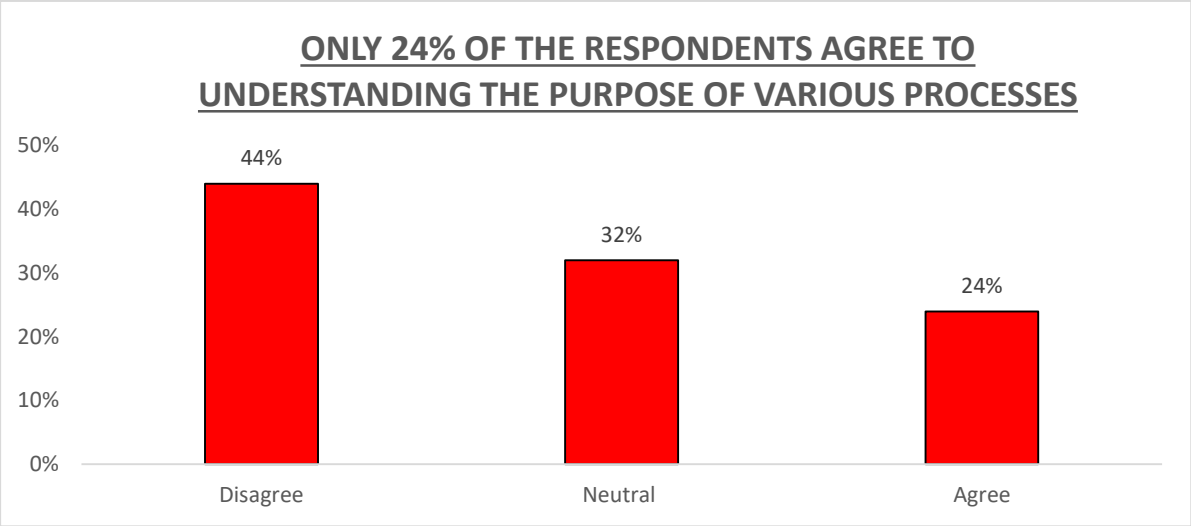


Figure 5.2: Understanding the various processes

According to Figure 5.2, 32% of the respondents are undecided on their understanding of various purposes. Based on the results, it is evident that Disagree (44%), Neutral (32%) and Agree (24%) are the project risks in the construction sector used primarily for “business” processes.

5.4.2.2 Understanding of responsibilities in various processes

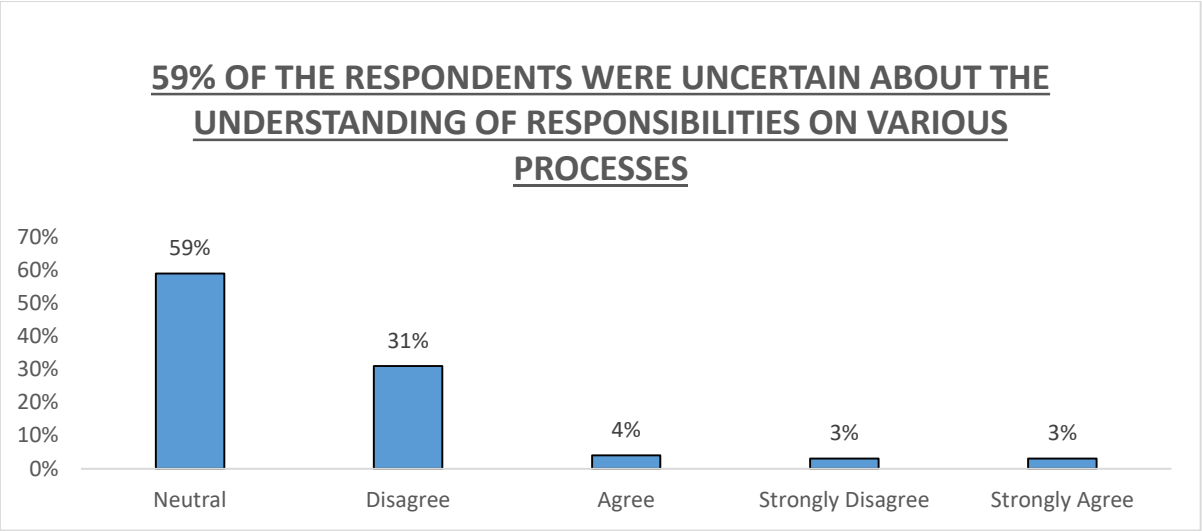


Figure 5.3: Understanding of responsibilities in various processes

According to Figure 5.3, 59% of the respondents are undecided on their understanding of various purposes. A review of the above list of project risks used by the construction industry shows that Neutral, Disagree and Strongly Agree are the most popular project risks used by the construction sector. By reviewing the specific processes of the project risks used by the construction sector in Figure 5.1, the top three project risks' statistics are discussed below. Based on the results, it is evident that Disagree (31%), Neutral (59%) and Strongly Agree (3%) are the project risks in the construction sector used primarily for "business" processes.

However, it is also clear that many of the construction or projects are unsure or do not use the risks for business, more specifically for those who Strongly Disagree (3%).

5.4.2.3 Respondents were able to identify critical stage processes

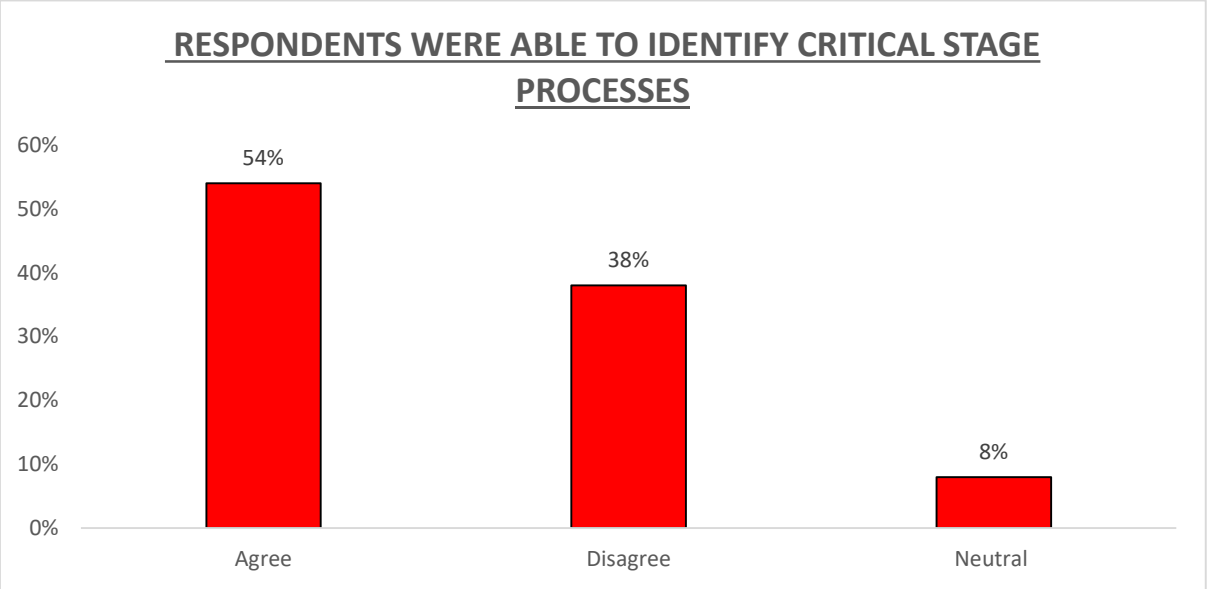


Figure 5.4: Respondents were able to identify critical stage processes

According to Figure 5.4, 54% of the respondents are undecided on identifying critical stage processes. The graph shows that 38% of respondents know their responsibilities in various processes; their personal/social use projects. A small percentage (8%) access projects at their construction sectors at the personal level.

5.4.2.4 Respondents understanding of how processes integrate

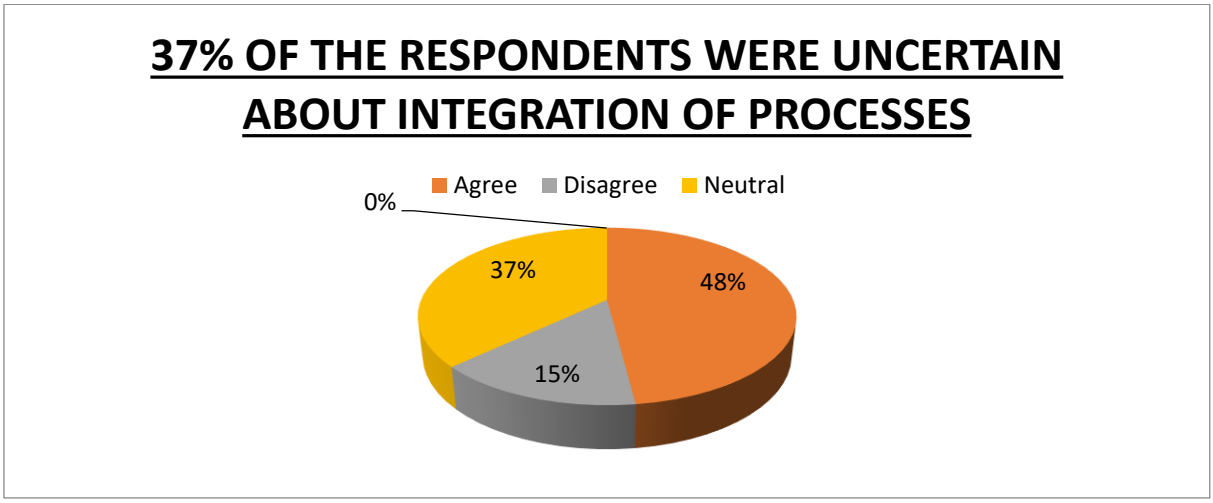


Figure 5.5: Respondents understanding of how processes integrate

According to Figure 5.5, 37% of the respondents are undecided on how processes integrate. 48% do not understand how one process integrates with other processes. Respondents are inclined towards integration with other processes. A small percentage of employees (15%) access projects at their construction sectors for personal level.

5.4.2.5 Gender composition

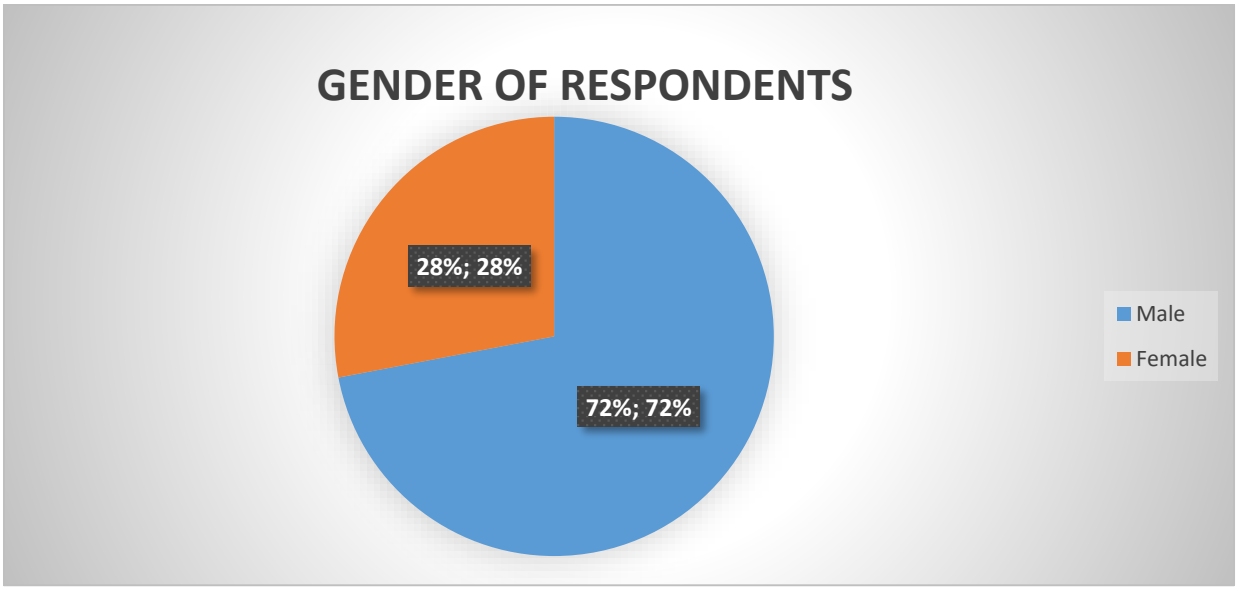


Figure 5.6: Gender composition

According to Figure 5.6, 72% of the participants were male, while 28% were female.

The statements which respondents moderately to strongly agreed to are in descending order as follows:

- 67% of the employees confirmed that the project could negatively affect the construction industrial's external reputation among business partners such as customers, suppliers and competitors;
- 57% of the employees confirmed that the project could negatively affect the reputation of the construction sectors brand, credibility, trust and loyalty, should a service or product be affected;
- 54% of the employees confirmed that construction sectors could negatively affect the construction industrial's internal reputation among key stakeholders, employees and shareholders;
- 44% of the employees agreed that project risks could result in the imposition of non-adherence regulatory and legislative requirements which might impact the construction sector negatively; and

- 36% of the employees stated that the project could negatively affect the financial performance and position of the construction sectors.

5.5 SUMMARY OF RESULTS AND FINDINGS

5.5.1 Results

- The industries that had the greatest responses were “Other” at 31% and “Financial Services” at 23%;
- 61% of the respondents who participated came from large enterprises (more than 200 employees) and 35% from small (0–100 employees) enterprises;
- 49% of the respondents are in non-managerial positions or specialists, 33% are middle management; and
- 66% of the respondents have been employed for 0–3 years, while 34% have been employed in their present position for 4 –11 years and more

5.5.2 Findings

The results indicate that responses were obtained from various industries, with nearly two-thirds from large organisations. Non-managerial/specialist and management positions are almost evenly presented in the survey, while two-thirds have been in their present position for a short period – three years and less.

5.6 CONCLUDING SUMMARY

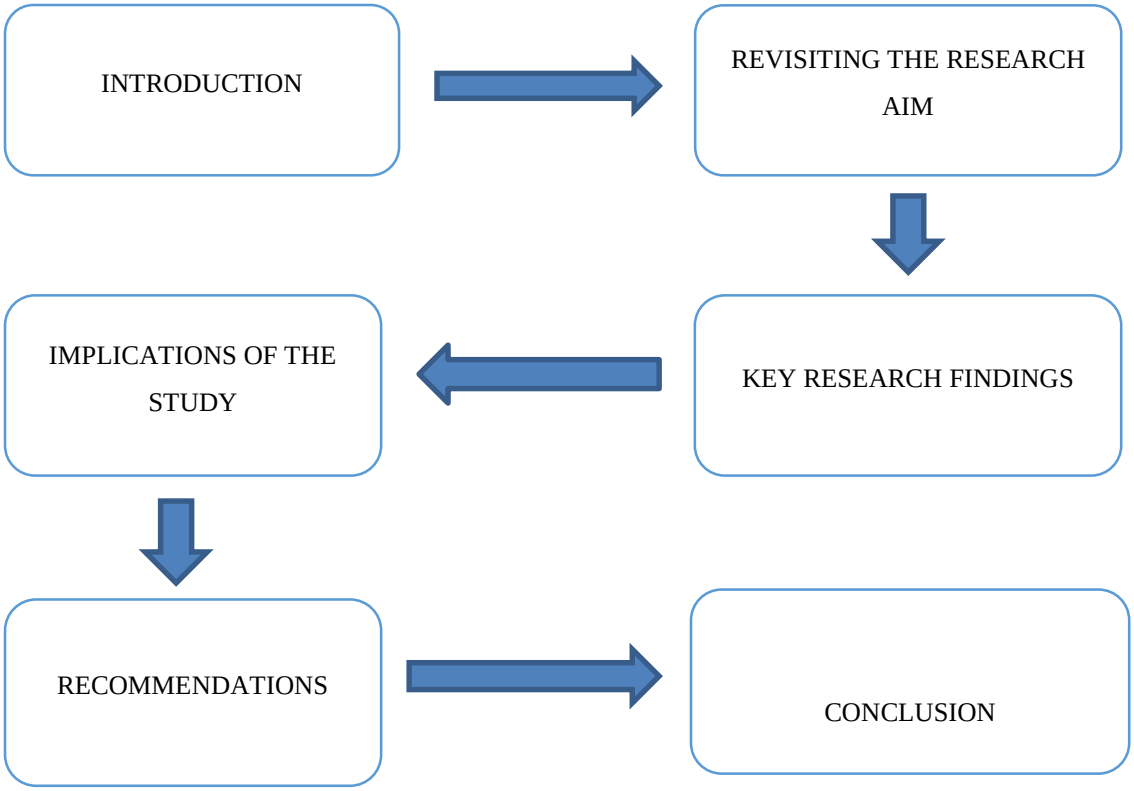
This chapter provided the data analysis, presentation and interpretations; illustrating the descriptive, inferential and univariate statistics obtained from the research study. The findings and observations from the statistical analysis in this chapter are explained in more detail in this research study's last chapter, Chapter 6.

In Chapter 6, the literature sources reviewed in Chapter 3, the research study’s investigative questions and sub-research questions, and objectives and sub-objectives from Chapter 3 are revisited to ensure the application of the research methodologies and literature consulted correlates to the findings and observations extracted by the researcher and CPUT statistician from this chapter’s statistics.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 STRUCTURE OF THE CHAPTER



6.2 INTRODUCTION

The previous chapter provided the presentation, analysis and interpretations of data leading to this current chapter. This chapter (6) is the final chapter of the study. Primarily, this chapter's overall aim is five-fold. Firstly, it seeks to provide an overview of the study. Secondly, it endeavours to explicate the implications of the main findings contained in this study. The third purpose of this chapter is to report the contributions that these findings and conclusions of this study bring to practitioners, academicians, policymakers, and the body of knowledge within the discipline of internal auditing and governance.

The fourth purpose of this chapter is to report research limitations and provide direction for future studies. Finally, the last and equally important purpose of this chapter is to provide the overall recommendations of this entire study. In other words, it is now imperative to conclude and make necessary recommendations to policy and decision-makers. Of course, the

suggested solutions are not absolute, but the researcher hopes that the findings could be helpful in the assessment of risks and partnering within the construction industry sector.

6.3 REVISITING THE RESEARCH AIM AND OBJECTIVES

Chapter 1 of this research provided the background to the study, wherein the aim and objectives were stated under sections 1.4 and 1.5. The study aimed to identify the impact of partnering on risk management within the construction industry sector in Limpopo.

The key objectives of the study were:

- To determine the level of risk in projects where inter-organisational relations exist;
- To determine the level of partnering in projects where inter-organisational relations exist;
- To determine what the differences are in the assessment of risk and partnering between project owners and contractors;
- To determine what the correlation is between the level of risk and the level of project partnering; and
- To integrate the risk framework and partnering framework in developing an approach to reducing risks through project partnering in the construction industry.

Chapters 2 and 3 of the study were dedicated to the literature review, particularly focusing on identifying the differences in assessing risk and partnering between contractors. Solutions such as proposing an impact risk management environment specific for Limpopo construction projects is still an area for research that needs to be pursued. Other areas for future research include evaluating risk management effectiveness in donor financed public projects and a risk management model for competitive public infrastructure delivery.

The preceding chapters, four and five, gave the research methodology and the data analysis and presentations. These provided all the details about how the data was collected, coded and processed. Further, chapter 5 focused on the data analysis processes and provided the statistical indicators and interpretations of the data as espoused in the study.

6.4 ADDRESSING THE RESEARCH OBJECTIVE

6.4.1 Addressing research objective one

As outlined in earlier sections, the study's primary aim and research objectives were the guidelines giving direction to the study. These were achieved in the following manner:

l) **Primary findings**

- To determine the level of risk in projects where inter-organisational relations exist

  This objective was obtained from project partnering assessment, and a minute percentage both agree and disagree with this notion with a low level observed. This suggests that clients and contractors do not see the importance and benefits of project partnering and are not focused on this concept. Identification with critical stage process postulates that clients and contractors see partnering as another way of getting the project done; conventional methods are an alternative.

- To determine the level of partnering in projects where inter-organisational relations exist;

  In the Limpopo construction context, some contractors are mainly concerned about finishing the job soon, getting the money and quickly getting to the next job. However, constructive relationships through partnering add more work and too many responsibilities. As one-off projects dominate the construction industry, it would appear that project-specific partnering will likely take the leading role in promoting a closer relationship in construction projects.

II) **Secondary findings**

- To determine what the differences are in the assessment of risk and partnering between project owners and contractors;

  When the risks and partnering among parties, both the main parties are working towards achieving each other's goals and thereby outcomes and processes of achieving the outcomes will be very effective. However, the views of most respondents highlighted that in order for the project partnering concept to be more suitable and its outcomes to be more effective.

  This research concurs with National Research Council (1994) that partnering improves cash flow due to elimination of, or reduction in, disputes resulting in withheld payments. In addition, there is greater involvement in the decision-making process as an active team member in the project.

  A lack of communication and poor relationships could occur within the parties in a project. In most instances, both general owners and functional contractors would be drawn from their company interest to balance the influences from each parent company objectives

- To determine what the correlation is between the level of risk and the level of project partnering:

  The correlation analysis showed that most correlation coefficients are negatively skewed. This is because the partnering parties have different goals, i.e., the service provider (contractor), on the one hand, has profit as a goal, and the owner, on the other hand, has the goal to minimise the costs of the project.

- To integrate risk models and partnering models to develop an approach to reduce risk through project partnering;

  Three main strategies were identified from different views of each respondent to enhance the implementation of project partnering within the construction industry in Limpopo. The following problems in project partnering in construction were identified: lack of an adequate and precise definition of partnering, the potential conflict between commercial pressures and forms of collaboration in practice, and the inherent difficulties in changing organisational cultures to support collaborative approaches.

Although the study was confined to the aim and objectives, it is not surprising that extracted data revealed many more issues within the construction industry sector. The partnering parties have different goals, i.e., the service provider (contractor), on the one hand, has profit as a goal, and the owner, on the other hand, has the goal to minimise the costs of the project. A clear understanding and knowledge regarding the project partnering concept are vital to partnering relationships between parties involved in the project (Chan, Chan & Ho 2003). Thus, there is no congruence of goals and mission between the two parties.

According to Larson and Drexler (1997), regardless of the importance of direct open communication in partnering, some parties do not trust the other party and are unwilling to communicate and share important information. Sanders and Moore (1992) mentioned that problems do not disappear automatically by writing the partnering agreement. Conflicts and disputes among the parties involved in the projects are still possible. When the risks and partnering among parties, both the main parties are working towards achieving each other's goals and thereby outcomes and processes of achieving the outcomes will be very effective. However, the views of most respondents highlighted that in order for the project partnering concept to be more suitable and its outcomes to be more effective.

This research concurs with the National Research Council (1994) that partnering improves cash flow due to eliminating disputes resulting in withheld payments. There is greater

involvement in the decision-making process as an active team member in the project. A lack of communication and poor relationships could occur within the parties in a project. In most instances, both general owners and functional contractors would be drawn from their company interests to balance each parent company's objectives.

The indicate the general acceptance and importance of the hypothesis that service quality Intercept, risk lead to the interpretation of the regression analysis since the researcher wants to identify the differences in the assessment of risk and partnering between project owners and contractors. Solutions such as proposing an effective risk management framework specific for Limpopo construction projects is still an outstanding area for research. Other areas for future research endeavours include evaluation of risk management effectiveness in donor-financed public projects and a risk management model for a competitive public infrastructure delivery.

6.5 IMPLICATIONS OF THE STUDY

6.5.1 Implications for the construction industry sector

Construction project processes influencing risk management and construction operations should not only be the responsibility of partnering. All employees must assume the responsibility of observing project processes when performing their duties. The construction sector must create a conducive environment that informs all employees about the construction project processes and the importance of partnering roles on project processes. This could be achieved through risk management policy training, workshops and seminars. The construction industry could also consider conducting project self-assessment to establish how much employees understand project processes and continue to monitor their progress. If employees from all industry units understand project processes and the importance of the partnering role on risk management control activities, projects that safeguard public funds will be enhanced through suggestions and willingness of employees in different units to uphold the project process.

6.5.1.1 Controlled environment

Construction sectors such as the project industry must have an effective control system to ensure proper optimum use of public funds when rendering public services. Therefore, the industry must create a working environment that respects and support project processes. This can be achieved by encouraging risk management to act against non-project employees and implement partnering recommendations on financial risk exposure, emphasising the importance of complying with control activities. Thus, emphasis on the importance of upholding project processes should include respecting the operations of partnering.

Furthermore, all employees should work as a unit to uphold the project process. This may be achieved by holding accountable all employees for non-project with control activities. If all employees from various designations are accountable for project processes, improvement to partnering operations will be enhanced through commitment and support of project processes by employees. Additionally, the construction sector must create an environment that motivates projects with control activities and focuses on finding solutions to non-project issues instead of blaming risk management and its assistants for non-projects.

6.5.1.2 Policymaking processes within the sector

Understanding the application of implemented industry risk management policies is crucial for the proper, optimal use of public funds. Thus, to ensure all employees understand the application of risk management policies, the construction must provide employees with appropriate training, direction, and supervision to enhance their knowledge and skills to apply such policies. To strengthen an understanding of financial management policies, the construction sector should consider having in place the following factors:

- Simplification: The written policies must be simplified using simple English to accommodate all employees, and the flowcharts may be used to display the flow of operations.
- Available: Ensure that these policies are available to all employees to always refer to when performing their respective duties.
- Understood: Application of policies is understood by all employees through policy training, workshops and regular team building activities.
- Relevant: Revised policies should be timeously communicated to all staff members, and training for the new policy should be provided.
- Implemented: All employees uphold the policies and procedures as it is required.

6.6 CONTRIBUTION TO KNOWLEDGE

Several industry agents exist within the construction sector, such as risk management and partnering. Construction should have precise project specifications that govern the working relationship between the risk management and project to minimise agency problems. Such projects must also allow the partnering to report to the highest authority within the construction sector, such as the level risk management unit reports to (head of the construction industry sector).

This is to strengthen the independence of the partnering role to ensure it prevents risk management from overriding project processes. Strengthening the independence of partnering would mean they would perform their work free from all conditions, which threatens the work to be performed unbiased. Furthermore, having the partnering reporting to the head of the industry will free it from risk management interferences with their decisions, thereby getting the freedom to exact projects with controls.

6.7 RECOMMENDATIONS

- Risk management should consider taking appropriate actions against non-project to strengthen project procedures.
- Provide employees with appropriate training, direction, and supervision to ensure they have the necessary knowledge and skills to carry out their duties; inform employees of the proper channels for reporting suspected improprieties.
- Risk management should commit itself to implementing recommendations from the partnering on the risk exposure that could hinder service delivery and should not interfere with the operations of the partnering function by giving them the freedom to execute their role without any influence.
- When construction develop policies should consult all employees, this helps to achieve effective policies and procedures. In addition, it is a greater motivation for employees to follow them.
- A lack of communication and poor relationships could occur within the parties in a project. In most instances, both general owners and functional contractors would be drawn from their company interests to balance each parent company's objectives.

6.8 CONCLUDING SUMMARY

In the Limpopo construction context, some contractors are mainly concerned about finishing the job soon, getting the money and quickly getting to the next job. However, a constructive relationship through partnering adds more work and too many responsibilities. As one-off projects dominate the construction industry, it would appear that project-specific partnering will likely take the leading role in promoting a closer relationship in construction projects.

In project partnering among parties, both the parties are normally working towards achieving each other’s goals and thereby outcomes and processes of achieving the outcomes will be very effective. However, the views of most respondents highlighted that in order for the project partnering concept to be more suitable and that its outcomes to be more effective, there must be effective communication. A lack of communication and poor relationships

could occur within the parties in a project. In most instances, both general owners and functional contractors would be drawn from their company interests to balance each parent company's objectives.

As per the outcomes of this research, the low level of risk management practice requires a more comprehensive review considering that most stakeholders are uncertain of the benefits of such practices. Therefore, proposing an impact risk management framework specific for Limpopo construction projects is still an area for research that needs to be pursued. Other areas for future research include evaluating risk management effectiveness in private donor projects and a risk management model for competitive public infrastructure delivery.

In the Limpopo construction context, some contractors are mainly concerned about finishing the job soon, getting the money and quickly getting to the next job. However, a constructive relationship through partnering adds more work and too many responsibilities. As one-off projects dominate the construction industry, it would appear that project-specific partnering will likely take the leading role in promoting a closer relationship in construction projects.

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Participant D. (2020). Interview with the researcher on 19 October, Vredenburg: WCC.

Participant E. (2020). Interview with the researcher on 18 October, Vredenburg: WCC.

Participant F. (2020). Interview with the researcher on 20 October, Vredenburg: WCC.

Participant G. (2020). Interview with the researcher on 16 October, Vredenburg: WCC.

Participant H. (2020). Interview with the researcher on 17 October, Vredenburg: WCC.

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APPENDICES

APPENDIX A: CPUT ETHICAL CLEARANCE

P.O. Box 1906 • Bellville 7535 South Africa •Tel: +27 21 4603291 • Email: fbmsethics@cput.ac.za
Symphony Road Bellville 7535

Office of the Chairperson Research Ethics Committee	**Faculty: BUSINESS AND MANAGEMENT SCIENCES**

At a meeting of the Faculty's Research Ethics Committee on **2 May 2018**, Ethics Approval was granted to **Puledi Phineas Mabe (217240224)** for research activities of **Master of Internal Auditing** at the University of the Cape Peninsula University of Technology.

Title of dissertation/thesis/project:	IMPACT OF PARTNERING ON RISK MANAGEMENT WITHIN CONTRUSCTION INDUSTRIAL SECTORS IN LIMPOPO Lead Researcher/Supervisor: Prof J Dubihlela

Comments:

Decision: APPROVED

Signed: Chairperson: Research Ethics Committee	**4 May 2018** **Date**

Clearance Certificate No | 2018FBREC527

APPENDIX B: PERMISSION LETTER FROM TCE TO CONDUCT RESEARCH

P.O. Box 2474, Polokwane, 0700 No. 33A, Bok Street, Polokwane,0700
Tel: (015) 295 8410 Fax:015 295 4322 Cell:071 184 9920

Our Ref: **TCE-2142**

Enq. K.M Luvhengo
E-mail: luvhengo2@gmail.com

I **Luvhengo Khathutshelo Meshack** am willing to help Puledi Phineas Mabe a master's student of cape Peninsula University of technology to collect data for his research. I will be available for contributing information within the civic field.

T.C Nemvumoni Pr. Eng 20060270 (Managing Member)
Tshedza Consulting Engineers

CESA

APPENDIX C: PERMISSION LETTER FROM CIVIL & BUILDING CONSTRUCTION TO CONDUCT RESEARCH

P.O.BOX 865
MUNGOMANI
0992

CONTACT PERSON: LUVHENGO K M
CELL: 071 184 9920
EMAIL: LUVHENGO2@GMAIL.COM
FAX: 086 759 4669

Ck No: 2014/243372/07

Dear Mr Mabe PP

Your officially granted a permission to gather information within our company and we are willing to offer any information you need for you to further your studies and career.

DATE 17/11/2017

SIGNATURE

. . . . . .

APPENDIX D: PERMISSION LETTER FROM MUTEO CONSULTING TO CONDUCT RESEARCH

MUTEO CONSULTING
Reg. No: 2003/056655/23

Branch Offices
Centurion, Gauteng
Mbombela, Mpumalanga
Pietermaritzburg, KwaZulu-Natal
Thohoyandou, Limpopo

Head Office
39 Grobler Street, Polokwane
P.O. Box 6196, Polokwane North, 0750
Tel: 015 291 4065, Fax: 015 291 4043
Web: www.muteo.co.za
E-mail: mail@muteo.co.za

Date: 30th November 2017 **Ref:MUTKB-001**

To Whom it may Concern

Re: Khondo Brave's Master's survey

I **Livhu Motabatsindi** is willing to participate on the study that you are compiling. I will be available for supplying information within the public domain.

Regards,

Livhu Motabatsindi
Quality Manager

APPENDIX E: PERMISSION LETTER FROM NYELETI TO CONDUCT RESEARCH

Tel: +27 15 297 7207
Fax: +27 15 297 8504
E-mail: smkhabele@nyeleti.co.za

Physical address:
25 Rhodesdrift Street,
Rhodesdrift Office Park
Bendor, Polokwane
0699
Postal address:
PO Box 695, Polokwane

Company registration: 1996/016230/07

Student number 217240224 you are welcome to work with our company for you Masters in Internal Auditing. We are willing to give you any data that you need.

Signature: Date:

APPENDIX F: PERMISSION LETTER FROM SFC ENGINEERING TO CONDUCT RESEARCH

Tel: 015 297 1045
Fax: 015 297 0784
Email: enos.mamabolo@sfce.co.za

DZB Building
25 Watermelon Street
Ground floor, Platinum Park
Bendor, Polokwane
P O Box 4879
0700

Date: 23 November 2017

To Mr Mabe PP

A student of Cape peninsula university of Technology a master's student. Research title: IMPACT OF PARTNERING ON RISK MANAGEMENT WITHIN CONTRUSCTION INDUSTRIAL SECTORS IN LIMPOPO

This is to confirm that I Mr Mamabolo ES director of the company I give Mabe Puledi Phineas a permission to pleat information from the company.

Thank you

Director

APPENDIX G: QUESTIONNAIRE

Impact of Partnering on Risk Management within Construction Industrial Sectors in Limpopo

Cape Peninsula Business College

PO Box 652

Cape Town, 8000

South Africa

Request for Delphi Feedback: Risk item measures

November 2017

Dear sir/madam

I, (Masters) student, am undertaking a research project intended to establish the relationship between risk and partnering in projects and thus allow integration of project partnering and risk management model. Therefore, I seek your permission to share approximately 10-15 minutes of your valuable time to complete the research questionnaire.

Explanatory notes:

Your participation in this study is entirely voluntary. Please do not provide your name or contact details.

All information given in this questionnaire will be kept strictly confidential and anonymous. Under no circumstances will other employees or your hotel have access to the information provided by you.

Your responses will be used in an aggregate form with other responses. However, at no time will your responses or your name be identified in any reports.

Please answer ALL questions even if you are not completely sure of your response.

Kindly return the questionnaire (if not using an online survey) in the postage-paid return envelope on or before 31 December 2017. Summary results of this research project will produce a master's thesis, which may appear in the Cape Peninsula University of Technology library and research articles in research journals and at conferences.

Should you have any queries regarding this survey, you are welcome to contact the research team.

Mr P. Mabe, Masters Student-FBMS

Prof J. Dubihlela (PhD), HOD Internal Auditing & FIS - School of Accounting Sciences

Cape Peninsula University of Technology Faculty of Business & Management Sciences

Cape Town, 8000 Cape Peninsula University of Technology

South African Cape Town, 8000

Tel: 015 460 6000 South Africa

Email: 217240224@mycput.ac.za Tel: +27(0)21 4603266

khondobrave@gmail.com +27(0)21 4603477

E-mail: dubihlelaj@cput.ac.za

Thank you for investing your time and effort in ensuring the future of your profession.

PLEASE ANSWER THE FOLLOWING QUESTIONS BY CROSSING (X) THE RELEVANT BLOCK OR WRITING DOWN YOUR ANSWER IN THE SPACE PROVIDED.

EXAMPLE of how to complete this questionnaire:

Your gender?

If you are female:

Male	**1**
Female	2

Section A: Background Information

This section of the questionnaire asks about your background or biographic information. Although we are aware of the sensitivity of the questions in this section, the information will allow us to groups of respondents. Once again, we assure you that your responses will remain anonymous. Your cooperation is appreciated.

Are you a:

Contractor? A. Yes ☐ B. No ☐

Sub-Contractor? C. Yes ☐ D. No ☐

Side Project Manager? E. Yes ☐ F. No ☐

Your province of work?

Eastern Cape	**1**
Free State	2
Gauteng Province	3
KwaZulu Natal Province	4
Limpopo Province	5
Mpumalanga Province	6
Northwest Province	7
Northern Cape Province	8
Western Cape Province	9

Gender

Male	**1**

Female	2

Age (in complete years)

30 years and younger	**1**
31 years to 40	2
41 years to 50	3
51 years to 60	4
61 years and older	5

Ethnicity

Black	**1**
White	2
Coloured	3
Indian or Asian	4

The department in which you currently work.

Contractor	**1**
Sub-Contractor	2
Joint Venture	3
Side Project Manager	5
Other: please specify (_____).	6

Your highest educational qualification?

Grade 11 or lower (Std 9 or lower)	**1**
Grade 12 (Matric, Std 10)	2
Post-Matric Diploma or Certificate	3
Baccalaureate Degree(s)	4
Post-Graduate Degree (s)	5

What is your marital status?

Single	**1**
Married with no children	2
Married with children	3
Divorced	4
Widow/Widower	5
Living together/co-habitant	6

Nationality/citizenship?

South African	**1**
Non-South African	2

Length of employment (total number of years) worked in the Construction industry?

Less than a year.	**1**
1 to 2 years.	2

2 to 5 years.	3
5 to 10 years.	4
10 years to 15 years.	5
15 to 20 years	6
More than 20 years	7

How many other Construction Industrial sectors have you worked at in the Construction industry before?

None	**1**
1 to 2	2
3 to 4	3
5 to 6	4
More than 6	5

I have worked for this construction

Less than a year.	**1**
1 to 2 years.	2
2 to 5 years.	3
5 to 10 years.	4
10 years to 15 years.	5
15 to 20 years	6
More than 20 years	7

SECTION B

Level of Project partnering assessment questionnaire

Please rate your and other project participants' performance in the partnering project

Questions		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
14.	Are your people able to define what business process is?	1	2	3	4	5
15.	Do you people understand the objective/purpose of various processes?	1	2	3	4	5
16.	Do your people understand what their responsibilities are in various processes?	1	2	3	4	5
17.	Are you people able to identify critical stage process?	1	2	3	4	5
18.	Do your people understand how one process integrates with another process?	1	2	3	4	5

Risk level assessment questionnaire

Questions		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
19.	Considerations relating to land claims influence how the project is conducted	1	2	3	4	5
20.	Does the organisation anticipate a shortage of available personnel with appropriate skills during a significant period of the project?	1	2	3	4	5

21.	The project team has previously worked together.	1	2	3	4	5
22.	Cost estimates are generated at the work-package level.	1	2	3	4	5
23.	Cost estimates are based on historical data or industry benchmarks	1	2	3	4	5
24.	The source of funds has been identified within all departmental levels.	1	2	3	4	5
25.	The funds have been internally committed.	1	2	3	4	5
26.	The project is susceptible to time delays.	1	2	3	4	5
27.	Geographical considerations influence how the project is conducted.	1	2	3	4	5
28.	Environmental considerations influence how the project is conducted	1	2	3	4	5
29.	There are socio-economic considerations that must be taken into Account.	1	2	3	4	5
30.	Public and community perceptions influence how the project is conducted.	1	2	3	4	5
31.	The project has an effective communications plan.	1	2	3	4	5
32.	The commitment of your organisation's senior executive management to the timely and successful completion of this project is extensive	1	2	3	4	5

Please feel free to comment on any key aspect(s) we may have missed which you believe is important.

_____

_____

_____

Thank you for your time and valuable input

APPENDIX I: EDITING CERTIFICATE

PROFESSIONAL EDITING SERVICES
Stand out for the Write reasons

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PhD

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Brantwood, Kuils River, 7580
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geralddu9@gmail.com

Certificate of Editing

This serves to confirm that copy-editing and proofreading services were rendered to

for a master's thesis entitled

IMPACT OF PARTNERING ON RISK MANAGEMENT WITHIN THE CONSTRUCTION INDUSTRIAL SECTOR IN LIMPOPO

By Puledi Phineas Mabe

with final word count of 30 283 on 22 November 2021

I am a member of the Professional Editors' Guild (member number DUP015) and commit to the following codes of practice (among others):

- *I have completed the work independently and did not sub-contract it out*
- *I kept to the agreed deadlines and/or communicated changes within reasonable time frames*
- *I treated all work as confidential and maintained objectivity in editing*
- *I did not accept work that could be considered unlawful, dishonest or contrary to public interest*

I uphold the following editing standards:

- *proofreading for mechanical errors such as spelling, punctuation, grammar*
- *copy-editing that includes commenting on, but not correcting, structure, organisation and logical flow of content, formatting (headings, page numbers, table of contents, etc.), eliminating unnecessary repetition*
- *checking citation style is correct, punctuating as needed and flagging missing or incorrect references*
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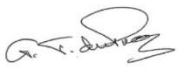
- *returning the document with track changes for the author to accept*

I confirm that I have met the above standards of editing and professional ethical practice. The content of the work edited remains that of the student. *Disclaimer: The correlation and synchronizing of the intext citations with the references is the responsibility of the student. The editor does not accept responsibility for any discrepancies in this area.*



Gerald T du Preez, PhD

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APPENDIX J: TURNIT-IN REPORT

IMPACT OF PARTNERING ON RISK MANAGEMENT WITHIN THE CONSTRUCTION INDUSTRIAL SECTOR IN LIMPOPO

ORIGINALITY REPORT

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