



**Assessing Project Maturity Level in Botswana
Railways**

**Thabo Gabanamotse
29893259**

ORCID: 0000-0002-7811-4345

**Research proposal for the dissertation submitted in
partial fulfilment of the requirements for the degree
in Master of Business Administration at the Mafikeng
Campus of the North-West University**

Supervisor: Professor Jan Meyer

Date of submission: 23 November 2018

ABSTRACT

Efficiency and effectiveness of project management is critical to the execution of projects within an organization. In the current ever-changing environment, organizations have come to employ project management as a critical tool to outperform their competitors. The maturity of its project management has to be determined since it is directly correlated with project management excellence, retaining projects and getting a return on investment.

The main objective of this study was to assess project management maturity level of Botswana Railways (BR). The study focused on the business units and subsidiary companies responsible for project management in the organization. It therefore investigated the research variables critical to the project management capability areas used to determine the project management maturity of an organization. The researcher evaluated various internationally adopted project management maturity models after an extensive literature review. A project management matrix developed by the Office of Government (UK) was used as benchmarking tool to determine the maturity level of BR.

The maturity level of BR was found to be at on the second level of the maturity ladder (*Level 2: "Planned"*). The study subsequently details what it means to be at this level. The results of the data analysis indicated that BR has the opportunity to improve project management maturity and a number of recommendations are made in this regard.

DECLARATION

I declare that this research report is my own, unaided work. It is submitted in partial fulfilment of the requirements of the degree of Master of Business Administration for the North-West University. It has not been submitted before for any degree or examination in any other university.

.....

Date:

Thabo Gabanamotse

ACKNOWLEDGEMENTS

This research paper concludes a two-year journey during which I studied towards a Masters of Business Administration with North-West University. On achieving this, I wish to acknowledge the following:

- I am grateful to all the Professors of the Business school who provided knowledge on all aspects of the business environment, the competent business school administration and fellow students. I am confident to say I have been trained and I am ready to assume an executive leadership position.
- I wish to acknowledge my research supervisor, Prof. Jan Meyer, for the unending support throughout the research period.
- Empirical research proved to be more difficult than I expected. Approximately 50 individuals were requested to participate in the survey and I would like to express my gratitude to all those who have contributed data to this study, but whom I cannot name here for confidentiality reasons.
- I would like to give thanks to my Manager, Batlhabane Medupe for giving me enough time and words of encouragement throughout my studies, and also my Research Assistant Onkemetse Gabalotegwe for her support during the research period.
- I would like to thank my lovely wife, Katso, and my beautiful children, Motheo and Loapi, for the support, motivation and understanding when it was most needed. They sacrificed a lot to allow me to spend time away from home and granted me the financial resources for this programme.
- Lastly, I wish to give thanks to my holy divine God for the inspiration and gift of life.

TABLE OF CONTENTS

| | |
|--|-----|
| ABSTRACT..... | II |
| DECLARATION | III |
| ACKNOWLEDGEMENTS | IV |
| LIST OF TABLES | XI |
| LIST OF FIURES..... | XII |
| ABBREVIATIONS | XIV |
| | |
| CHAPTER 1: INTRODUCTION | 1 |
| 1.1 Background | 1 |
| 1.2 Botswana Railways | 2 |
| 1.3 Problem statement | 4 |
| 1.4 Research question | 5 |
| 1.5 Aim and objectives of the study..... | 5 |
| 1.6 Scope of the study | 6 |
| 1.7 Research methodology..... | 6 |
| 1.8 Constraints of the study | 7 |
| 1.9 Outline of the dissertation | 8 |
| 1.10 Summary | 9 |
| | |
| CHAPTER 2: LITERATURE REVIEW | 10 |

| | | |
|--------|---|----|
| 2.1 | Introduction | 10 |
| 2.2 | Project management | 10 |
| 2.3 | Project-oriented organizations..... | 12 |
| 2.4 | Strategic emphasis on projects | 20 |
| 2.5 | Excellence in project management..... | 23 |
| 2.6 | Integrated processes | 24 |
| 2.7 | Culture..... | 25 |
| 2.8 | Management support | 26 |
| 2.9 | Training and education | 26 |
| 2.10 | Informal project management | 27 |
| 2.11 | Behavioural excellence..... | 27 |
| 2.12 | Summary | 28 |
| 2.13 | Concept of project maturity..... | 28 |
| 2.14 | Evolution of project management maturity models | 32 |
| 2.14.1 | Organizational project management maturity model (OPM3)..... | 33 |
| 2.14.2 | Portfolio, programme and project management maturity model (P3M3)..... | 39 |
| 2.15 | Research Variables | 42 |
| 2.15.1 | Process, Standards, Methods & Procedures (according to 10 PMI knowledge areas)..... | 42 |
| 2.15.2 | Knowledge Management | 45 |

| | | |
|--|---|------------------------------|
| 2.15.3 | Technology management | 45 |
| 2.15.4 | Decision support management | 45 |
| 2.15.5 | Continuous process development..... | 45 |
| 2.15.6 | Portfolio resource management..... | 47 |
| 2.15.7 | Professional development management..... | 47 |
| 2.15.8 | Summary of variables | Error! Bookmark not defined. |
| 2.16 | Summary maturity models (OPM3 & P3M3) | 47 |
| 2.17 | Capability areas to improve project maturity..... | 48 |
| 2.18 | Summary | 50 |
| CHAPTER 3: RESEARCH METHODOLOGY | | 52 |
| 3.1 | Introduction | 52 |
| 3.2 | Research Approach and Design | 52 |
| 3.3 | Study Context | 53 |
| 3.4 | Population and Sample Study..... | 53 |
| 3.4.1 | Sampling Criteria..... | 54 |
| 3.4.1 | Inclusion Criteria | 56 |
| 3.4.1 | Exclusion Criteria | 56 |
| 3.5 | Data collection strategies | 56 |
| 3.6 | Pretesting the questionnaire | 59 |
| 3.7 | Ethical considerations | 59 |

| | | |
|---|--|-----------|
| 3.8 | Data analysis | 60 |
| 3.9 | Summary | 60 |
| CHAPTER 4: RESEARCH RESULTS..... | | 61 |
| 4.1 | Introduction | 61 |
| 4.2 | CHAPTER SUMMARY..... | 68 |
| CHAPTER 5: RESEARCH ANALYSIS..... | | 69 |
| 5.1 | Introduction | 69 |
| 5.2 | Analysis of self-administered research questionnaires | 69 |
| 5.2.1 | Knowledge Management | 70 |
| 5.2.2 | Process Standards, Methods and Standards | 70 |
| 5.2.3 | Technology Management Capability Area | 72 |
| 5.2.4 | Decision Support Capability Area..... | 72 |
| 5.2.5 | Portfolio Resource Management Capability Area..... | 72 |
| 5.2.6 | Professional Development Management Capability Area..... | 72 |
| 5.2.7 | Continuous Process Improvement Capability Areas | 73 |
| 5.2.8 | Overall Organizational Project Management Maturity Level | 73 |
| 5.3 | Summary | 74 |
| CHAPTER 6: CONCLUSION AND RECOMMENDATIONS..... | | 76 |
| 6.1 | Introduction | 76 |

| | | |
|--------------|---|-----------|
| 6.2 | Conclusions..... | 76 |
| 6.2.1 | The Maturity Level of Botswana Railways | 76 |
| 6.2.2 | Knowledge Management | 77 |
| 6.2.3 | Process Standards, Methods and Standards | 77 |
| 6.2.4 | Technology Management or Project Management Systems | 77 |
| 6.2.5 | Decision Support..... | 77 |
| 6.2.6 | Portfolio Resource Management..... | 77 |
| 6.2.7 | Professional Development | 78 |
| 6.2.8 | Continuous Improvement | 78 |
| 6.2.9 | Best Practices Summary | 78 |
| 6.3 | Recommendations | 79 |
| 6.3.1 | Knowledge Management: The Organization should Build a <i>Project Management Centre of Excellence</i> | 80 |
| 6.3.2 | Process Standards, Methods and Procedures | 80 |
| 6.3.3 | Project Management Information Systems | 80 |
| 6.3.4 | Decision Support..... | 81 |
| 6.3.5 | Portfolio Resource Management..... | 81 |
| 6.3.6 | Continuous Improvement | 82 |
| 6.3.7 | Professional Development | 82 |
| 6.4 | Conclusion..... | 83 |
| 6.5 | Recommendations for future research studies | 83 |

| | |
|--|------------|
| BIBLIOGRAPHY | 83 |
| ANNEXURES | 88 |
| ANNEXURE A: DATA COLLECTION TOOL | 88 |
| ANNEXURE B: PROJECT MANAGEMENT MATURITY MODEL | 107 |
| ANNEXURE C: MATURITY LEVEL DESCRIPTIONS..... | 119 |
| ANNEXURE D: INFORMED CONSENT | 120 |
| ANNEXURE E: RECRUITMENT MATERIAL | 127 |

LIST OF TABLES

Table 2.1: Key project management Processes (Kwak & Ibbs, 2000) 32

Table 2.2: The Structural Components that Comprise the P3M3 Model 41

Table 2.3: Comparison of OPM3 & P3M3 48

**Table 2.4: Capability areas improving project management maturity level
(Kerzner, 2000:33)..... 49**

Table 2.5: Sample elements distribution 55

Table 4.1: Average Research Variables project management Maturity Level ... 67

LIST OF FIGURES

Figure 2.1: Strategy, Structure and Culture of the POO 15

Figure 2.2: Specific Processes of the POO..... 16

Figure 2.3: Project management process 17

Figure 2.4: Programme organization chart 18

Figure 2.5: Project management in a complex environment 20

Figure 2.6: The six components of excellence. 24

Figure 2.7: Integrated processes for the 20 first century..... 25

Figure 2.8: Proposed Excellent Performance Framework (Tobin, 2004) 30

Figure 2.9: The Organizational Project Management Maturity Model (OPM3) 36

Figure 2.10: Three General Elements of the OPM3 Standard 37

Figure 2.11: IPECC dimension – 5 Process Groups..... 38

Figure 2.12: OPM3’s Multi-Dimension Level of Maturity..... 39

Figure 2.13: PMI Project Maturity Model (Green, 2006) 44

Figure 4.1: BR group Structure Participants bar chart analysis 61

Figure 4.2: Participants Analysis by Location 62

Figure 4.3: Roles in Projects Chart Analysis 63

Figure 4.4: Participants Educational Background..... 64

Figure 4.5: Participants Areas of Specialization..... 65

Figure 4.6: Value of Projects Participants Handles 65

Figure 4.7: Number of Projects Participants Handles 66

Figure 6.1: Characteristics of the maturity levels 76

ABBREVIATIONS

BR; Botswana Railways

CMM; Capability Maturity Model

IPECC; Initiating, Planning, Executing, Controlling and Closure

KM; Knowledge Management

OGC; Office of Government Commerce

OPM3; Organisational Project Management Maturity Model

P3M; Portfolio, Programme and Project Management

P3M3; Portfolio, Programme and Project Management Maturity Model

PM; Project Management

PM3'S; Project Management Maturity Model

PMBOK; Project Management Body of Knowledge

PMI; Project Management Institute

PMM; Project Management Maturity

POO; Project Oriented Organisation

PPP; Public Private Partnership

SEI; Software Engineering Institute

SW-MM; Software Capability Maturity Model

TQM; Total Quality Management

WBS; Work Breakdown Structure

CHAPTER 1: INTRODUCTION

1.1 Background

The purpose of this research was to evaluate the degree of project management maturity at Botswana Railways (BR). The research focuses on all the business units responsible for project management within the organization to - identify the maturity level of the organization's project management. The study pays special attention to the most common reasons for failures, challenges and success in BR projects.

In order to accomplish the objective of this study there is need to examine the theory and the literature on Project Management that specialize in the subsequent scope of study: project management within BR, and valuation of organizational project management maturity and competence in project-focused organizations.

Corporate organizations are facing immense competitive pressures today and find it hard to enter into the new markets. Technology is ever developing, organizations are metameric and specialists are redistributed. Hence, several firms are forming strategic coalitions, through mergers and acquisitions, to share their acquaintance and resources to provide and deliver top quality product or services. In today's time-based industrial atmosphere, project-driven structure type appears to be enticing (Kwak & Ibbs, 1995).

According to Cooke-Davies and Arzymanow (2003), modern PM originates from the Second World War and advanced in an inadequate integer of engineering-based businesses during the 1950s until the 1970s. As from the 1990s, the need for project managers has expanded, therefore project management has grown intensely in a broad range of industries.

Regardless of the extensive usage of Project Management tools and practices transversely through dissimilar businesses, organizations are often disordered, unreliable, and have difficulty locating their existing application of PM (Kwak & Ibbs, 2002). Most companies consider PM as a tactical tool to respond to this ever-revolutionary environment to outdo their competitors. However, their PM maturity level and strategies to improve is not always known.

As stated by Peters (1999), “In the new economy, all work is project work”, “our organizational world is no longer a pattern of jobs. Nowadays organization is promptly converted from an edifice put together out of jobs to a field of exertion demanding to be completed” (Bridges, 1993). Therefore, many corporations are managing projects to thrive in this modern world. Project management has led to more operative and proficient dissemination of products and services, more precise planning and forecasting, value-added output, developed customer relations and augmented earnings (Schlichter, 1999).

1.2 Botswana Railways

BR is a commercial arm of the government of Botswana, established in terms of Section 3 of Botswana Railways Act (CAP70:01). The organization has a mandate to run a safe and cost-effective rail transport system and falls under the Ministry of Transport and Communications. BR has a peculiar position in that while it was set up as an independent commercial enterprise of the government, it has reserved its identity as a department of the government. It is an amalgamation between a parastatal and a government section. The Botswana Railways Act (1986) was amended in July 2004 to diversify its business streams so that it can now form joint ventures, partnerships, start subsidiary companies and raise finance from domestic capital markets.

BR continues to present innovative products and services as one of its strategies to remain competitive and unceasingly tries to improve business management. They aim to meet customer needs and to keep up with changing railroad and transport logistics technologies. Speeding up the advancement new products and services will support BR in retaining profits and making the enterprise sustainable. The survival of the organization is made possible by the introduction of projects that aim to respond to initial mover advantage, addressing customer needs rapidly, and answering back to competitors’ offering in the shortest period possible to refute competitor’s points of difference.

Competitive, technological, economic, political, demographic, legal, cultural and ecological forces create challenges and prospects for organizations. The organization should constantly acclimatize if they want to succeed. BR has developed from the

turnaround strategy in 2006 to the recent corporate strategy of 2018–2023 with the aim to return the organization to profitability and regain its credibility. The strategies included a portfolio of projects running in billions of Pula's and despite these huge investments, the organization is still running on losses.

Every organization's interrogations include; "Are we achieving the results we desire?"; "Are we meeting the objectives of our project?"; "Are we meeting our customer's success criteria?", besides "Are we achieving our desired return on investment?" (Florac *et al.*, 1997:1).

Can the Project Manager find out if projects are truly adding value to the achievement and organization's corporate growth? The assessment of project management development can create the foundation to assess growth in order to gain world class in project management prominence (Levin & Skulmoski, 2000:1).

The analysis objective is to seek out a decisive answer to answer the research interrogations by means of maturity model to appraise and measure the current level of the structure project management maturity (PMM) of BR.

Rendering to Nokes and Kelly (2007:153 – 156), there is extraordinary association amongst the success of projects and project management effectiveness. The efficacy of project management affects successful delivery of the project. Therefore, successful delivery of projects could result into positive impact in project value creation, timeline, cost and quality of the delivered product/service. The researcher believes the effectiveness of Botswana Railways project management can be determined through conducting a project management maturity assessment by using a tailor made model. The model will reveal the level of project management maturity and key improvement areas will be identified which requires management intervention.

The process described above could result in the organization improving its project management performance and finally building a philosophy of project management superiority. The findings of the research will be of great value to BR, as it will lead project managers towards setting goals and prioritizing the areas that require improvement.

By analysing the data from the questionnaire, the researcher was to measure BR project maturity level against the key four project attributes. A gap analysis from the findings offered a road map for excellence in BR project management.

1.3 Problem statement

Project management maturity valuation may be a manner of recognizing this need by processing the up to date condition of project management and giving regulated track for enhancement leading to superiority. The delivered projects should meet the intended project objectives or value creation under the constrictions of time, cost and quality. Botswana Railways has been over the years implementing strategies to address key results areas as identified from the turnaround strategy 2006 – 2011 and corporate strategy 2012 – 2017. The strategies consisted of initiatives and portfolio of projects running in billions of Pula's. These projects are expected to have positive impact towards improved revenue generated, tonnage moved and the profitability of the organization. It is unfortunate that over the years the organization has been recording losses, the tonnage moved and revenue generated continues to decline over the years.

The researcher assumes that project delivery in general has a direct correlation with the level of project management maturity of the company. A project management maturity model (PMMM) could serve as the basis for attaining excellence in project management (Crawford, 2002). According to Kerzner (2006:57), maturity is a requirement for achieving excellence. Investigating project management maturity level can help with a gap analysis, leading to a road map of excellence. The researcher believes the current BR project management maturity level should be measured to identify areas that need improvement so that the organization can deliver projects that meets the requirements of project management. According to Project Management Body Of Knowledge, there are ten (10) project management knowledge areas that define project constraints. The organization with effective project management should implement its project in accordance to project management knowledge areas.

Project maturity mode used to measure BR project management maturity includes seven variables, namely Knowledge management, Process, Standards, Methods & procedures (according to 10 PMI knowledge areas), Decision support, Technology

usage, Professional development, Portfolio & resource management, and Constant process improvement dimensions. Research assessed and evaluated the level of maturity of these variables. The assessment of these variables offers a good understanding of project maturity of different aspects of the organization.

1.4 Research question

Research questions utilized in the investigation is geared towards addressing the aims and objectives this research endeavour. The research focus on the ensuing fundamental empirical question:

What is the organizational project management maturity level of BR?

Sub-question that support the main research questions are:

- What is the capability path required for project management to achieve higher organizational project management maturity level?

1.5 Aim and objectives of the study

The study aims to measure and evaluate the degree of project measurement maturity in BR and identifies opportunities for project management excellence. The research analysed various project management maturity models and determined the preeminent option for use to measure the organization's maturity level. The researcher also investigated the measures needed if the organization project management maturity level is low. The following are objectives of the research study:

- To review the literature on several project management maturity models (PMMMs).
- To select and tailor PMMMs as a tool to measure BR project management maturity level;
- To determine the degree of organizational project management maturity level comparative to a body of recognized best practices and competencies;
- To investigate each research variable to determine how they affect project management;

- To recognize the gaps that keep BR from attaining project management success.

1.6 Scope of the study

The research scope helps to identify the steps to be taken throughout the research study. The scope is to:

- Carry out an in-depth literature review related to a project management maturity measurement model, survey questionnaire design and research variables. The literature review presented an overview of relevant academic theories to the various areas applicable to this research study and provided the basis to develop a project management maturity measurement model for this investigation.
- Analyse how project management is executed in BR. The investigation considered the available knowledge, abilities, tools and techniques. The purpose of this was to provide insight on how projects are managed in BR.
- Develop a planned project management maturity measurement ideal for use to measure project management maturity level and evaluating project management efficiency at BR.
- Develop customized survey questionnaire that will be used as a measuring tool for project management maturity level.
- Analyse and interpret the data collected to reach findings with necessary recommendations for improvement.

1.7 Research methodology

The researcher used quantitative methods. The quantitative method was used to analyse the general effectiveness of project management in BR. Customized survey questionnaires were developed and used as a measuring tool to measure project management maturity level. The survey became successful based on the theoretic outline represented in the questions. A Likert scale will be used where all declarations, are presumed to acquire the same weight. A measure of five varieties, alternating from One(1) to Five(5) which will measure the project management maturity level which the participants will respond to the questionnaire. When

answering, the participants were asked to contemplate about all the projects that they have been involved with. The questionnaire aimed to measure project management variables in relation to project management maturity level. The results gathered from the quantitative research produced tangible measurable statistics that could be used for future benchmarking and continuous improvement.

Once the quantitative research had been completed, the collected data were analysed and interpreted to provide BR with a recommendation for improvement opportunities. By means of qualitative study, the investigator was able to improve personal relations with the targeted investigation partakers to collect the primary data from participants with hands-on familiarity on BR project management. They have valuable ideas for refining the BR project management.

1.8 Constraints of the study

The reliability of the research was affected by the following aspects (Crawford, 2007:18; Zikmund, 2003:392):

- The questionnaire and interview outcomes could be imprecise; as some of the respondents may not have been comfortable disclosing adverse data to the investigator.
- Information collected from the valuation of the Project Management Maturity (PMM) level may possibly not be correct as some respondents may be gauged the organisation to advanced level of maturity, and some respondents may be disinclined towards acknowledging the febleness of the organization.
- Reliability of outcomes may be exaggerated by the way investigators carry out interviews, as the investigator may involuntarily lead participant's feedback.
- Other respondents can be personal towards some interrogations, as they may have experienced foiling concerning the topic discussed.
- Some respondents were not available to carry out the survey, decreasing the number of participants.

1.9 Outline of the dissertation

The research comprises six (6) sections or chapters and including the appendices section. The following is the structure of the research:

Chapter 2: Literature Review

Academic philosophy, practice and application of project management in organisations as well as various maturity models. The section assesses concepts and practices of project management maturity and the importance of applying maturity models. Mutual maturity models are reviewed.

Chapter 3: Research Methodology

Research methods used by the investigator are classified in this section. The values of the different research methods and their strengths and weaknesses were clarified. They can validate the investigator's selection of the case approach for this study. The subdivision can give details concerning the analysis proposal or style and tools utilized to collect the specified information.

Chapter 4: Research Results

The outcomes of the investigation and findings are presented in this section.

Chapter 5: Research Analysis

Findings and outcomes are evaluated and placed into perception within this section. Probable causes for the gaps will be indicated. Entire analysis objectives and queries are thought-about and tested in this section.

Chapter 6: Conclusions and Recommendations

This section entices conclusions grounded on the outcomes drawn in preceding sections and particular commendations to realize the company's succeeding level

of project management maturity. During this chapter recommendations for more research are correspondingly itemized.

Appendices

Appendices can embrace the raw information of the maturity ideal valuation outcomes, dialogues (interviews) and manuscript assessments. It additionally includes of the investigation tools utilized to assemble all the data.

1.10 Summary

Organizations always talk about tactical planning, investment review, resource budgeting, new product development, organizational modification, mergers and acquisitions, subcontracting etc. In fact, they talk about ingenuity that transforms into and is implemented via projects. The organization's top and senior managers ought to comprehend that project management is a key tactical tool to determine these initiatives and to obtain maximum commercial benefits. Companies that excel in project management will undoubtedly outperform their competitors. Therefore, to have excellence in project management, BR must evaluate and analyse its project management maturity level. The main objective of this research was to measure then appraise gradation of project measurement maturity level in BR and to identify gaps that will result in project management excellence.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This section reviews the literature and investigates the correlation amongst the effective and efficient delivery of strategic projects management with the company's maturity level of project management. The aim of the literature review is to gain insight into existing maturing models to help us derive the relevant model of this research. Research variables or constraints is also discussed to lay a benchmarking platform for the proposed project management maturity measurement model. The literature explores the strategies a company can adopt to improve its project maturity level. This chapter starts by getting an overview of the term project management, various best practice project management methodologies, concept of project maturity and the suitable project management maturity model to utilize on this research. The research strongly believes the success project management correlates with the company's project management maturity level. A brief discussion with regard to the design of questionnaire that was used as a tool to measure the project management maturity level of BR is also presented.

2.2 Project management

“What is a project? Over the ages, humankind has embarked on many diverse projects. Ancient projects usually comprised of edifice and resulted in structures such as the pyramids, the Great Wall of China and cathedrals in Europe. In recent times, man continued to construct physical structures such as buildings, roads, bridges and railway systems, and established a massive range of products such as motor cars, and even commenced space travel. All the activities involved projects” (Steyn *et al.*, 2013: para 2).

Rendering to Steyn *et al.* (2013: para 1), “a project is any prearranged, transitory work embarked on to create exceptional, high quality product, service or other complete and certain effect (outcome or deliverable) within a limited time scale with scarce resources”. PMI (Project Management Institute) denotes a project as:

“A temporary endeavour undertaken to create a unique product, service or result” (Steyn *et al.*, 2013: para 2).

Temporary means that all projects have a certain beginning and a certain culmination. The end is reached when the aims of the project have been accomplished, or when it turns out that project purposes are not going to be met, and it will be prematurely closed.

A project does something that has never been done before and which is, therefore, inimitable. A product or service rendered may be exceptional. According to the PMBOK guide, the existence of monotonous fundamentals does not change the essential distinctiveness of the overall exertion.

Project management is considered the fastest growing form of management in the world. The companies who implement projects have to respond to the following factors (Steyn *et al.*, 2013: para 3);

- Globalization forces companies to operate as efficient as their counterparts overseas.
- Unlike decades ago, when products were made to last, modern products like cell phones have short product life cycles. New models are developed at an increasing pace.
- Customers are becoming more demanding and, because of severe competition, they can afford to be demanding. Sound project management guarantees client gratification.
- There is an eruption for knowledge available and much of the new knowledge is available through Internet. As rivals utilize this knowledge, companies are under pressure to make fast and drastic changes.
- The government's intention to deliver to communities leads to several projects.
- The organization to effectively deliver the projects, it must have sound project management processes which is in line with the best practice. The role of management is often defined as organisational planning, organizing, leading and control. Project management entices severely on general management and utilizes many of the philosophies of overall management. Nevertheless, project management varies from general and other types of management to consent attention on budget, quality and schedule of the deliverables, to deal

with intricacy essential to projects and to provide the flexibility obligatory to the projects.

World best project management practices? does not solitary require the utilization of the dominant tools and systems that have been advanced. It needs a self-controlled, autonomous team and first-rate leadership on the part of the project manager.

According to Prince2 (2009:4), “project management is the planning, delegating, monitoring and control of all phases of the project, and the inspiration of those included, to attain the aim of the project within the anticipated performance targets for time, cost, quality, scope, benefits and risks”.

A significant alteration amongst project management and other methods of management is that a project has a clear commencement and completion that requires project instigation, execution, control, monitoring and project closure. It may be decided that whilst the origin of project management is the direction of a project through life cycle, Project Management Institute (2003) provides the subsequent varied description:

“Project management is the application of knowledge, skills, and tools to project activities to meet stakeholders’ needs and expectations from a project”.

Nevertheless, APM, (2006) describes project management as follows:

“The process, by which projects are defined, planned, monitored, controlled and delivered so that agreed benefits are realized.”

Project management is recognized through applying and combining PM processes of monitoring, governing, executing, initiating and closing (Project Management Institute Inc, 2006).

2.3 Project-oriented organizations

Currently within the structure sphere, there's a superficial tendency to subcontract numerous roles and project management contribute to this functions (Baranskaya, 2007). Through that project management is executed within the organizations there

are four main teams of associations and they are classified into the subsequent spheres:

- Variations in numerous scopes of life;
- Variations within the governmental body structure;
- Public Private Partnerships (PPP's); and
- Project-oriented sectors of economy.

Nevertheless, during this research study the main target is on project orientated branches of economy because it relates to however Botswana Railways is implementing its project management principles.

In the new economy, all work is project work; our organizational world is no longer a pattern of jobs. "Today's organization is rapidly being transformed from a structure built out of jobs to a field of 'work needing to be done'" (Peters, 1999). Accordingly, several organizations are turning to management by projects succeed in this competitive world. In some organizations, project management has crystal rectifier to more practical and economical delivery of merchandise and services, additional correct budgeting and planning, improved productivity, improved client relationships and exaggerated profits (Schlichter, 1999).

The field of project management has expanded its emphasis from study of a single project to the way the organization utilises projects to attain its strategic objectives. Gareis (1989) defined the Project-Oriented Organization (POO) theory a long time ago. Precisely, (Gareis, 2000) advanced a maturity model that asses the maturity of proficiencies obligatory of a project-oriented organization.

Gareis (1989) emphasized that the detailed characteristics of such an organization are recognized in ways distinct projects are supervised and accomplished; together with ways in which management system of interior and exterior projects are enforced including ways in which they nurture correlation amongst the organisation and therefore execution of particular projects, (Anderson & Jessen ,2003: 458) oppose that these days projects are perceived as way other than simply resolution procedural malfunctions; projects are potentialities for understanding business environment and

modification. The word project maturity is employed as an indication or dimension of the organization's capability to develop comes for various functions.

"There is no mostly agreed description of what a mature project-based organization appears like. Different maturity ideal exemplifies both different sentiments and different propositions as to the way to attain maturity" (Cooke-Davies, Schlichter & Bredillet, 2001). However, Schleicher (1999) defines maturity as follows:

"Full development or a perfected condition that connotes understanding or visibility as to why success occurs and ways to prevent common problems".

Organizational maturity indicates that competencies must be developed over time. In terms of project management, this transmits to abilities that can yield repeatable achievement in project management (Schlichter, 1999). Levin and Skulmoski (2000) contend that the success of an organization is reliant on being able to make forecasts and obligations relative to their services and products, becoming very relevant. Thus, proficiency or maturity in project management is of interest to PM specialists.

Conferring to Gareis and Huemann (2000:709-721), so as for a company to be nominative as a Project-Oriented Organization (POO) it desires a considerable maturity level in project management; a company ought to have the subsequent features:

- describes "Management by Projects" as an organizational tactic;
- applies impermanent organizations for the performance of advanced processes;
- bring about a project portfolio of numerous project types;
- has specific perpetual organizations to offer integrative functions;
- applies a "New Management Paradigm" (lean management, total quality management (TQM), business progression re-engineering and learning organization);
- Contains clear project management philosophy; and
- Distinguishes itself as project-oriented.

Centred on the above seven (7) features, it is imperative that a project-oriented organization (POO) must contemplate projects as tools to complete advanced

procedures and as tactical preferences for organizational design as shown in Figure 2-1.

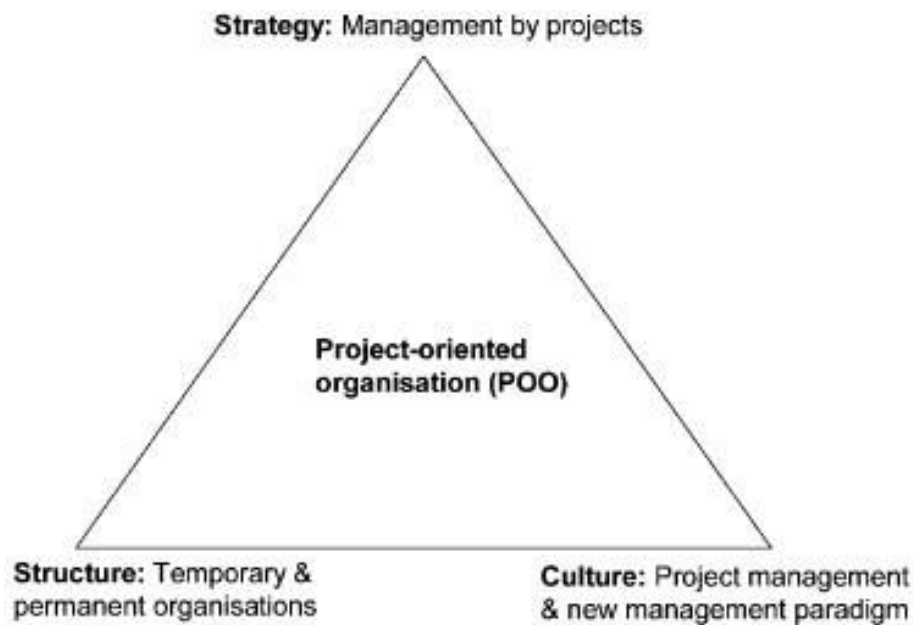


Figure 2.1: Strategy, Structure and Culture of the POO

Source: Gareis and Huemann (2000).

Specific business processes characterize the Project-Oriented Organization. The process ideal of the POO are often envisaged in an exceedingly a spider net as signposted in Figure 2.2 below. The axes signify the particular procedures of the POO.

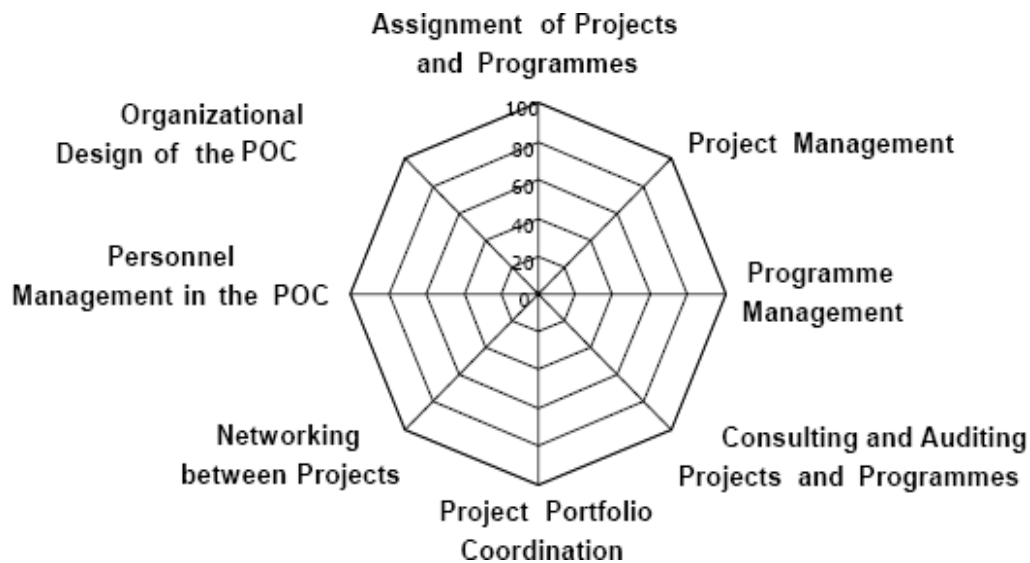


Figure 2.2: Specific Processes of the POC

Source: Gareis and Huemann (2000).

Gareis and Huemann (2000: 709-721) outline the transitory description of the particular procedures of the POC, as demonstrated within the spider net in Figure 2-2: above, in the subsequent items.

Project management is the basic business method of the POC. The procedure of project management commences with official project obligation and ends with project recognition by the project holder. The project management entails of the sub-procedures such as project controlling, project commencement, project separation management, project co-ordination, and project closure. Procedures are indicated in Figure 2-3. The project management procedure is executed additionally to the contents correlated procedures to attain the project outcomes. The examples for contents correlated procedures of associate engineering project are engineering, procurement, logistics, and edifice.

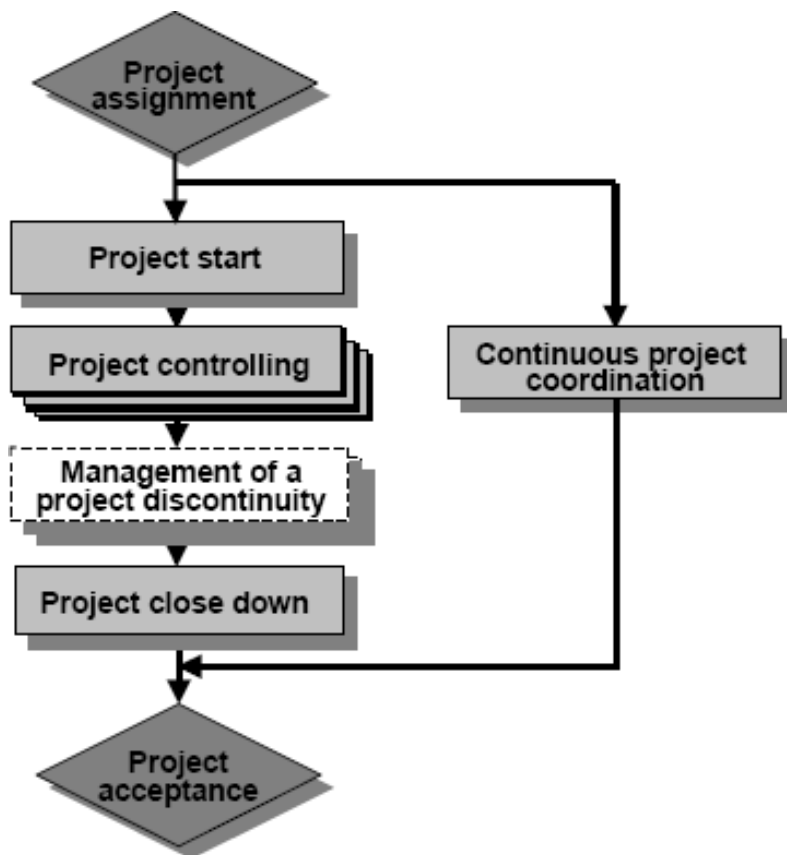


Figure 2.3: Project management process

Source: Gareis and Huemann (2000).

Gareis and Huemann (2000:709-721) contend that the “features to consider as part of the project management practices are as follows: the project aim, scope of work, project schedule and the project costs, including project organization, project philosophy, and project framework”. The project context involves the project environment relationships, project sustainability, its association to organizational tactics and other projects, etc. The attainable deliverables of every project management sub-process may be associated with resource necessities for the enactment of the project management sub-process.

Programme management should be executed to manage particular projects of a programme. Programme management approaches are similar to project management approaches, i.e. there is a programme work breakdown structure, environment investigation, bar chart, etc. The programme organization should be premeditated to the organizational outline of particular projects. Particular characters/roles in a

programme consist of Programme holder, Programme Manager and Programme Office. This is presented in Figure 2.4.

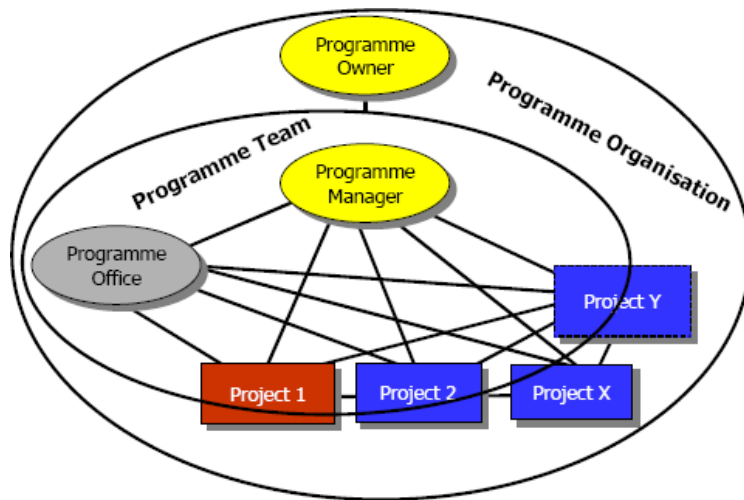


Figure 2.4: Programme organization chart

Source: Gareis (2000).

Gareis (2000) is of the view that the advantages of designing programme organization, as an alternative of describing “mega-project” by way of numerous sub-projects are as follows:

- a less ranked organization;
- distinct structures and a clear expression (a programme director and some project directors as an alternative of one project director and ‘project directors’ of the sub-projects);
- enabling projects of the programme by consenting specific project values, precise affiliations to environments, precise project organizations, etc.;
- difference among programme possession and completely different ownerships for the projects.

Gareis (2000) reveals that accessing and reviewing of projects and programmes are significant mechanisms to guarantee project and programme superiority. Aims of the project assortment/portfolio coordination include:

- enhancing the outcomes of the project portfolio (and not of the distinct projects),
- selecting ventures that are to be commenced,
- description of project primacies,
- coordinating interior and exterior resources, and
- Institute of erudition of and amongst projects.

Gareis (2000) emphasise that the foundation for the coordination of the project assortment is also a project portfolio information, that consents advance of project portfolio statements. Distinctive project portfolio reports comprise of the chart of projects, project profit versus risk graph, and advancement chart of projects, etc.

Personnel management procedures in the POO encompass recruitment, temperament and improvement of project workforces. Roles of project manager, project manager and senior project manager are found in a project management career path in the POO (Gareis, 2000).

Referring to Gareis and Huemann (2000:14-25) “management by projects” is the organizational tactic of corporations dealing with a progressively advance business atmosphere. A number of forces initiated from the project itself affects this environment. The organization subsidizing the project and organizations included in project execution, the segment pertinent to the product and services subsequent from the project. Services from the republic/economy and services coming from the world environment on economics, legislation and other social significances as specified in Figure 1.6. By means of applying management by projects, Rwelamila (2007) contend that the organization will be capable to cruise through the forces shown in Figure 2.5 and pursue the following aims:

- Organizational distinction as well as devolution of management obligation;
- Quality/value design, management and reassurance by project synergy and complete project designations;
- Goal alignment and employee development; and
- Organization of organizational erudition by projects.

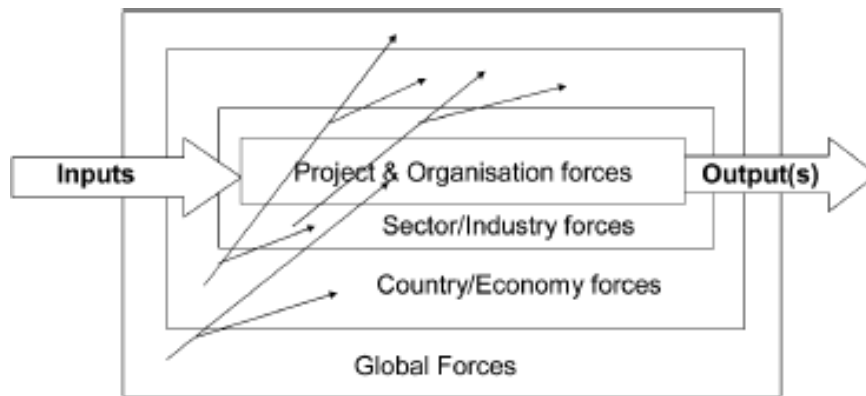


Figure 2.5: Project management in a complex environment

Source: Rwelamila (2007)

Programmes and projects are ascertained as impermanent organizations for enactment of advanced procedures. Additional numerous projects an organization embraces in its project portfolio, the additional distinguished it develops and also the advanced its management density befits. By approach of supporting the effective delivery of separate projects, and to create certain acquiescence of aims of the varied projects with a corporation manoeuvre, Gareis and Huemann (2000:709-721) and Dinsmore (1999) intensely assert that POO should approve detailed incorporate edifices like a strategic centre, consultants pool, a project portfolio commission and a PM centre of capability. A number of these perpetual organizations they propose may well be effective.

Supporting PM smart practices, the POO is classified by presence of a transparent PM philosophy, consisting of a group of PM-related processes, values and norms (Gareis and Huemann, 2000:14-25). In addition, Gareis and Huemann (2000:709-721) contend that so as to manage a POO effectively, solicitation of a replacement model is obligatory—encompassing essential ideas of Total Quality Management (TQM), business procedure re-engineering, lean management, and the learning organization.

By identifying PM as a business and also the procedure of the POO, Dinsmore (1999), Gareis, and Huemann (2000:709-721) sturdily propose that the method of processes management is often practicalized to design the PM method. By outlining the PM procedure, through determining its functions and deliverables, Gareis and Huemann (2000:709-721) dispute

that it's probable to quantify the prevalence of the PM procedure, comprising of the subsequent sub-processes: project start; project coordination; management of project incoherence; project controlling and project closure.

2.4 Strategic emphasis on projects

Graham and Englund (2004: 11) advocate that evolving cooperation obliges higher management to require a systems methodology, that suggests that the corporate ought to interpret projects as a system of interconnected actions that associate to realize a collective objective; this mutual objective is typically the plan of action of corporation. Hence, an organised methodology to project management demonstrates large and vital results of top-management cooperation on project accomplishment.

Eisenhardt and Galunic (2000), attest that elementary determination of instigating a project is to realize vital and precise goals. Consequently, projects that are constant with the tactical aims of the corporate remain doubtless to achieve success. Strategy/tactic concerns two things: determining the corporate vision and reckoning ways in which to accomplish mission.

Rendering to Eisenhardt and Brown (1998), the significance of assigning projects a tactical prominence shouldn't be underrated because it is solitary in every of the most underwriting aspects towards generating a productive atmosphere that encourages and conjures up project accomplishment. Through quintessence, the positive results of a project rely upon actual fact that folks assigned to groups would like direction and this necessitates complete responses to interrogations for instance; what's going to achieve by the project? Therefore, to fully respond, this interrogation will need an in-depth operating data of structure techniques. Why is that this project is being commenced? (To reply to this question can usually require a psychological feature theme). Can there be inter-project teamwork? Response to the current interrogation can integrate a framework of how projects sometimes encompass common resources and an evidence of how assets can syndicate and relate; later, this is often a vital question and can necessitate detailed clarification.

Conferring to Graham and Englund (2004), one among most universal superior management complications expertise in terms of project management is bidding several projects concurrently at the same time. Upper/superior Managers must appreciate particulars of project management practices and facilitate to sustain the project coming up with procedures. This programming methods aids the prioritization of projects and therefore the distribution of resources, that might facilitate with resolution to the issues created by concurrently operational projects. The main benefits with project programming are that it will reduce time spent and costs on executing projects whilst increasing product cost-efficiency and superiority.

It is vital to differentiate amongst a project's accomplishment and project management accomplishment. A project may dissent as of being effective/ ineffective according to how it is observed. Whilst project management success is sometimes determined as conveyancing, on time and at intervals budget that the shopper anticipated in meeting, the standard limits acknowledged for such a project. De Wit (1988:165) assert that a project is contemplated to be effective once the prospects of key shareholders are encountered; nonetheless this gradation of gratification will dissent once measured at dissimilar times of the project period.

The matter of what makes some project managers and a few organizations augmented at what they are doing in conveyancing projects than others has been an issue that has been thought-about for several years. These research focused on vital success elements and main result areas, including distinctive project manager abilities as well as proficiencies, and temperament characteristics. Entire studies have subsidized in their own method (PMI, 2006). Nevertheless, the interrogation of maturity of project management are elevated. Determined principally by the work of the Software Engineering Institute (SEI) and examines through its Capability Maturity Model (CMM), variety of additional normally pertinent models for project management are advanced.

Kwak and Ibbs (2000:32-43) dispute that various organizations are making projects out of their processes and procedures to expedite scheduling, management, and effective achievement of projects. A driving motive for such "projectizing" is the increasing pressure on directors to plan, incorporate, and control schedule-intensives and one-of-a-kind activities in order to advance general organizational enactment.

Nevertheless, it is reasonable to mention that numerous organizations are indefinite, confused, and even misdirected regarding the prestige of existing solicitations of project management. Furthermore, the monetary investment in project management practices, tools and procedures is usually perceived as quite challenging to validate (Kwak & Ibbs, 2000: 32-43).

Cooke-Davies (2004) emphasis that there's associate degree intense attention at intervals organizations to completely perceive the challenge of how best to "measure" project enactment, principally those apprehensive with portfolio management, enterprise-wide project management and governance. There are conversely a rising range of "maturity models" actually created accessible to organizations, either directly or indirectly, to help with the valuation of how "mature" a corporation is (Cooke-Davies, 2004).

2.5 Excellence in project management

According to Kerzner (2003:16), the alteration among an average corporation and the corporation that has attained superiority in project management is the system growth and maturity stages of the project management life cycle are executed. Project maturity is considered as one of the driving forces for project management excellence within the organization. Figure 2. 6 below shows the six key areas in which effective corporations adopt to excel in project management.

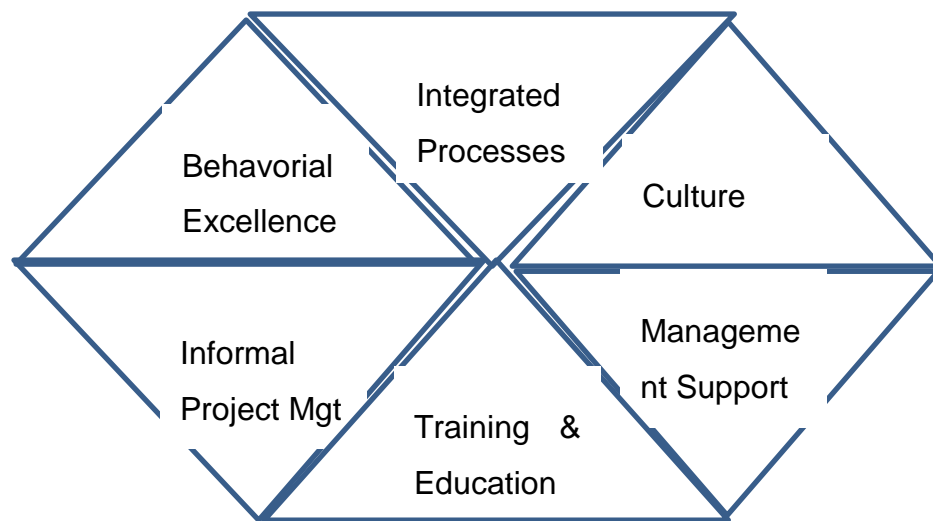


Figure 2.6: The six components of excellence.

Source: Reprinted from Kerzner (1998:14).

2.6 Integrated processes

Organisations which are effective in project management have done so by performing strategic planning. This results in the organizations not matching the competition but surpass the enactment of their rivals. The achievement of this on unceasing basis necessitates standardized methodologies and processes promoting continuous success rather than periodic success (Kerzner, 2003, pg. 17).

Several management processes have been introduced since 1985 have been developed which include Concurrent Engineering, Total Quality Management (TQM), Self-directed teams, Employee empowerment, Reengineering, Life cycle costing, Change management, Project offices, Risk management and centers of excellence, Collocated groups and Multinational teams.

The integration of project management with management procedures is very important in accomplishing excellence. For the quickest are those that identify Project Management that influence maturity and excellence procedures fed on one another. The figure 2.7 below shows an integrated project management maturity – first century;

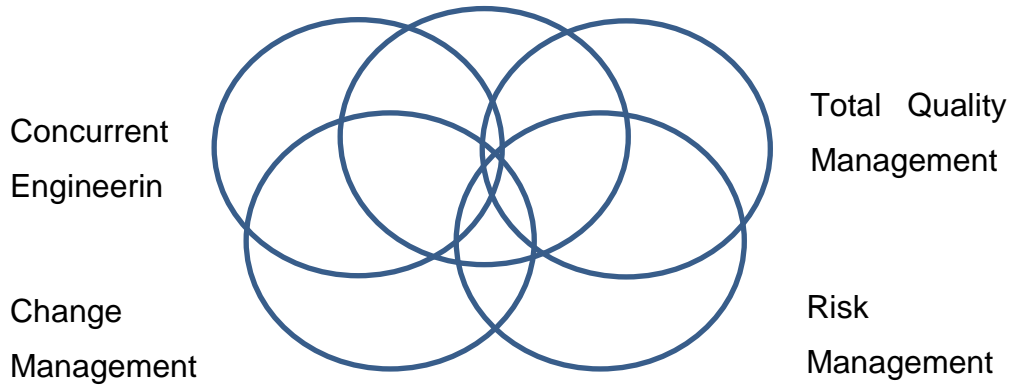


Figure 2.7: Integrated processes for the 20 first century.

Source: from Kerzner (2000:189).

Today, outstanding corporations incorporate five main management processes of risk management, change management, total quality management and concurrent engineering to deliver project management excellence. Total quality management refers to the company objectives to bring market products of better quality on continuous bases.

Concurrent engineering, due the volatile economic conditions companies have invested heavily in addressing the problem of long development times. The companies are not only faced with resources scarcity; time has also become a constraint factor. In the 21st century companies have universally adopted concurrent engineering as the ideal solution to the problem (Kerzner, 2003: 13-25). Risk management is associate systematized way of ascertaining and measuring risk, and developing, selecting, and managing varied choices for handling those risks. It encourages the project manager to aspect the long run and predate what can fail the project, and then advance contingency methods to alleviate these risks. Change management is a critical process in project management, when a consumer initiates a change petition, the project manager should be able to envisage immediately the impact of the change on the program, cost, safety and technical performance.

2.7 Culture

Successful companies which excel in project management incorporate culture as integral embodiment within the organization. The need for responding quickly to demands of the project and yet adapting quickly to a constantly changing dynamic

environment requires an agile organization which is culturally oriented. Excellent companies have realized that to be competitive can be achieved only with the organization culture that promotes necessary behaviour. Corporate cultures for project management are based on organizational behaviour, not processes. It reflects the goals, beliefs, and aspirations of senior management. The speed at which the culture matures, is predicated on the size of the organisation, the scale and nature of projects, and also sort of customers whether internal or external. Successful project management within an organization have a culture which support the four basic values of project management. These basic values are teamwork, trust, effective communication and cooperation.

2.8 Management support

Companies excel because senior managers encourage and offer project managers support and the project team members. It is evident that management support is the critical factor leading to the success of the project (Kerzener, 2005). Senior managers empower its team members through allowing them to make suggestions on alternatives and recommend on ways to solve problems. Successful companies attract project sponsors providing guidance to project team members and managers, so they complete assigned projects within the stipulated time. Management support plays a critical role that drives to the implementation of the project and meeting set goals within the organization. According to Kerzener (2003:13-25), “visible executive support is necessary for successful project management and the stability of a project”.

Support managers are accountable for the coordination of technical and data systems in a company.

2.9 Training and education

Management training helps direct employees and regulates necessary technology, educating employees on the use of software and hardware used in company daily operations. Project management training programmes establishment is revealed to be a challenge faced by training managers since project management entails of various sophisticated and incorporated skills (Kerzener, 2000). However, in effect training supports project management as a profession leading to educated and skilled project

team members, and a successful organization. According to Aguinis and Kraiger (2009), training improves declarative acquaintance within the team, compared to untrained teams, trained teams usually demonstrate better planning and task coordination, collaborative problem solving, and communication in original team and task environments. Training and education helps to improve productivity level and to improve quality of service. Kerzener (2000: 189) clarifies that training build project management knowledge faster in the organization and improves corporate proficiency and effectiveness. Further, training and education result in improved job performance and team well-being (Aguinis & Kraiger, 2009).

2.10 Informal project management

With informal project management tactic, there is no extensive documentation in regard with project plan, roles and responsibilities, scope, and monitoring. Informal project management allows open communication among the team members since it does not involve the use of strict standards and rules for managing the project. Successful companies using informal project management manages the projects based on the necessities of the projects (Wysocki, 2011). Consistent meetings do not take place among the employees which lead to less progress tracking. With informal project management, project manager focuses on coordinating the activities of the team using online team association software. In case of informal project management, the team consents and enables the changes instead of opposing it, (Kerzener, 2003). Moreover, the informal approach flexibility helps in managing complex, vigorous project requirements while rigidity helps in satisfying numerous participants. Informal approach is beneficial to the organization if innovation and risk-taking are more treasured than stability. Project management activities are regularly shared among employees doing the project, and who can make use of online and offline tools they desire to retain track of individual tasks and progress.

2.11 Behavioural excellence

Outstanding companies recognize that project devastations have more to do with interactive inadequacies which are, deprived employee morale, undesirable human relations, low production, and lack of commitment (Kerzener, 2000). Behavioural excellence involves service quality, consumer and staff satisfactions and employee

qualification and their work experience. Successful companies prove enthusiasm and oblige to the assigned projects and project team members. Further, successful manager ensures accountability by allowing project team members to take responsibilities for their assignments. According to Kerzener (2000), “the outstanding project managers organizes and executes the project in a sound and efficient manner”. An excellent manager always involves their team members when making decisions, seeking ideas and resolutions and they also rarely judge the employee’s opinions.

2.12 Summary

This literature review detailed the key components for a successful company to consider having maturity in project management. The literature lacks information on how among the stages of project management maturity, what are the key project capability areas the company must adopt to move to another phase of maturity. The research considered to engage in extensive literature to gain an insight on what is maturity, the stages of maturity and what is necessary the company to adopt to move to another stage of maturity.

2.13 Concept of project maturity

Webster (1988:3, 617) explains “mature” as being able to reach the state of full normal or maximum expansion. Maturity is defined as superiority or state of being mature. If the idea of maturity is applied to an organization, it may denote to a state where the company is in a faultless condition to accomplish its purposes. However, project maturity would then mean that the organization is faultlessly accustomed to deal with its projects.

In reality we will not find the wholly developed organization; no one has achieved the stage of thoroughgoing development and no one will. It makes sense to discuss assured gradation of maturity and make the determination to quantify or illustrate the maturity of the organization.

In numerous fields, such as those determining accomplishments in sports, the arts and performing, industry and trade, assessment of the best enactment is now regularly defined as “world-class” according to Tobin (2004). Maturity is one of the key topics

that measure excellent performance and will lead to either success or failure (Tobin, 2004).

Tobin (2004) proposed an outline for valuation and dimension of excellent enactment. It is proposed that the components encompassed in the structure be utilized separately or in grouping to measure, advance and withstand excellent enactment. Although the framework is specifically with reference to Knowledge Management (KM), it is a useful framework to apply to the business environment and more specifically project management.

Figure 2.8 indicates the several topics of what might possibly be considered as measures of excellent enactment, comprising of Preeminent Practice, Benchmarking, Quality Management, Principles and Proficient Maturity. These individual components have been recognized as perhaps the most important contributors to the ideal that might be used to quantify and manage excellent enactment (Tobin, 2004). The Capability Maturity Model will be used for this research to measure the project management maturity level of BR.

According to Tobin (2004), there is no single measure or ideal, which can be utilized in determining excellent performance, but over time, several components of the planned structure may be implemented both separately and in combination to develop and withstand the organizational enactment.

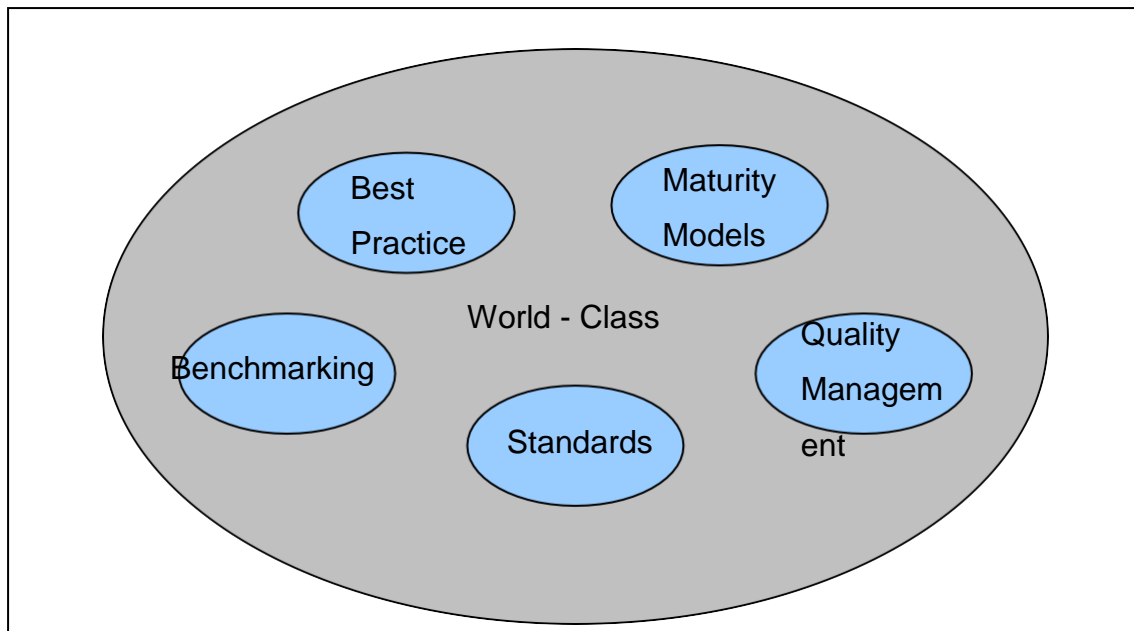


Figure 2.8: Proposed Excellent Performance Framework (Tobin, 2004)

Tobin (2004) also indicates in his World-Class Performance Framework the importance of maturity models. The utmost common methodology to PM benchmarking is through Project Management Maturity Models (PMMM's). Maturity models are outlines for assisting organizations to advance their procedures and systems (Sonnekus and Labuschagne, 2004). This illustrates that for the organisations to reach project success benchmarking against the maturity model is paramount.

Numerous diverse maturity models have been presented to the PM public (Pennypacker & Grant, 2003). These replicas/models try to quantify the company's level of PM Maturity by a ranking system grounded on the degree that diverse practices, procedures, and expertise are in place (Griffith, 2006).

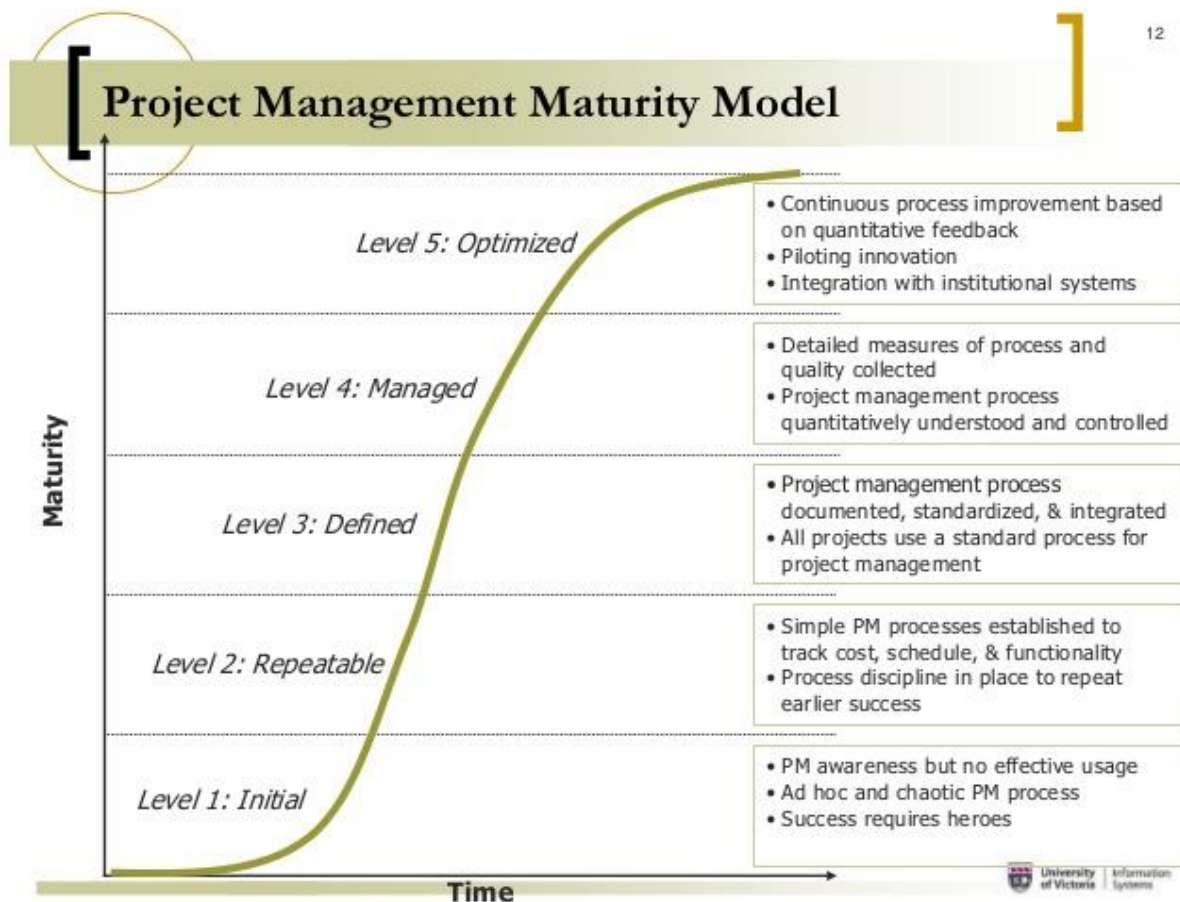
The well-known thinker and advisor in the field of project management (Kerzner, 2011) highlights that "all organizations bear a maturity process" and to the investigator's opinion Botswana Railways is no immunity to this. "Maturity in project management is the improvement of schemes and procedures that contribute to success" (Kerzner, 2011:778). On the other hand, embraces the opinion that these schemes and procedures do not actually assure accomplishment, they simply upsurge the likelihood of accomplishment.

(Dinsmore, 1999) describes organisational project management maturity level as:

“... a measure of an organization’s effectiveness in the behaviours involved in delivering projects.”

Further Dinsmore (1999) disputes that a maturity valuation is a way of defining the degree to which the organization has integrated project management into its method of operating. The better the organization or subdivision is at conveying projects; the complex its maturity will nurture. According to Crawford (2006), a virtuous ideal for the dimension of PM Maturity generate the tactical plan for moving PM forward in a business. Most maturity models refer to five levels, and are all quite similar in nature, ranging from one (ad hoc stage) to five (Sustained stage) as illustrated in Table 2.1.

Table 2.1: Key project management Processes (Kwak & Ibbs, 2000)



2.14 History of project management maturity models

Project management maturity models (PM³s) originated in the late eighties when various projects appeared not to achieve aims established for the projects. The first institution to advance a maturity model in the project management auditorium was the Software Engineering Institute that advanced the Capability Maturity Model (SEI-CMM) (Crawford, 2002). The Software Engineering Institute (SEI) of Carnegie Mellon University has done much exertion over past decade in understanding the areas of organizational expertise necessary to help organizations to consistently produce quality software products (Crawford, 2007).

This expansion was responding to the prerequisite from the USA Department of Defence to classify proficient software contractors (Humphrey, 1999). The ideal outlines what requires to be implemented to advance the capacity to convey what the

customer wants within the constraints of time, quality and financial plan. The development of the Capability Maturity Model has resulted in evolution of diverse kinds of project management maturity models. The (PMI, 2008: 171) emphasizes that nowadays there are many maturity models utilized.

Numerous diverse maturity models are familiarized to the PM public (Pennypacker & Grant, 2003). The models attempt to evaluate an organization's PM Maturity level through a ranking system based on the degree differentiating practices, procedures, and abilities are in place (Griffith, 2006). In addition, Cooke-Davies (2004), highlights that there are more than 30 models. These maturity models vary in terms of their features, aspects and ways that affect maturity level. There are seven (7) common project management maturity model, which are Kerzner Project Management Maturity Model, PMI – Project Management Maturity Model (PMMM), Software Capability Maturity Model (SW-CMM), Organizational Project Management Maturity Model (OPM3), PRINCE2 Maturity Model (P2MM), Portfolio, Programme and Project Management Maturity Model (P3M3).and Berkeley project management Process Maturity Model.

This investigation statement covers seven maturity models which the investigator view as being extensively utilized in contemporary project management literature. The dualistic models are organizationally attentive to Maturity Models (for example, OPM3, and PM3M3) and the other five models are project attentive (Cooke–Davies, 2004). The research will focus on this organizationally focused maturity since the research aims to assess the maturity level of BR as whole organization. An in-depth overview of literature of this two (2) maturity models will be deliberated in the following sections.

2.14.1 Organizational project management maturity model (OPM3)

The Institute of Project Management pioneered the platform to advance a transnational standard for business and government in the United States of America. “The Organizational Project Management Maturity Model, or OPM3, was considered as a project management effect to the diversity of maturity prototypes in the market environment. Most of these maturity prototypes are used to advance an institution's quality, substructure or procedures” (PMI, 2008: 8). OPM3 is an abbreviation for “Organizational Portfolio, Programme, and Project Management Maturity Model”.

OPM3 was envisioned to guide the development of competences needed to implement organizational tactic through effective projects – as differentiated from abilities connected merely with management of separate projects (PMI, 2008: 171).

According to Kerzner (2004), the model offers categorized structure with a number of preeminent practices, respectively encompassing numerous proficiencies, with each ability leading to results which can be measured by Key Performance Indicators (KPI's) and metrics. The OPM3 model has elementary components as follows:

- Standard Practices in Organizational Project Management;
- Identifies connection among tactical scheduling and implementation, so project results are foreseeable, dependable, constant, and associate with company success;
- Classifies the Preeminent Practices which sustain the execution of organizational tactic through effective projects;
- Project management Competencies leading to advanced maturity and designate reality or achievement of unsurpassed practices in the organization;
- “Navigation paths” ought to navigate Competences on the way to amplified maturity in besieged unsurpassed practices;
- One or extra noticeable Results indicating the existence or accomplishment of each Competence;
- One or additional Key Performance Indicators, which are the resources of assessing each Result; and
- Ideal setting, comprising of the Organizational Project Management Process and the phases of process development.

These Preeminent Practices, Competences, Results, and Key Performance Indicators laterally through essential narrative descriptions, directional rules, and explanation of Organizational Project Management process—constitute OPM3.

The PMI model is aimed to assist companies evaluate the state of their organizational project management maturity as well as assist them in planning pathways to initiate developments. Supposing the company desires to initiate developments, OPM3 is envisioned to assist them to decide on the specific competencies they ought to obtain to accomplish the desired Best Practices, hence they can develop their programme

while preserving inadequate organizational resources (Fahrenkrog *et al.*, 2003). Nevertheless, affiliates of the team warn, while it [OPM3] can be a powerful reference and development tool, its effective use will require significant thought, digestion, application, analysis, and evaluation—not possible through just reading the standard, (Fahrenkrog *et.al*, 2003).

Cooke-Davies (2004) feels that without mentioning OPM3, there is no conversation among organizational project management maturity that would be completed, Project Management Institute's organizational project management maturity model explains organizational project management maturity as:

“The extent to which an organization practices organizational project management”. (PMI, 2008: 8)

This model was designed to achieve the following area of focus of the enterprise (PMI, 2008: 8):

- to assist organizations, measure and advance their project management abilities including competences essential to accomplish company tactics through projects; to establish the standard for superiority in project, portfolio management and platform unsurpassed practices; and
- clarification of competencies essential to attain those unsurpassed practices

Evolution of cumulative maturity premeditated into OPM3 entails of numerous proportions, or diverse means of considering organization's maturity. One element comprises of inspecting preeminent practices in relations to their connotation with advanced phases of process development--from **Standardized** to **Measure** to **Control** and to **Unceasingly/Continuously Develop**. An extra component implicates the advancement of Preeminent Practices related with each of the dominions, primarily addressing Project Management, followed by Program Management and at last, Portfolio Management. Severally evolutions are a continuum laterally along which most businesses obtain to develop. Conjointly among these two (2) measurements is the evolution of progressive Abilities prominent to each Preeminent Practice. This is often diagrammatically outlined as presented in Figure 2. 9? below:

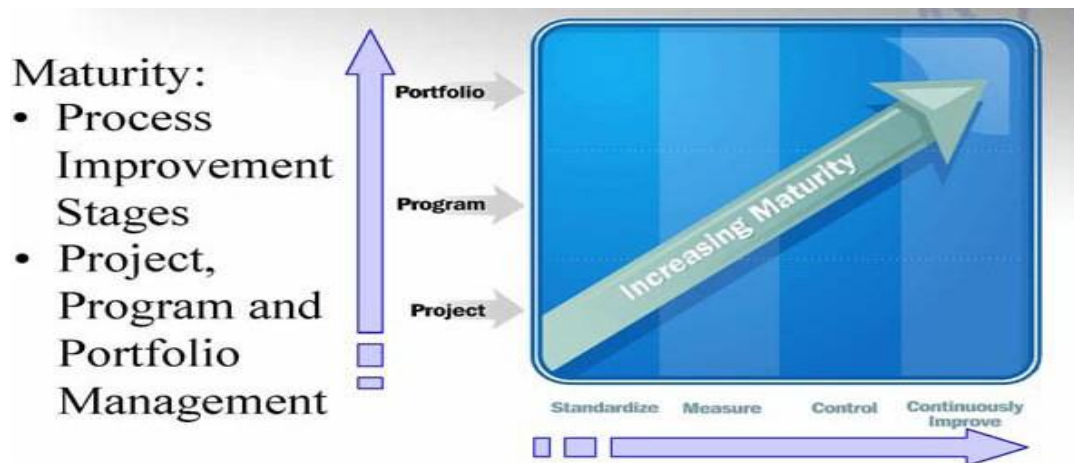


Figure 2.9: The organizational project management maturity model (OPM3)

Source: PMI (2008).

OPM3 pursues to generate structure within which companies can reconsider their search of tactical aims through Unsurpassed Practices in organisational project management. This Standard is a preliminary declaration on this Model, classifying and establishing considerable number of mostly acknowledged and verified project management practices, and offering resources to measure an organisation's maturity contrary to the Preeminent Practices recognized in this standard (PMI, 2008:171).

To end with the outcome of such assessment, an organization can choose whether to plan for developments – and how to approach developments – to upsurge its maturity by evolving more of the abilities identified by the standard. According to PMI (2008:171), the OPM3 is encompassed with three overall components as presented in Figure 2.10 and these include:

Knowledge, bestowing the components of the Standard;

Assessment, providing a technique for distinction with the Standard; and

Improvement, establishing the phase for credible organizational variations.



Figure 2.10: Three General Elements of the OPM3 Standard

Source: PMI (2003).

The OPM3 Knowledge Foundation/basis is the initial phase and is a privilege for extra two components. Valuation requires to be completed with the assistance of the tool and techniques that complements the Knowledge Foundation. The Knowledge Foundation comprises of comprehensive list of Preeminent Practices. Additionally, it contains a list of interrogations for self-valuation.

Ability Directory and the Development Directory are contemporary in techniques that aids to traverse through the model (PMI, 2008:171). OPM3 was purposely planned to exclude an overall scheme of “Levels” of maturity. Creating precise maturity stages may be comparatively forthright if the evolution of maturity is one element. For instance, as deliberated above, there is an evolution of four (4) phases of process maturity as of course calibration through to endless procedure development. OPM3 on the other hand, is multi-dimensional. Adding to the three (3) proportions discussed above, “OPM3 similarly classifies Competencies in expressing connotation with the five (5) project management Process Groups [Initiating, Planning, Executing, Controlling, and Closure (IPECC)], allowing appraisal of a fourth part measurement of maturity. Figure 2.11 is the delineation of IPECC element – five Process Groups from PMBOK utilized for project, Programme and Portfolio Management” (Kerzner,2011), Figure 2.12 below illustrates OPM3’s multi-dimension level of maturity.

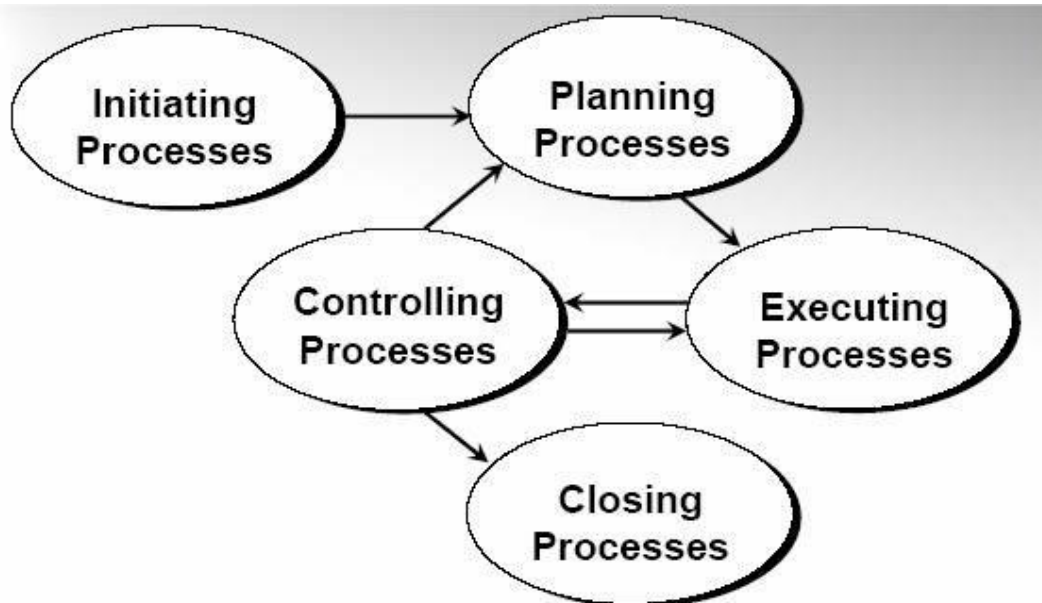


Figure 2.11: IPECC dimension – 5 Process Groups

Source: PMI (2003).

Various perceptions for evaluating maturity enable suppleness in relating OPM3 to distinctive necessities the company. This method produces a more vigorous body of data than is probable with modest, linear system of levels, providing organization with details in sustenance of verdicts as well as tactics for development.

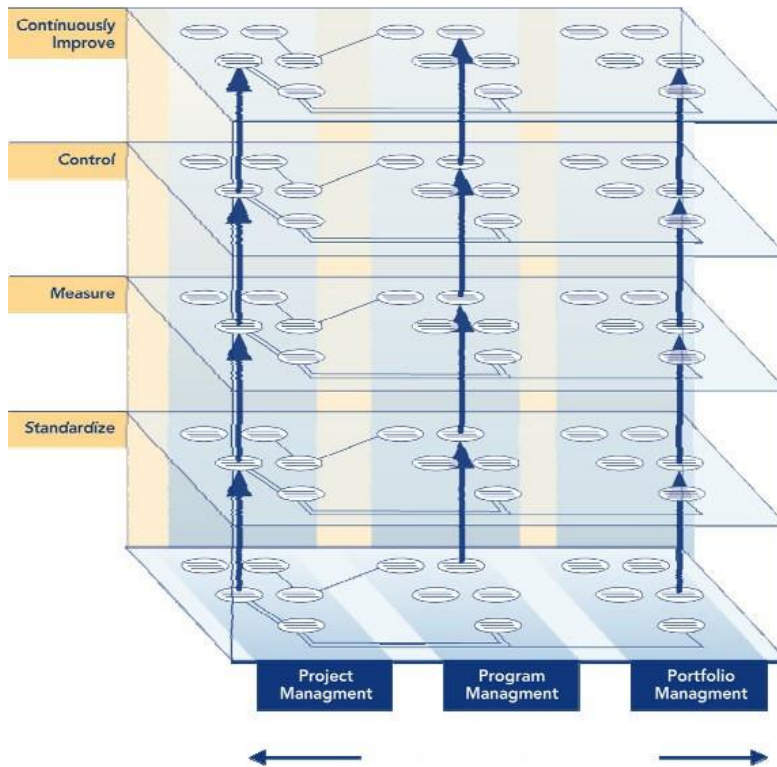


Figure 2.12: OPM3's Multi-Dimension Level of Maturity

Source: PMI (2003).

2.14.2 Portfolio, programme and project management maturity model (P3M3).

A five-level maturity structure describes the Portfolio, Programme and Project Management Maturity Model (P3M3). The model is retained by Axelos, joint venture among the UK Government and Capita which took possession of the resources in Jan 2014. Prior to this, P3M3 was retained by the Office of Government Commerce (OGC), a department within UK Government which its obligation is to assist public sector organizations to increase their proficiency, advance improved value for coinage from procurements and convey enhanced achievement from programmes and projects. These levels constitute the fundamental mechanisms containing the P3M3 (OGC, 2006). "The Portfolio, Programme and Project Management Maturity Model (P3M3), designated in this manuscript, is an improved type of the Project Management Maturity Model advanced by Office of Government Commerce", (Kerzner, 2005).

In various segments, administration models developed in significance to turn into the basis for measuring organizational competence and recognizing prospects for enhancement. P3M3® was among the preliminary maturity models in the portfolio,

programme and project management (P3M) subdivision. It was foremost unconfined in 2005 and is now in its third iteration (AXELOS, 2015).

The P3M3 designates the portfolio, programme and project associated undertakings within key development areas that subsidize to attaining an effective project result. According to (Gareis & Huemann, 2000) “the P3M3 identifies not only the programme and project management undertakings being conceded at the distinct programme and project level, but similarly those actions contained by an organization that offer emphasis and help withstand determinations to figure a programme and project substructure of efficient programme and project methods and organizational practices”. In the absenteeism of an organization extensive programme and project substructure, reiterated outcomes be contingent completely on the accessibility of precise individuals with a verified record of accomplishment; this does not essentially offer the foundation for long-term achievement and constant development all over the organization (OGC, 2006).

“The Portfolio, Programme and Project Management Maturity Model (P3M3) could also be utilized as the source for refining portfolio, programme and project management procedures”, (Graham & Englund, 2004). It is regulated by five maturity levels.

The five (5) levels establish the fundamental mechanisms encompassing the P3M3 and may be characterized as delineated in Table 2.2 below.

Table 2.2: The Structural Components that Comprise the P3M3 Model

| Maturity: | Project | Programme | Portfolio |
|-------------------------------------|---|---|---|
| Level 1 - initial process | Does the organisation recognise projects and run them differently from its ongoing business? (Projects may be run informally with no standard process or tracking system.) | Does the organisation recognise programmes and run them differently to projects? (Programmes may be run informally with no standard process or tracking system.) | Does the organisation's Board recognise programmes and projects and run an informal list of its investments in programmes and projects? (There may be no formal tracking and reporting process.) |
| Level 2 - repeatable process | Does the organisation ensure that each project is run with its own processes and procedures to a minimum specified standard? (There may be limited consistency or co-ordination between projects) | Does the organisation ensure that each programme is run with its own processes and procedures to a minimum specified standard? (There may be limited consistency or co-ordination between programmes) | Does the organisation ensure that each programme and/or project in its portfolio is run with its own processes and procedures to a minimum specified standard? (There may be limited consistency or co-ordination) |
| Level 3 - defined process | Does the organisation have its own centrally controlled project processes, and can individual projects flex within these processes to suit the particular project? | Does the organisation have its own centrally controlled programme processes and can individual programmes flex within these processes to suit the particular programme? | Does the organisation have its own centrally controlled programme and project processes and can individual programmes and projects flex within these processes to suit particular programmes and/or projects. And does the organisation have its own portfolio management process? |
| Level 4 - managed process | Does the organisation obtain and retain specific measurements on its project management performance and run a quality management organisation to better predict future performance? | Does the organisation obtain and retain specific measurements on its programme management performance and run a quality management organisation to better predict future programme outcomes? | Does the organisation obtain and retain specific management metrics on its whole portfolio of programmes and projects as a means of predicting future performance? Does the organisation assess its capacity to manage programmes and projects and prioritise them accordingly? |
| Level 5 - optimised process | Does the organisation run continuous process improvement with proactive problem and technology management for projects in order to improve its ability to depict performance over time and optimise processes? | Does the organisation run continuous process improvement with proactive problem and technology management for programmes in order to improve its ability to depict performance over time and optimise processes? | Does the organisation run continuous process improvement with proactive problem and technology management for the portfolio in order to improve its ability to depict performance over time and optimise processes? |

Source: OGC (2006).

Just like OPM3, main advantage of using P3M3 is that it offers a widely existing set of sovereign standards. These are not patented/limited and can be used by all organizations regardless of their approaches. The overall benefits that may be recognized after using P3M3 comprise:

- Assisting organizations to choose which maturity level they require to accomplish their commercial needs.
- Generating a consistent P3M (portfolio, programme and project management) competency model in contradiction of which developments in P3M competence enactment may be accurately measured.
- Directing investment on those features of P3M that will lead to the best developments intended for the particular organizational framework.
- Identifying accomplishments from preceding investment in competence enhancement.

2.15 Research Variables

The research aims to measure the level of organizational project maturity level in the next variables. A diminutive synopsis of the research variables in terms of the best practices will be discussed in this section. This seven (7) variables has been identified to be the cornerstone to measure the organization capability according to the in-depth literature conducted above. “The capability is a specific proficiency that must be in existent in an organization for it to implement project management procedures then convey project management services and products”, (Kwak & Ibbs, 2000). Competences are augmentation steps prominent to one or more Preeminent Practices.

2.15.1 Process, Standards, Methods & Procedures (according to 10 PMI knowledge areas)

The PMBOK developed by Project Management Institute describes ten (10) knowledge areas/ classifications of the project management chastisement, which sets as a standard of project management. These knowledge areas include:

- Integration Management - project assortment approaches and methods, shareholder analyses, project management tactics, project management

software, charters, lessons-learned reports, review meetings, change control boards and change requests

- Scope Management - declarations of work, scope statements, requests analyses, work breakdown structures, mind maps, scope modification controls, scope management plans, and scope confirmation techniques.
- Time Management - critical-path analyses, fast tracking, Gantt charts, schedule performance dimensions, crashing, project network illustrations.
- Cost Management - Earned value management, net present value, payback analyses, return on investment, cost standards, cost estimations, managing cost tactics, and project portfolio management.
- Quality Management - Quality control charts, fishbone illustrations, statistical models, quality metrics, maturity models, Pareto graphs, and checklists.
- Human Resource Management - Project organizational diagrams, resource histograms, team building workouts, empathic listening, responsibility task matrices, and motivation systems.
- Communications Management - Virtual communications, outlines, Communications plans, kick-off meetings, status and growth reports, project web sites, conflict resolution and communications media assortment.
- Risk Management - risk records, risk statuses, prospect/impact matrices, and Risk management plans
- Procurement Management - Source assortments, make-or-buy analyses, application for proposals or quotes, contracts, supplier assessment matrices.
- Project Stakeholder Management - plan stakeholder management, Identify Shareholders, Manage Shareholder Engagement & Control Investor's Engagement.

The purpose of the research is to get an understanding of the level of application of these knowledge areas in BR and their maturity level.

Project Management Maturity Model

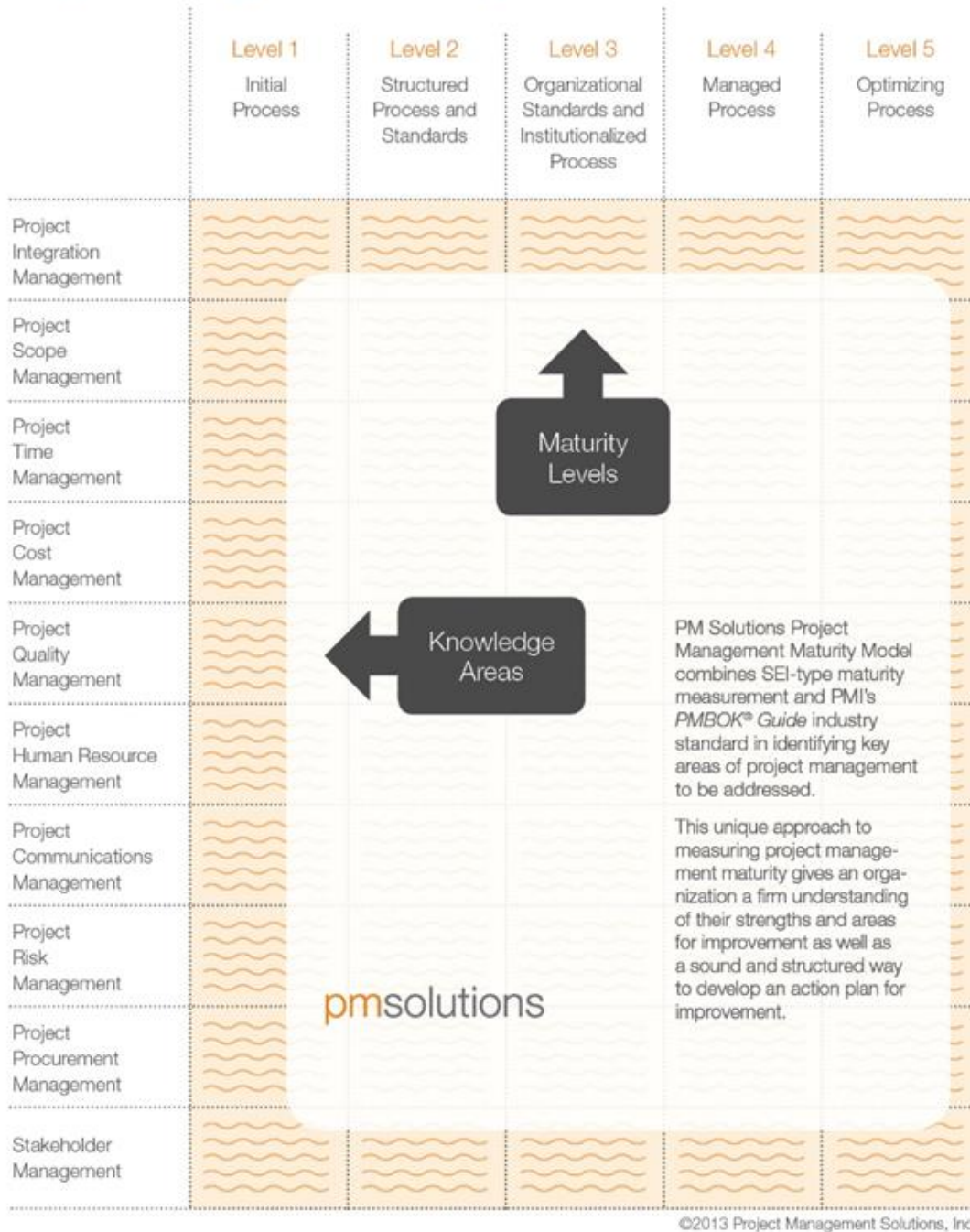


Figure 2.13: PMI project maturity model (Green, 2006)

2.15.2 Knowledge Management

The research variables aim to measure the maturity level how project management is adopted within the organization. It looks at the organizational governance and the applied management controls. These perception aspects at how the conveyance of creativities is associated with the planned course of the organization. It reflects how the start-up and conclusion controls are pragmatic towards creativities and in what way arrangement is upheld throughout the initiative's lifespan. The variable also looks on the benefits management perception, which focuses on guaranteeing that the company outlines and manages the value that it forestalls achievement from the investment.

2.15.3 Technology management

This variable seeks to measure the level of update of technology in the project management within the organization. The research aims to analyse the maturity level in the use of technology in project management. Companies capitalize in PM tools and systems, such as computer software for refined program and financial plan pursuing complex organizational process designs like simultaneous engineering (Thamhain, 1999). Various companies capitalize in expertise to advance organizational enactment and to increase competitive benefit. In this technology compelled business atmosphere, projects, due to project intricacy and scope, are bound to make use of technology and tools expansively. Moreover, benefits of information technology (IT) and knowledge management (KM) are inspirational even co-located project teams to utilize technology for association and communiqué. According to (Anantatmula, 2008) technology is utilized to signify both the IT and KM for two motives: (1) KM is reflected as a connection amongst IT and commercial and (2) merging reciprocally both KM and IT will offer prospects to improve performance in a project environment.

2.15.4 Decision support management

Decision support is important through-out the course of the project life cycle. Project Board including Executives are essential to provide governance to the project. There are responsible to corporate management for accomplishment of project and devours the ability to direct the project within the responsibility set by communal or programme

management as acknowledged in the project directive. Executive is eventually accountable for the project to guarantee that it provides value for money and cost cognizant approach to the project. The function is act as gate reviews which gives the project signals of “go – on” or “not – go” during the critical project lifespan. This is critical variable within the project management ambient hence; it needs to be measured to determine its level of maturity within the organization.

2.15.5 Continuous process development

‘Virtuous/good practice’ means there is overall contract that the accurate solicitation of these abilities, tools, and techniques can improve probabilities of accomplishment over a comprehensive variety of diverse projects, in other words, something that works well on a monotonous foundation or something that principals to an economical advantage (PMI, 2006). Preeminent practices can be in the form of prototypes, rules, strategies, or processes which everyone has agreed to follow. Lessons learned acknowledged by the project team during the lifecycle may be the foundation of best practice for an organization. Preeminent practices are very dynamic; they are revised, rationalized or removed over time.

The utilisation of preeminent practices guarantees capability to convey projects probably, continuously, and successfully. Hence, classifying preeminent practices and refining them constantly in a significant exercise for any organization that seeks to accomplish excellence in PM. This is identified as continuous improvement. For instance, directing constant project management training in the organization, or creating a formal change control system with definite change control process can be best practices of an organization.

The best practices are made up of competences. Capability is a specific competency that can be used to device projects. Each best practice should have its related competences that help to accomplish the best practice (PMI, 2003). The best practices can be at different maturity levels therefore; it is paramount to measure the organization level in the continuous process improvement capability.

2.15.6 Portfolio resource management

Portfolio resource management consist of the processes that consent an organization to effectually allocate the suitable resources (number and skills) to productively execute the projects in the portfolio. It helps to make sure that the company's resources are apportioned appropriately to meet the business needs. It also offers management with data for forecasting forthcoming resource necessities (Pennypacker, 2005).

2.15.7 Professional development management

Project Superiors are required to go further than managing projects. It is just as significant for project superiors to manage their profession and capitalize time and determination towards improving their professionalism. In background of project management, professional improvement involves obtaining understanding and abilities, which are consistent and up to date with the regularly developing practice of project management. Apart from verifying credential progressions in project management, project superiors can pay attention to podcasts, recite books, attend conferences or webinars by way of creating interrelated content and broadcasting it. Being dynamically involved by such means not only contributes to the project management public but also preserves managers posted on all matters of significance and recent improvement. It similarly enables managers to stay associated, share and acquire from each other's capabilities, work together and often reach out and simply tap into the enormous source of knowledge and resources. This variable looks into the obligation by the organization and Project Managers in the areas of professional development in project management.

2.16 Summary of maturity models (OPM3 & P3M3)

The OPM3 and P3M3 are the well-known industry maturity models, which can be utilized to measure the organizational project maturity. Assessing the organizational capability against recognized maturity model can provide a considerable return on investment (ROI), a known and independent verifiable maturity, a prioritized road map to the next maturity level and contrast with other organizations. The Project Management Institute, USA developed P3M3 maturity model while UK Government's

Office of Government Commence (OGC) developed OPM3 maturity model. The table below analyses the attributes of this maturity. An evaluation was conducted to check if they could be used to assess the research variables.

Table 2.3: Comparison of OPM3 & P3M3

| Organisation Maturity Model | OPM3 | P3M3 |
|---|-------------|-------------|
| Stages of Improvement | One to Four | One to Five |
| Variables | | |
| Process Standards, Methods and Procedures | Yes | Yes |
| Knowledge Management | Yes | Yes |
| Technologies | Yes | Yes |
| Decision Support | No | Yes |
| Portfolio and Resource Management | No | Yes |
| Professional Development | No | Yes |
| Continuous Process Improvement | Yes | Yes |

Based on the comparison, the researcher concluded that the P3M3 is viable for the research as it measures all the variables required. A questionnaire will be developed as guided by the P3M3 project maturity model.

2.17 Capability areas to improve project maturity

In the previous sections, a literature review was conducted on the importance of measuring success on project management and how project management maturity model can be used is directly related to project success. The primary factors of measuring success are to evaluate of the project has been accomplished on time, within cost and at the desired quality. However, secondary factor of measuring success is the project accepted by the customer and has met the expectations of the customer.

All companies should go through a maturity procedure and this maturity procedure must supersede the superiority or success. Committed companies attain maturity in two years, while the average firm may take up to five years. It is fundamental to measure the gradation of project management maturity and what are the capability areas to move to the next maturity level. The following Table 2.4 below shows the phases the organization to consider in improving the project management maturity level.

Table 2.4: Capability areas improving project management maturity level (Kerzner, 2000:33)

| Level 1: "Ad Hoc" | Level 2: "Planned" | Level 3: "Managed" | Level 4: "Integrated" | Level 5: "Sustained" |
|-----------------------------|---|---|--|---|
| Recognize need | Get Visible executive support | Get line management support | Recognize use of life cycle phases | Develop a management cost/schedule control system |
| Recognize benefits | Achieve executive understanding of project management | Achieve line management commitment | Develop project management methodology | Integrate cost and schedule control |
| Recognize applications | Establish project sponsorship at executive levels | Provide line management education | Make commitment to planning | Develop an educational program to enhance project management skills |
| Recognize what must be done | Become willin to change way of doing business | Become willing to release employees for project management training | Minimize creeping scope | |
| | | | Select a project tracking system | |

Level 1 Ad hoc or Embryonic Phase

Both the intermediate and senior management must recognize the necessity for, benefits, and applications of project management. They must know excellence in project management will affect the corporate bottom line.

Level 2 Planned or Executive Management Phase

For the organization to move to phase 2, it is important that executives clearly ascertain their support if the company is to become advanced in project management. Lack of perceptible executive support is the biggest impairment to attaining maturity and superiority in project management.

Level 3 Managed or Line Management Support Phase

Line management would eagerly accept and support project management while realizing that his or her superiors would support the process. The line managers do not need to understand the project management tools, but the philosophies of project management. They are responsible for the staffing of the projects. Therefore, to move

into this phase is necessary for line managers to offer perceptible support and obligation for the process.

Level 4 Integrated or Growth Phase

The fourth level is the growth phase. This stage can essentially begin as early as the ad hoc and run in equivalent with the first three stages. These three phases needs to be accomplished before this stage can be completed. The knowledge of project management by senior management quicken the growth stage. Project management methods are advanced and refined for control and calibration. This ensures the company to retain obligation to quality and scheduling, and minimizing scope creep. Another final element in the growth phase is selection of a software package for project planning and control.

Level 5 Sustained or Maturity Phase

Most firms get into four phases soon and it takes 12 to 24 months for aggressive companies to get into the growth phase. The maturity phase request and mandates the organization to understand the importance of integrating time and cost. The cost control and schedule departments should sit in one office; this will promote integration between these departments. The integration of time and cost requires revamping of the cost accounting system to include earn value management. The improvement of a long-term educational platform is a solution for the organization to maintain its maturity position. The project team is required to document “lessons learned” to integrate on the educational programmes.

2.18 Summary

This section enclosed and assessed basic philosophies of project management, its importance in project leaning organizations and factors to consider for project management excellence. The chapter further examined an in-depth project management literature review with specific emphasis on the conception of project management maturity and project maturity valuation models.

The research examined in-depth literature review how it discourse the empirical questions and the aims of the study. This section covered an integer of regularly

utilized contemporary maturity models, this are set up to be established on the Capability Maturity Model. The section looked on the assessment of the available maturity model and selection of the relevant model for the research. The chapter concluded by identifying the project management capability areas to move from one stage of maturity to another level.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The current section discusses the study methodology in detail. The chapter presents the research technique, design and methods used to examine the research problem identified in Chapter 1. The research focus is on the subsequent main study question: What is the gradation of the organizational project management maturity level of BR?

The primary aim of the research is to measure and estimate the overall project management maturity level of BR using P3M3 assessment model owned by Axelos. Thereafter, strategic objectives and capability areas are identified and considered to improve its project management maturity to the next maturity level.

The tool used to accumulate data includes approaches used to retain validity and dependability will be designated in the chapter.

3.2 Research Approach and Design

The researcher used quantitative research methodology. The quantitative data includes closed-end information that undergoes statistical analysis and results in a numerical representation. There are numerous definitions of quantitative research, Bryman and Bell (2014:31) define it as:

“...as a distinctive research approach that entails the collection of numerical data, regards the relationship between theory and research as deductive, prefers a natural science approach in general (and positivism in particular), and adopts an objectivist conception of social reality”

Quantitative research includes methodologies such as closed surveys, structured interviews, observation, questionnaire, statistical analysis and sociograms, which facilitate data to be gathered, measured and compared with a regular consulted from the literature review.

However, Kumar (2005) defines qualitative research as:

“...a phenomenological perspective whereby researchers aim to understand, report and evaluate the meaning of events for people in particular situations, that is, how their social world is structured by the participants in it.”

The research method involved how the participants responded and interpreted their experience and construct reality. Qualitative research involves methodologies such as unstructured interviews, open-ended questionnaires, focus group and participant observation.

The qualitative method analysed the general effectiveness level of project management in BR. A survey questionnaire guided by the adopted best practice P3M3 maturity assessment model to determine current organizational project management maturity processes. A project survey was conducted by the research questions and objectives of the research as guided by the theoretical framework represented in Chapter 2. All interrogations or declarations should carry the same weight. A 5-point Likert scale extending from ad hoc (1) to sustained (5) was used as a research methodology. When answering, the participants deliberated on all the projects that they were involved with and responded to the questionnaire in accordance. The questionnaire was aimed at measuring project management variables identified in Chapter 1 relative to their project management maturity level. The results gathered from the quantitative research produced tangible measurable statistics which can be used for future benchmarking and continuous improvements.

3.3 Study Context

The context of research was piloted in BR at a state enterprise owned by the Republic of Botswana and the participants were identified within the organization. The study consists of participants from all departments within the organizations who have direct or indirect responsibility of project management. The study was done in Mahalapye Headquarters, satellite stations, organization stakeholders and subsidiaries such as Sea Rail, BR Properties, JTTM and GABCON.

3.4 Population and Sample Study

Before an actual assessment begins, it is beneficial to design how the research would be conducted to achieve maximum result. Therefore, the investigator has to choose

the samples, outline the target inhabitants, and first-rate a sample frame and data collection methods considerately. According to Burns and Grove (1993:779), “a population comprised of all elements (individuals, objects and events) that meet the sample criteria for insertion in a study”.

The possible target populace pertinent to the qualitative research population included approximately 50 respondents. The respondents were from diverse areas of the organization to keep the study outcomes as objective as possible. These participants fall into the following classifications:

- Project owners/holders from diverse business units/departments – these are fundamentally the consumers of the BR project management office. They understand organization needs and the organization’s insight of the description of project success.
- BR programme and project managers – these contestants have hands-on involvement with BR project management methodology and ensures adherence to the methodology. They have overall responsibility for the delivery of capital projects in the effective and efficient manner.
- Other team members who are involved in and exaggerated during project management – these are shareholders, such as business analysts/forecasters, contract managers, product/service users, cost accountants etc.
- Stakeholders and subsidiary team members – these participants are indirectly affected during project management. The stakeholders may include the government authorities, legal entities and local authorities. The subsidiaries are sister companies of BR, of which the organization is the shareholder.

3.4.1 Sampling Criteria

Participants involved in the sample were nominated to meet precise criteria. Participants had to meet all the following conditions:

- had to be presently working in BR and subsidiaries;
- had to be directly and indirectly responsible for the delivery of projects within BR and its subsidiaries;

- had to acquire project management understanding and/or must be project shareholders with resilient interests in or are unswervingly affected by the project;
- had to be in Botswana during the time of assessment;
- had to be mentally sound;
- had to be eager to partake; and
- of either gender or any race.

The investigator adopted the stratified random sampling strategy. The sample contained a proportional representation of different departments of the company (Bryman & Bell, 2014:173). Once the sample had been selected, the investigator designed a research-based questionnaire, based on the designed organizational project measurement maturity model. The investigator started with the quantifiable investigation by leading a pilot study on a few participants to make sure the surveys are participant-friendly to make sure the information met is dependable. As soon as the pilot had been completed, the surveys were rationalized and referred to the extensive spectators. According to Bryman and Bell (2014:209), it is constantly required, if probable, to carry out a pilot study before administering a self-completion survey or structure interview to your trial piloting has a role in confirming that the research instrument functions well.

Table 2.5: Sample elements distribution

| CATEGORY | SAMPLE SIZE | PERCENTAGE OF THE ENTIRE SAMPLE |
|--------------------------------------|--------------------|--|
| Project owners | 10 | 20% |
| Project managers | 5 | 10% |
| Other project management team | 15 | 30% |

| | | |
|------------------------|----|------|
| Subsidiary team | 10 | 20% |
| Stakeholders | 10 | 20% |
| Total | 50 | 100% |

3.4.1 Inclusion Criteria

Enclosure criteria are a set of pre-defined features used to detect subjects who will be involved in a research study. Enclosure criteria, along with elimination criteria, make up the selection or suitability principles used to rule in or out of the target population for a research study (Cooper & Schindler, 2006).

The research used a version of judgemental sampling i.e. the determined variation/heterogeneous purposive sample to offer various range of circumstances pertinent to the phenomenon under study. The sample was taken from population of people with relevant project management experience who had direct or indirect relationship to the organization project management. Any member of the population who fit into these classes was considered for selection into the sample.

3.4.2 Exclusion Criteria

Exclusion/elimination criteria are those features that eliminate potential subjects from inclusion in the study (Cooper & Schindler, 2006). The target sample was selected from only the participants with relevant experience in handling projects in BR and are the end users of the delivered products/services. The participants were first interviewed before handing the questionnaire to check their relevance to the study. The participants were identified from the organization, an organizational structure and job profiles is used to identify the relevant participants for this study.

3.5 Data collection strategies

a) Quantitative

A close ended questionnaire was selected as a data collection tool. Self-completion or administered questionnaire means that respondents answer questions by completing the questionnaire themselves. The questionnaire was hand-delivered as the respondents are all found in close proximity and to encourage a high response rate. This method is cheap and quick to administer. A template of the questionnaire is recorded under **Annexure A** of this dissertation.

The researcher conducted an extensive literature reviews on philosophies of project management and its importance in project-oriented organizations. The researcher also analysed the literature in relation to the primary research interrogations understood the idea of project management maturity and various based practice organizational project maturity assessment models.

The qualitative research instrument was guided by the project management maturity matrix model advanced by the Office of Government Commerce, UK. A detailed model description is in **Annexure B** of this dissertation. The model allows the researcher to assess and evaluate the current maturity level of BR. This identifies phases of the organization's journey to enhanced project management. The model has five stages of project management capability at which the organization can be categorized from the deficient project management process to constant development.

The model comprises of five maturity level which starts from level one "ad hoc", level two "Planned", level three "Managed", level four, "Integrated", and to level five "Sustained" that may initiate in other maturity model processes. Full explanation of these levels are presented and defined in **Appendix C** of this thesis.

b) Qualitative

An open-ended questionnaire as guided by the project management matrix maturity model was used to assess and score seven key research variables to determine the organization project management capability and maturity. These capabilities comprise of: process standards; methods and procedures; decision support; technologies; continuous process improvement; portfolio and resource management; professional development and Knowledge management.

Respondents participated by exploring their thoughts and the application of these project knowledge areas relative to the past or existing projects and/or in the general role. Below is the summary of these competencies:

- Knowledge management – this is the experience and expertise the employee possesses that can make an informed decision in area of project management.
- Process standards, methods and procedures – Does the organization have a standardized adopted project management methodology.
- Technologies – This involves the standardized tools and technology utilization level.
- Decision support – The convenience of well-timed and precise project data can help management to make rigorous commercial decisions.
- Portfolio and resource management – Capacity to concurrently manage all possessions for numerous projects.
- Professional development – Provide prospects for continuous project management training.
- Continuous process improvement – A process that analytically measures group enactment offers a path to developments in assessing, planning, pursuing and reporting project data and recompenses enhancement.

To effectively assess the seven key project capability areas, a total list of 124 interview questions was derived that the respondents were requested to answer. The detailed research instrument which consist of questions per each project capability area is attached in annexure A of this mini dissertation.

The questionnaire assessed project maturity level in Botswana Railways centred on the seven key project capability areas of an excellent project management organisation. The respondents used judgemental recording scheme to record the company's present level of enactment utilizing the Likert scale: "*Ad Hoc; Planned; Managed; Integrated and Sustained*".

3.6 Pretesting the questionnaire

A pre-test refers to a pilot management of a mechanism to detect imperfections. A survey as a data collecting instrument, it is important to regulate questions and guidelines are to the respondents and whether they recognize what is needed from them. The research conducted a pilot study on six respondents at Mahalapye headquarters on selected project managers, project team members, project directors and project stakeholders. However, all participants responded to the interrogations and no question was reformed following the pre-test.

3.7 Ethical considerations

Leading study necessitates not only expertise and determination, but also trustworthiness and reliability. To render the research study ethical, obscurity, confidentiality, self-determination and well-versed consensus were perceived.

Ethical clearance was requested from the university as attached on **Appendix E** of this dissertation. The respondents' consensus was acquired before they finalized the questionnaires. They were informed that they could willingly approve or decline to partake, and to withdraw contribution at any time without consequences. The participants were conversant about the aim of the study, the processes that would be utilized to collect the information, and certain that there were no possible risks or cost included.

Discretion were maintained during the course of the study. Obscurity was guaranteed by not revealing the participant's name on the questionnaire and removing the written consent form. Discretion was sustained by keeping the gathered information intimate and not disclosing the respondents' personalities when reporting or publishing the research.

Systematic honesty is a very important ethical obligation when leading the study. The handling of the information could not be done as self-governing arithmetician entered information from the questionnaire into the SPSS computer software program. The arithmetician produced the outcomes autonomously to evade individual manipulation. The open-ended interrogations that was used for the research was tested by the supervisor for validation of reliability.

3.8 Data analysis

Answers to the research questions were tabulated on the questionnaire were first scored by respondents using a judgement-based scoring system. The entire results under each competency were averaged and recorded among the adopted project maturity matrix model. The data received from the sampled population questionnaire was included in Microsoft Excel spreadsheet. Google survey forms computer software was used as a tool to analyses the data and plot graphs as the outputs of the research questionnaires.

Data were analysed using descriptive statistics method. Frequency tables were drawn and from these information pie charts and bar graphs were presented.

3.9 Summary

This chapter reflected on different proposals and methods accessible for leading a real research. The investigator decided to use a qualitative study by using the project management maturity matrix advanced by the Organizational Government of Commerce, UK. The model outlines five levels that an organization is categorized from deficient project management procedures to constant development.

Data were specifically obtained from the open-ended questions consisting of seven project knowledge areas which the participants will be responding to.

CHAPTER 4: RESEARCH RESULTS

4.1 Introduction

This section presents the findings and analysis resulting from the investigation. It starts by providing the background of the participants by analysing their demographic particulars. This is followed by findings, an analysis of data and the summary. Charts are used to present the data in a reader-friendly way. The chapter presents the data collected to facilitate the discussion, which is presented in Chapter 5.

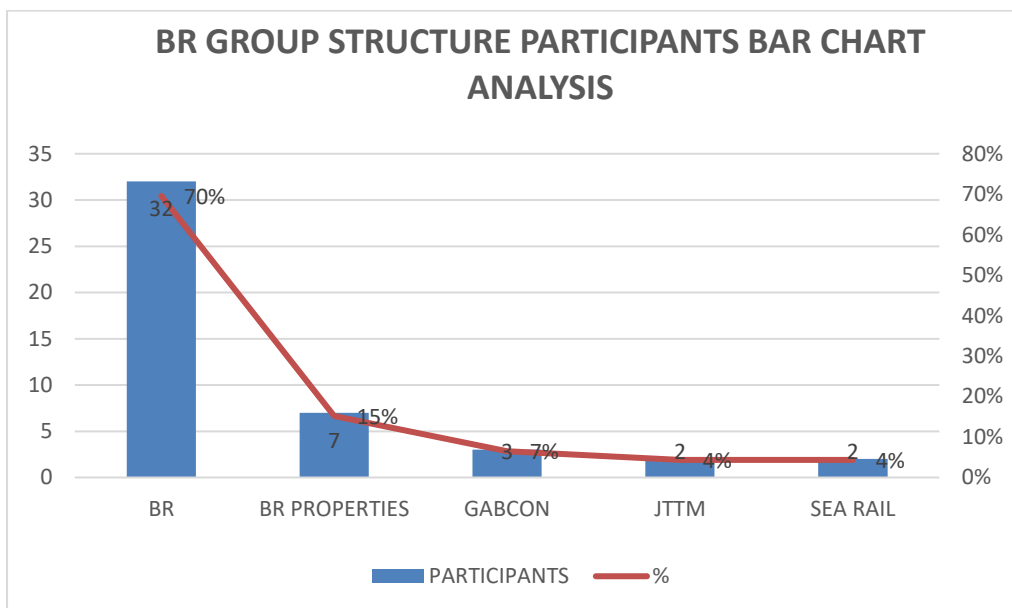


Figure 4.1: BR group structure participants bar chart analysis

The survey targeted 50 potential participants across the BR group structure. Out of these participants, 70% of BR participants responded to the invitation to participate within the time frame. Of these, 15% were BR property employees. This shows that there may have been an unfair distribution of respondents who took part in the research. Few participants from JTTM and Sea Rail responded, both with 4%. GABCON participants responded with 7%. Every group structure was represented, which makes the data provided to be viable.

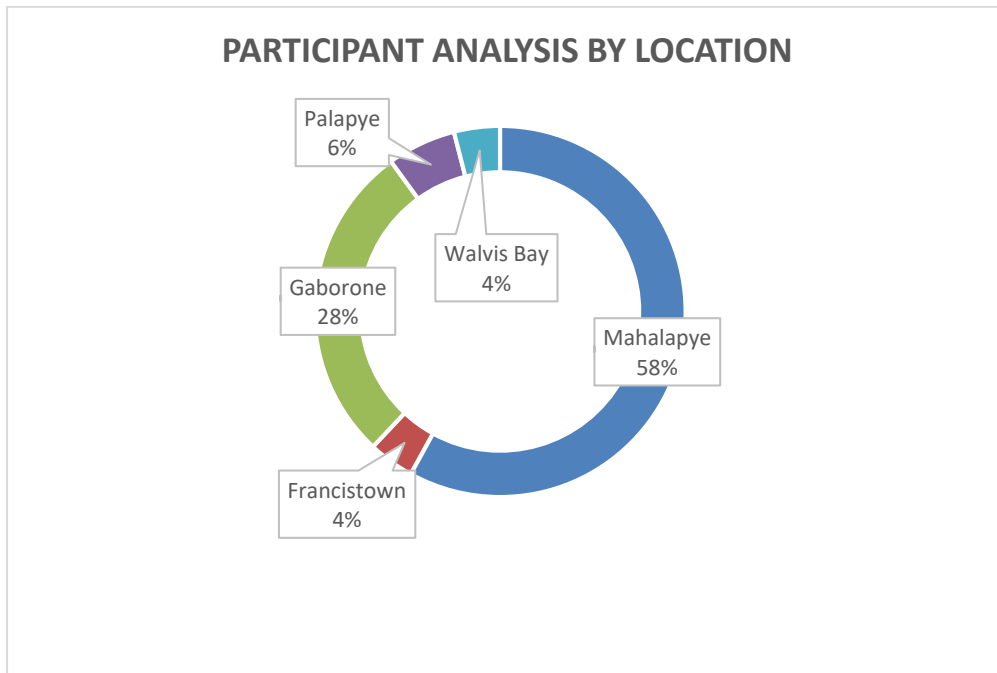


Figure 4.2: Participant analysis by location

The results shown in Figure 4.2 above shows the participants by location chart analysis. The finding from the research indicate that Mahalapye is the dominating place with 58% of the participants, 28% of the participants are based in Gaborone and less than 10% of employees (participants) are based in Francistown, Palapye and Walvis Bay. This specifies that most come from Mahalapye because the administration headquarters of the BR group are situated there.

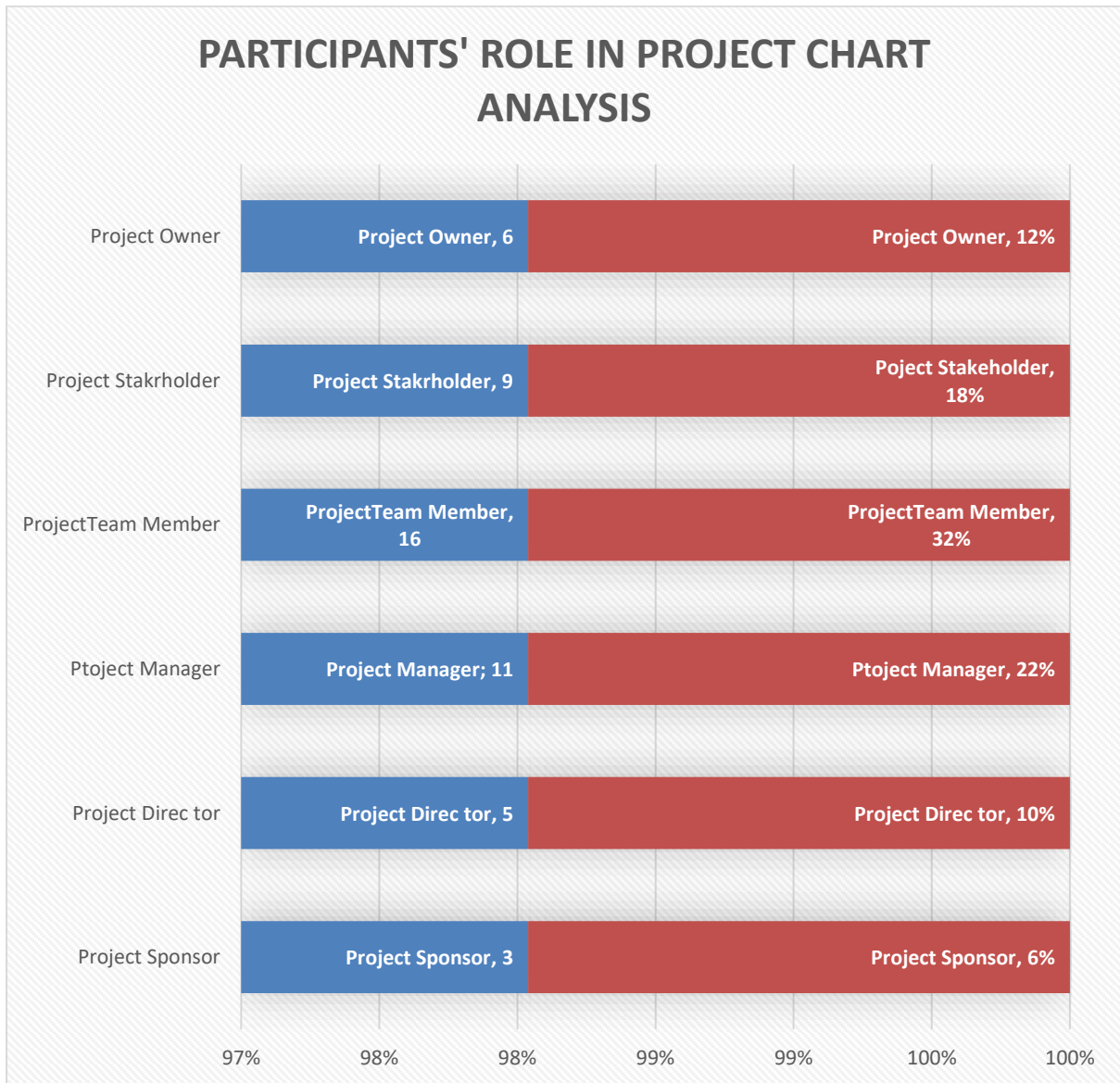


Figure 4.3: Roles in projects chart analysis

The researcher found that most participants were project team members. About 32% of the respondents were project 22%, while project stakeholder participated with 18%. The distribution of participants was fair, even though project sponsors responded at a low rate (6%). This shows the reliability of information provided.

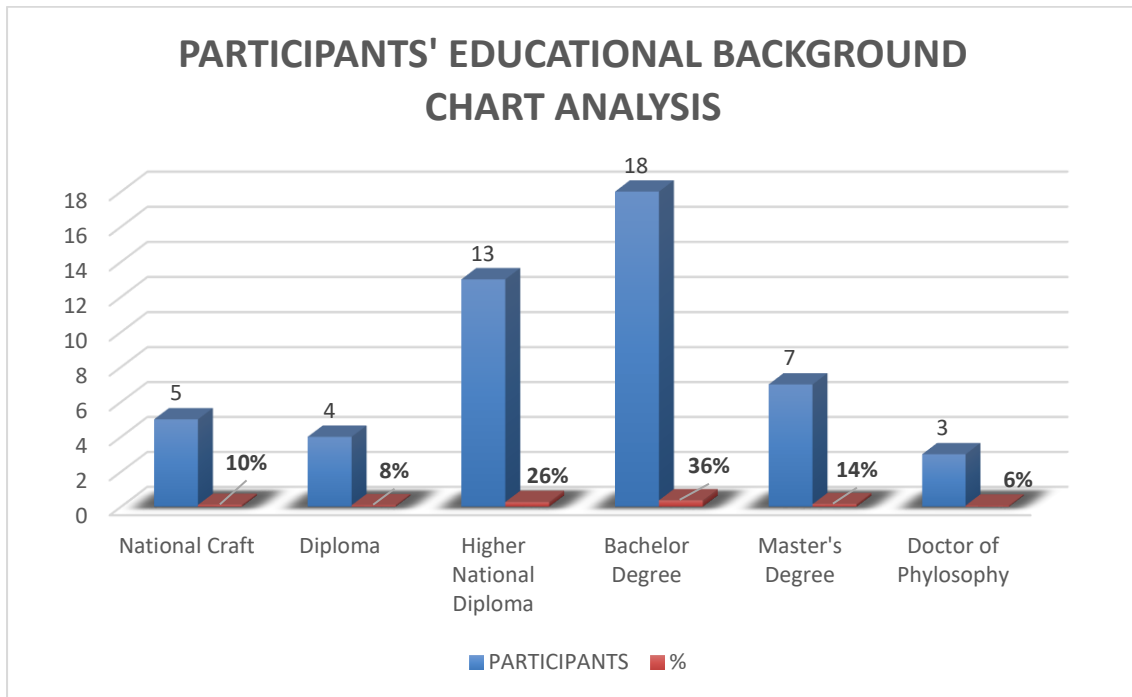


Figure 4.4: Participants Educational Background

The data collected by the researcher reveals that most participants are literate, since 36% of them hold bachelor's degree and 26% of the participants hold a higher national diploma. Participants who hold master's degrees made up 14%, 10% of participants have a National Craft Certificate and fewer than 10% of participants held a diploma and PhD. The data provided was credible as participants understood all questions.

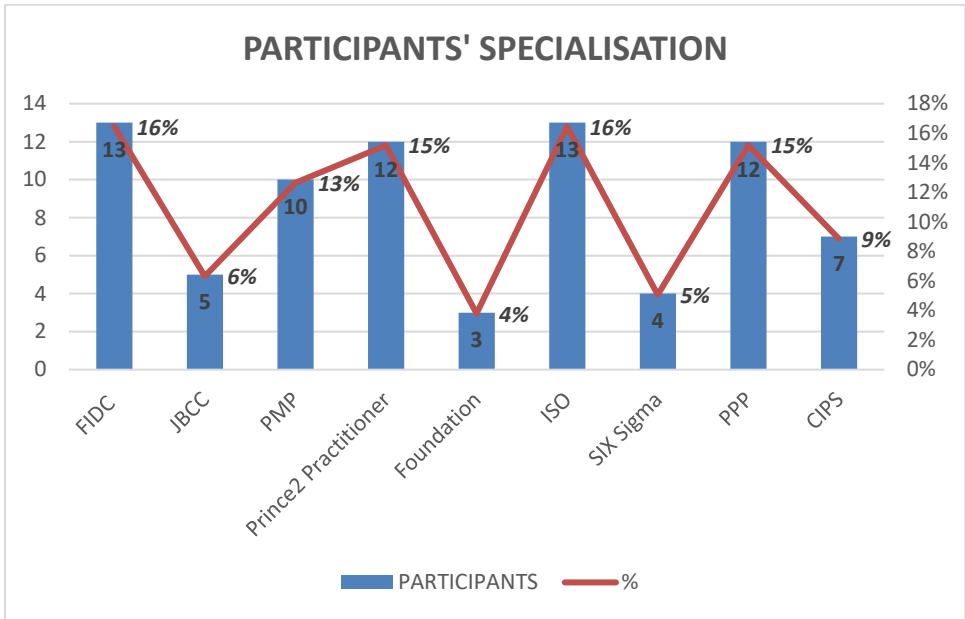


Figure 4.5: Participants' Areas of Specialization

The findings of the research show that participants who specialize on FIDC and ISO responded with 16%, 15% of participants specialized on PPP and Prince2 Practitioner, 13% of the participants specialized on PMP and fewer than 10% of participants specialized on CIPS, JBCC, Six Sigma and Foundation.

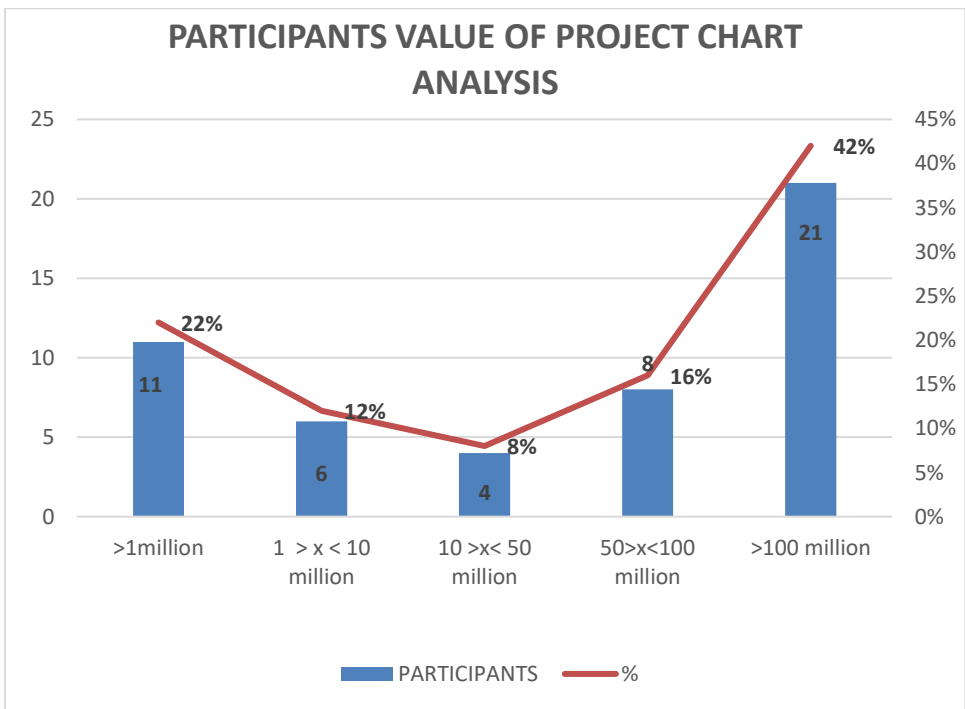


Figure 4.6: Value of Projects Participants Handles

The researcher discovered that most participants (42%) were involved in projects valued at more than 100 million. About 22% of participants were have been engaged in projects that cost more than 1million, 16% of participants have handled projects valued at more than 50 million but less than 100 million. About 12% of the participants were involved in projects valued at more than 1 million but less than 10 million, and lastly, 8% of the participants had been engaged in projects valued at more than 10 million, but less than 50 million. This information shows that the BR group engages in highly capital-intensive projects, amounting to over 100 million pula.

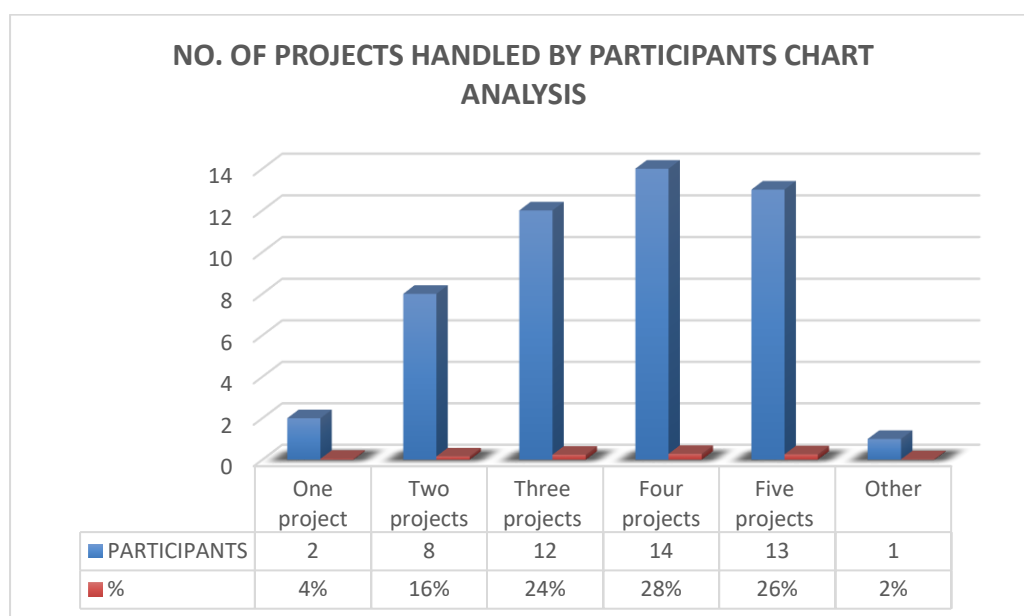


















Figure 4.7: Number of Projects Participants Handles

Of the survey participants, 28% have handled four projects, 26% have handled five projects, 24% have handled three projects, 16% of the participants have handled eight projects and 4% of participants have handled two projects. This shows that participants handle more projects at a given time, which compromises the quality of project management.

The table below shows the average project maturity level of each of the seven research variables. The arrows on the table below specify the current maturity level of project management components.

Table 4.1: Average Research Variables project management Maturity Level

| PROJECT MANAGEMENT RESEARCH VARIABLES | Level 1: "Ad Hoc" | Level 2: "Planned" | Level 3: "Managed" | Level 4: "Integrated" | Level 5: "Sustained" |
|--|---|-----------------------|-----------------------|--------------------------|-------------------------|
| 1.0 Knowledge Management Capability Area |  | 2,16 | | | |
| 2.0 Process Standards, Methods & Procedures Dimension Capability Area | | | | | |
| 2.1 Project Integration Management |  | 2,17 | | | |
| 2.2 Project Scope Management |  | 2,15 | | | |
| 2.3 Project Time Management |  | 2,12 | | | |
| 2.4 Project Cost Management |  | 2,15 | | | |
| 2.5 Project Communication Management |  | 2,15 | | | |
| 2.6 Project Risk Management |  | 2,15 | | | |
| 2.7 Project Quality Management |  | 2,14 | | | |
| 2.8 Project Human Resource Management |  | 2,12 | | | |
| 2.9 Project Procurement Management |  | 2,12 | | | |
| 3.0 Technology Management Capability Area |  | 2,11 | | | |
| 4.0 Decision Support Management Capability Area |  | 2,14 | | | |
| 5.0 Portfolio Resource Management Capability Area |  | 2,14 | | | |
| 6.0 Professional Development Management Capability Area |  | 2,10 | | | |
| 7.0 Continuous Process Improvement Management Capability Area |  | 2,12 | | | |
| OVERALL BR PROJECT MANAGEMENT MATURITY |  | 2,14 | | | |

4.2 CHAPTER SUMMARY

The current chapter presented research outcomes obtained from subjective self-assessment survey.

Figures 4.1, 4.2, 4.3, 4.4, 4.5,4.6,4.7, 4.8 and 4.9 presented the results of self-assessment survey and maturity level, signifying outcomes in the following order:

- Figure 4.1 presents BR group structure participants
- Figure 4.2 indicates participants' analysis by location
- Figure 4.3 represents participants' role in project management
- Figure 4.4 presents participants educational background
- Figure 4.5 represents participants' specialization
- Figure 4.6 represents participants value of project
- Figure 4.7 indicates the number of projects handled by participants
- Table 4.1 represents the average project maturity level matrix

Research results are shown as an averaged total of project management components. The outcomes reflect a project maturity level derived from the subjective response of participants by answering questions put to them.

CHAPTER 5: RESEARCH ANALYSIS

5.1 Introduction

Since Chapter 4 presents the outcomes and findings of a research, the current chapter is focused on analysing and discussing the findings presented in Chapter 4. The findings address the research question of what the current project maturity of BR is and what is required for the organization to achieve higher organizational project management maturity level. The analysis is grounded on the adopted project management maturity model selected from the literature review as attached in **Annexure B** of the research.

The analysis and discussions undertaken in this chapter emphasises the self-assessment investigation, which is quantitative in nature. The primary objective of this research was to measure and evaluate the gradation of project measurement maturity level in BR and identify gaps that will result in project management excellence. The assessment was of help to the researcher as it enabled the researcher to identify areas of maturity level of project management components.

5.2 Analysis of self-administered research questionnaires

To analyse the research results the researcher examined, analysed and interpreted the data from the identified research variables and benchmarked it from adopted project management model matrix. The open-ended questionnaire looked at seven project management capabilities needed for a mature organization. The respondents used a judgement-based scoring system to regulate the current project management maturity of the organization. The following rating system was used;

- Maturity Level 1 ad hoc: The organization have no project management processes.
- Maturity Level 2 Planned: The organization have project management processes which are not being followed.
- Maturity Level 3 Managed: The organization has the project management in place and being followed.
- Maturity Level 4 Integrated: The organization has project management processes in place, they are being followed and continuously audited.

Processes are tracked, reviewed and progress and performance is regulated; identify any areas in which changes to the plan are needed and initiate equivalent changes.

- **Maturity Level 5 Optimized:** At this stage the organization assesses the project management processes through benchmarking and adopts ways to improve them. Lessons learned are frequently observed and used to advance the processes.

The respondents' answers were averaged against each of the project capability areas of organization deemed to be fully matured, the average total scores of project management matrix is found in Table 4.1 above. The researcher interprets the results of this Table 4.1 with the guidance of the adopted project management matrix model attached on **Annexure B**. The seven project management capability areas and sub-components of the research outcomes are discussed below.

5.2.1 Knowledge Management

The organization attained a maturity level of 2.16, representing 43% of the targeted maturity level of 5. This low project management maturity is as a result of approaches and techniques to gather project documents in a central source are well defined. However, there are no proper gate keeping, evaluation and approval of project correlated documents prior to publication.

5.2.2 Process Standards, Methods and Standards

This component consists of the nine-sub-component project capability areas as advocated by the PMBOK. The organization attained an average maturity level of 2.14, representing 43% of the targeted maturity level of 5. This reflects that the organization does not retain the relevant project management capability areas needed for effective application of nine project management knowledge areas. The following is the analysis of each project management component;

- **Project Integration Management:** The organization scored a maturity level of 2.17, representing 43%. Formal project plans are available but only capture small number of tasks, not detailed representing less than 50 tasks and are

applied irregularly. There is no standardized way of coordinating numerous project activities and necessities.

- **Project Scope Management:** The entity attained an average maturity of 2.15, representing 43% of the maturity. The underperformance is attributable to the following aspects: simple scope management prototypes are defined (introducing Work Breakdown Structure), shareholder involvement in requirements, designation and deliverable authorisation, and change management procedures are rarely/occasionally well-defined and organised.
- **Project Time Management:** The organization attained the lowest maturity level of 2.12 representing 42%. Evaluating techniques for time are functional for other projects. Projects program is developed, but neither labour nor cost are base-lined.
- **Project Cost Management:** The organization attained a maturity level of 2.15, representing 43%. Techniques for estimating cost are practised. Non-labour costs are allocated in projects but are not base-lined.
- **Project Communication Management:** The entity attained a maturity level of 2.15, representing 43%. Standardised project report template and status are available but are not reported to senior management. However, instant status is not reported to Senior Management.
- **Project Risk Management:** The entity attained maturity level of 2.15, representing 43%. Risks are familiarly documented in manuscript, not metrics, and Risk identification is not revised regularly. Contingency plans are rarely followed when risks are recognised.
- **Project Quality Management:** The entity attained an average maturity level of 2.14. The organization deploys simple and first entry quality management strategy but is not fully utilised. Stakeholder assessment and authorisation sessions are introduced for vital deliverables only.
- **Project Human Resource Management:** The entity attained an average lowest maturity level of 2.14. The underscoring is because the organization's project assignments are drawn from generic resource pools. Projects are not people- or skillset-specific.

- **Project Procurement Management:** The entity attained a low maturity of 2.12. The organisation conducts simple project budgeting and estimating techniques for projects. The organisation have generic formal procurement.

5.2.3 Technology Management Capability Area

The organization attained an average maturity level of 2.11, representing 42% of the targeted maturity level of 5. The underperformance is detrimental. The organization is using Microsoft Projects scheduling software, but full utilization of the system is a challenge.

5.2.4 Decision Support Capability Area

The organization attained an average maturity level of 2.14, representing 43% of the targeted maturity level of 5. Simple procedures to acquire, accumulate, allocate and present precise needed information required, and information forms and outlines are explained and organised irregularly. Growth processes are available for senior management. There is executive support as they are part of the project steering committee, this is where resource planning and reviewing takes place. According to Kerzener (2000), “visible executive support is necessary for successful project management and the stability of a project”.

5.2.5 Portfolio Resource Management Capability Area

The organization attained an average maturity level of 2.14, representing 43% of the targeted maturity level of 5. Process for allocating resources is not defined. Skills for project managers are not defined, the organisation does not have project resource pool in place.

5.2.6 Professional Development Management Capability Area

The organization attained an average maturity level of 2.10, representing 42% of the targeted maturity level of 5. This is the lowest project management capability area. The organisation is endeavour to have professional development plans for project managers but there is no full management support. Career path/programmes or incentive, recognition and reinforcement programmes are not in place.

5.2.7 Continuous Process Improvement Capability Areas

The organization attained an average maturity level of 2.12, representing 42% of the targeted maturity level of 5. Formal process improvement and procedures are introduced but the organization is not following them because there is lack of a sense of ownership and accountability in the work place and also some procedures conflict with other company expectations which are demanding attention.

5.2.8 Overall Organizational Project Management Maturity Level

The overall organizational project management maturity of BR stands at a maturity level of 2.14, representing 43% of the targeted maturity level of 5. According to the project management maturity model (PMMM), the organization is at *Level 2: Planned Stage*. The burning question is what does it mean if the organization's maturity level is at this stage. The model proves indeed that the organization has some informal project management processes, and are not followed. Informal PM processes are well defined, informal PM problems are acknowledged, informal PM data are gathered. Furthermore (Kerzener, 2000), illustrates that when the organization is at planned stage, it has visible executive support, has executive understanding of project management, establishes project sponsorship at executive levels and is willing to change from doing business as usual.

Dinsmore (1998) disputes that maturity valuation defines the degree in which the organization integrated project management into its operational ways. The project maturity level is influenced by the way organisation conveys its projects. The starting process is to evaluate the organizational maturity level and the necessary capability areas that the organization should embrace to have project management excellence.

The project management maturity model illustrates seven project capability areas for the organization to adopt and implement to be a fully matured organization. This includes knowledge management; process, standards, methods and procedures (according to 10 PMI knowledge areas); decision support; technology usage; portfolio and resource management; professional development and constant process improvement dimensions in BR.

5.3 Summary

BR's project management maturity is at *Level 2: Planned Stage* according to the project management maturity model matrix. The organization is a project-oriented entity as it implements project management to respond to changes in the business environment. The open-ended maturity assessment verified that the organization is taking initiative to adopt the seven capability areas that can lead to project management excellence. The model shows that there are informal project management capability areas that have to be standardized, the executive values the need of the project management, but their visibility throughout the project life cycle is questionable. The organization should engage in change management processes, which is discussed in the next chapter.

The results were compared to the aim of the study and the research questions. The primary research question was to determine the organizational project management maturity level of BR. The question was answered, and a standardized universally accepted maturity model was used during the process. Sub-research questions supported the main research questions. These were based on capability path areas required for project management to achieve a higher organizational project management maturity level. After an intensive literature review the adopted maturity model was chosen, including the seven paths, namely knowledge management; process; standards, methods and procedures (according to 10 PMI knowledge areas); decision support; technology usage; portfolio and resource management; professional development and constant process improvement. The last research question was whether the degree of organizational project maturity could be utilized as a measure of the overall accomplishment as well as the efficiency of project management within BR. Maturity is one of the key topics that measure excellent performance and will lead to either success or failure (Tobin, 2004). Numerous maturity models have been introduced in PM (Pennypacker & Grant, 2003). These models try to measure an organization's PM Maturity level through a ranking system based on the degree that dissimilar practices, procedures and abilities are in place (Griffith, 2006).

The outcome of the self-administered project management maturity assessment survey shows that BR has great amount of work to ensure improvement of the project management maturity level.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The aim of this study was to assess the project maturity level of BR using a standardized questionnaire. The research instrument was adopted from the project management maturity model. The model is retained by Axelos, a joint venture of the UK Government and Capita, which took possession of the resource in January 2014. Prior to this, P3M3 was retained by the Office of Government Commerce (OGC). The outcomes of the research were presented in the 4th Chapter and interpreted in the 5th Chapter. conclusions and recommendations for future study are presented in this chapter.

6.2 Conclusions

6.2.1 The Maturity Level of Botswana Railways

According to the project management maturity model (PMMM) the organization is at *Level 2: Planned/Managed Stage* of the maturity ladder. The project characteristics of a project is often reactive. The characteristics of this maturity level is indicated in Figure 6.1 below.

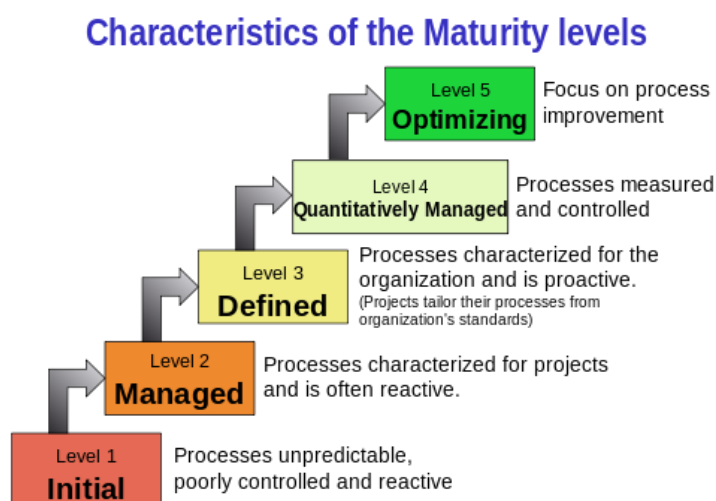


Figure 6.1: Characteristics of the maturity levels

This maturity level means that the organization encounters risk on the delivery of projects. The envisioned quality and intended project results or objectives are rarely

met. The results of the research are mapped in Table 4.1 of the project management maturity matrix.

6.2.2 Knowledge Management

Approaches and methods to gather and store project related documentation in a central source or database are well defined. However, there is no proper storage, review and approval of project-related documentation prior to publication.

6.2.3 Process Standards, Methods and Standards

The organizations ensure that each project has its own processes and procedures and follow minimum specified standard. There is limited consistency and coordination between projects.

6.2.4 Technology Management or Project Management Systems

The organization uses the Microsoft Projects scheduling software, but full utilization of the system is a challenge. There is no enterprise-wide project management system in use where project and programme data can be accessed in real time.

6.2.5 Decision Support

The organization's executives value project management and projects are seen as change agents to respond to the ever-changing business environment. The executive management forms part of the steering committee, but their commitment to a given project is minimal. There is no formal project management life cycle with standard and proper gate keeping, review and approval. The management of the project usually lies with the project owner, which defies the notion of the project as a multi-stakeholder arrangement that requires a project management organizational structure.

6.2.6 Portfolio Resource Management

The allocation of resources is reactive, and decisions lack an integrated resource and assignment tracking system. The productivity level measurement of the resource is not adequate. There is no performance management of the team during project management. The organization does not have robust portfolio resource management systems.

6.2.7 Professional Development

The mandate of project management is explained, and professional development plans are acknowledged. The organization has little commitment to enhancing and cultivating project management skills. There is no training opportunities or existing project management development career paths. Contemporary organizations recognize continuous professional development as an essential core competency that requires their employees to respond to the ever-changing technological disruptions.

6.2.8 Continuous Improvement

The organization embraces and acknowledges formal process improvement and procedures but lacks implementation. Continuous improvement is embraced as a fundamental principle, making it possible for organizations to adapt and change to the ever-changing business environment. Organizations are challenged to do more with less to improve its project management. The global forces cause companies to compete for strained resources. For their survival, companies have to embrace continuous improvement. Lessons learned by the project team during the lifecycle may be the foundation of best practice for an organization. The organization does not document and refer to the lessons learned on its project management.

6.2.9 Best Practices Summary

BR project management and pre-eminent practices enclosed in project management matrix model were compared in this research. The organization does not meet the minimum best practices on the following areas:

- Lack of effective internationally recognized organization-wide project management policy with standardized processes, procedures and templates
- Lack of project organizational structure with defined roles and responsibilities
- Lack of project controls in the event of scope, schedule and cost variations
- No defined organizationally adopted enterprise project management system
- No procedure for identification, documentation and implementation of lessons learned
- Lack of adopted project risk management strategy, which consists the tolerance risk level, contingency allowance etc.

- There is no project performance management among the project team that consists of recognition and awards criterion
- There is no proper and effective selection and training criteria of project managers
- BR does not have well-coordinated resource planning and allocation management with effective senior management support

6.3 Recommendations

BR is managing a portfolio of capital intensive, complex and sophisticated projects. They require unique systems, processes and technical capabilities. Therefore, delivering a project that meets the project constraints and intended project objectives requires effective and excellent project management. Every organization's interrogations include: "Are we achieving the results we desire?"; "Are we meeting the objectives of our project?"; "Are we meeting our customer's success criteria?", besides "Are we achieving our desired return on investment?" (Florac *et al.*, 1997:1). The key results shown above and the robust recommendations that follow offer a stepping stone that could catapult BR to the third level of maturity ladder.

Level 3 on the maturity ladder is *Planned/Managed*. In this case the organization has a standardized project management methodology and individual projects flex within these processes to suit the particular project. At this level the organization starts to reach a standardized and systematic expression of the five core dimensions of the maturity model. The organization is proactive in resource allocation, and the project benefits are predetermined in the form of a business case. The organization invests in individual performance improvement and career paths are well defined. The effects of changes are accounted, and a plan is made for how the changes will be executed to maximize the benefits. In summary, the maturity level is characterized by the following: all project management standards, processes, methods, procedures and staff are in place as organizational standards. Formal documentation exists, consistent management support, execution irregularly/inconsistently applied. However, when the organization is on Level 3, it does not have the adequate technology and tools to be used for intelligent analysis during decision making.

In order to deal with the specified findings mentioned above on the identified project management capability that the organization has to embrace to create a successful project management culture, the following recommendations have to be undertaken;

6.3.1 Knowledge Management: The Organization should Build a *Project Management Centre of Excellence*

At Level 3, project management is shared within the entire organization and the organization understands and functions as project-oriented organization (POO). The field of project management has expanded its emphasis on a single project to the way the organization utilises projects to attain its aims. Gareis (1989) invented the concept of the project-oriented organization (POO) long time ago. According to Kerzner (2000:16), the difference between an average company and the company that has attained excellence in project management is the way growth and maturity phases of the project management life cycle are executed. The 21st century contemporary organization considers and implements six key areas (integrated processes, culture, management support, training & education, informal project management & behavioural excellence) that successful companies adopt to excel in project management. It is therefore recommended that the organization should invest in these six components to attain the project management excellence and this cannot be successful without proper senior management support.

6.3.2 Process Standards, Methods and Procedures

BR has to benchmark from an international recognized project management methodology as a guiding tool for development of project management policy framework. The policy should include processes, procedures, gate review stages, standard templates, tools and techniques. The methodology should include all ten project knowledge areas as advocated by PMBOK.

6.3.3 Project Management Information Systems

The literature review explored the value of technology in project management. The organization has to invest in an organization-wide project management system, this will facilitate real-time scheduling and tracking for the informed decision. The organization will be in the position to determine the status and performance of portfolio

management on a real-time basis. There are available world acclaimed project management technologies such as Oracle Primavera which BR can adopt. Oracle Primavera is the Project Portfolio Management Powerful Tools for Global Project Planning and Managing projects of any size with this cloud-based, robust, and easy-to-use solution for globally prioritizing, planning, managing, and executing projects, programs, and portfolios.

6.3.4 Decision Support

It is the main duty of the organization's executive to cultivate a conducive working environment that facilitates project management excellence. Top management decides organisational strategy that helps the organization to improve performance in terms of growth and profitability. Management support plays a critical role that drives the implementation of the project and meeting set goals within the organization. According to Kerzener (2000), "visible executive support is necessary for successful project management and the stability of a project".

Therefore, the researcher recommends that techniques to acquire, accumulate, allocate and present precise project information, and data forms and patterns should be developed and deployed regularly and consistently. A summary status should be reported to senior management. All projects should have a Steering Committee or Project Board consisting of directors as project sponsor, senior user and senior supplier. The members of the Steering Committee should be senior within the organization to make strategic decisions about the project and ensure project returns on investment. They are responsible to provide resources such as personnel, cash, training requirement and equipment for the project. This ensures that the project is focused throughout the life cycle and subsequent approvals are done well on time.

6.3.5 Portfolio Resource Management

At maturity "Level 3", procedures are organized for conveying resources regularly and consistently. Skills and capabilities are identified and sourced from all disciplines irregularly. Projects may be abridged to pre-established, mutual stages. Formal, quantifiable measures (KPI's) are defined to decide whether projects can go through pre-defined "gates" to make progress to the next stage (or phase) of the project. In

view of the above characteristics, the organization should have a project management office that consists of talented and qualified project managers who are tasked with the delivery of strategic portfolio of projects. Currently the organization is faced with the resource constraints where project managers are chosen from the individuals who are engaged on the business as usual activities. This results in a lack of commitment to daily project management requirements. There should be a project performance management system that includes appropriate rewards and reinforcement. Rewards represent a very persuasive tool to influence employee behaviour on the job, especially the set of rewards over which management has direct control.

For the project management system to give the organization effective results, the organization should employ project controls. Project controls are concerned with estimating initial baseline performance metrics, determining the current status of the project, estimating the future potential of the project, identifying any variances (baseline to current position and baseline to potential future position), and considering appropriate action to recover any positive variance. It is recommended that the project management office must have project controls professionals.

6.3.6 Continuous Improvement

The organization should embrace a culture of continuous improvement as an endeavour to respond to change, agility is the critical factor that distinguishes successful companies from the average companies. The organization should deploy cultural change programmes for the recommendation identified above to be implemented without any organizational resistance.

6.3.7 Professional Development

The organization should establish a training programme for all project managers. It is the employee's own responsibility to develop themselves, but the organization should provide incentives and study loans for this individual. The recruitment of project managers should be based on their qualifications as certified project managers and continuous professional development should be included on their career path. Kerzener (2000) advocates for training to build project management knowledge faster in the organization, improving corporate proficiency and effectiveness. Further,

training and education result in improved job performance and team well-being (Aguinis & Kraiger, 2009).

6.4 Conclusion

The list of recommendations mentioned above requires management support as some requires finance. Upon implementing these recommendations, the organization will improve its project maturity level. It will reach project management excellence and become a benchmark for other companies. The most important aspect of the recommendations is to first introduce the relevant recognized organizational adopted project management methodology.

6.5 Recommendations for future research studies

The researcher focused on the assessing the project management maturity of Botswana and research was focused on determining the how maturity can affect the organization project management. However, the researcher is of the view that it is important that academics and project management professionals to conduct future research on the following:

- Research is required to identify various project management maturity models, evaluate them and to determine the maturity model of the railway industry.
- Research is needed to determine project management maturity level in similar railway companies. This information will be useful to guide the organization in reaching the ultimate maturity level.

BIBLIOGRAPHY

1. Aguinis, H. and Kraiger, K., 2009. Benefits of training and development for individuals and teams, organizations, and society. *Annual review of Psychology*, 60, pp.451-474
2. Anantatmula, V. S. (2008). The role of technology in the project manager performance model. *Project Management Journal*, 39(1), 34–48.
3. Anderson, E.S., and Jessen, S. A.2003. 'Project maturity in organizations', *International Journal of Project Management* 21(3): 457–461.

4. Baranskaya, A.2007. Project Management in Public Administration of Transitional Countries. Moscow State University, School of Public Administration, Russia.
5. Bryman, A & Bell, E (2014). Research Methodology – Business and Management Contexts. Third Edition. Cape Town: Oxford University Press
6. Cooke-Davies, T., 2004. Project management maturity models. *The Wiley guide to managing projects*, pp.1234-1255.
7. Cooke-Davies, T.J. and Arzymanow, A. (2003) the maturity of project management in different industries: An investigation into variations between project management models. *International Journal of Project Management*, 21, 471 – 478.
8. Cooke-Davies, T.J., Crawford, L.H. and Lechler, T.G., 2009. Project management systems: Moving project management from an operational to a strategic discipline. *Project Management Journal*, 40(1), pp.110-123.
9. Crawford, J. K. 2002. 'Project Maturity Model: Providing a Proven Path to Project Management Excellence': PM Solutions.
10. Crawford, J.K. (2007). Project Management Maturity Model, Second Edition. Boca Raton, FL: Auerbach/CRC Press.
11. Crawford, J.K., 2006. *Project management maturity model*. Auerbach Publications.
12. De Wit, A. 1999. 'Measurement of project success', *Project Management*, 6(3): 164-170.
13. Dinsmore, P.C.1999. *Winning In Business with Enterprise Project Management*. First Edition. New York: American Association.
14. Drey, M., Pfeifer, K., Sieber, C.C. and Bauer, J.M., 2011. The Fried frailty criteria as inclusion criteria for a randomized controlled trial: personal experience and literature review. *Gerontology*, 57(1), pp.11-18.
15. Eisenhardt, K.M and Galunic D.C. 2000. 'Coevolving at last, a way to make synergies work', *Harvard Business Review*.
16. Eisenhardt, K.M., and Brown S. L. 1998. *Competing on the edge: Strategy as structured chaos*. Harvard Business School Press, Boston, Massachusetts.
17. Fengyong, Z. & Renhui, L. (2007). Study on framework of construction project management maturity model. USA: IEEE, July, (pp. 1-4)

18. Florac, W.A., Robert, E. & Carleton, A.D. 1997. *Practical software Measurement: Measuring for process Measurement and improvement*. Carnegie Mellon University, Software Engineering Institute, Pittsburgh, PA. (Technical Report CMU/SEI-97- 003).
19. Gareis R. Management by projects: the management approach for the future. *International Journal of Project Management* 1989; 7(4):243–9.
20. Gareis, R. 2000. 'Competences in the Project-oriented Organizational', Project management Group.
21. Gareis, R. and Huemann, M. 2000. 'Assessing and Benchmarking Project-oriented Societies, in Project Management', *International Project Management Journal*, Project Management Association Finland, Norwegian Project Management Forum, 7 (1): 14-25.
22. Gareis, R. and Huemann, M., 2000. Project management competences in the project-oriented organization. *Gower handbook of project management*, JR Turner and SJ Simister (ed.), Gower, Aldershot, 709-721.
23. Graham, R.J. and Englund, R.L. 2004. *Creating environment for successful projects*. Second Edition. USA: Jossey-Bass.
24. Griffith, A.F. (2006). Improving Project System Performance through Benchmarking. Proceedings of the PMI global congress, Madrid, Spain. Hillson, D. (2003) Assessing organizational project management capability. *Journal of Facilities Management*, 2(3), 298 – 311.
25. Humphrey, W.S., 1999. Pathways to process maturity: The personal software process and team software process. *SEI Interactive*, 2(2), pp.1-17.
26. Ibbs, C.W. and Kwak, Y.H., 2000. Assessing project management maturity. *Project management journal*, 31(1), pp.32-43.
27. Kerzner, H (2005). Strategic planning for project management using a project management maturity model. New Jersey: John Wiley & Sons.
28. Kerzner, H. (2006). *Project Management: A systems approach to planning, scheduling and controlling*. Ninth edition. New Jersey: Wiley.
29. Kerzner, H., 1998. *In search of excellence in project management: Successful practices in high performance organizations*. New York, NY: van nostrand reinhold.

30. Kerzner, H., 2002. Strategic planning for project management using a project management maturity model. John Wiley & Sons.
31. Kerzner, H., 2003. Strategic planning for a project office. *Project Management Journal*, 34(2), pp.13-25.
32. Kerzner, H., 2004. *Advanced project management: Best practices on implementation*. John Wiley & Sons.
33. Kerzner, H., 2011. *Using the project management maturity model: strategic planning for project management*. John Wiley & Sons.
34. Kwak, Y.H. and Ibbs, C.W. (1995) *Financial and organisational impacts of project management*. University of California, Berkley, USA.
35. Kwak, Y.H. and Ibbs, C.W. (2002) Project Management process maturity (PM) 2 model. *Journal of management and engineering*, 18(3), 150 – 155.
36. Levin, G. and Skulmoski, G. 2000. 'The project management maturity', *ESI Horizons*, 2(3): 1–7.
37. Maxwell, J.A., 2012. *Qualitative research design: An interactive approach* (Vol. 41). Sage publications.
38. Mugenda, A (2003) *Research methods: Quantitative and qualitative approaches*: Olive M Publication African Centre for Technology Studies.
39. Nokes, S. & Kelly, S. (2007). *The definite guide to project management: The fast track to getting the job done on time and on budget*. Second edition. London: Prentice Hall.
40. OGC (Office of Government Commerce). (2006). *PRINCE 2 Maturity Model*. London: Crown
41. Pennypacker, J. S. (ed.) (2005). *PM Solutions' project portfolio management maturity model*. Havertown, PA: Center for Business Practices.
42. Pennypacker, J.S. and Grant, K.P., 2003. Project management maturity: An industry benchmark. *Project Management Journal*, 34(1), pp.4-11.
43. Peters, T. 1999. *From Excellence to "The Work Matters"*. Lessons in Leadership. Training Education Network. Strubenvally.
44. PMI. 2006. *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*. 4th ed. Newtown Square, Pennsylvania, USA: Project Management Institute, Inc.

45. Project Management Institute, 2008. Organizational Project Management Maturity Model (OPM3): Knowledge Foundation. Project Management Institute.
46. Rwelamila, P.M.D., 2007. Project management competence in public sector infrastructure organisations. *Construction Management and Economics*, 25(1), pp.55-66.
47. Schleicher, A., 1999. *Measuring Student Knowledge and Skills: A New Framework for Assessment*. Organisation for Economic Co-Operation and Development, Paris, France (US \$26). Web site: www.oecd.org.
48. Schlichter, J. 1999. 'Surveying Project Management Capabilities', PM Network, 13(4).
49. Sonnekus, R., and Labuschagne, L. 2004. Establishing the relationship between IT project management maturity and IT project success in a South African context: Proceedings of the 2004 PMSA Global Knowledge Conference, Johannesburg, South Africa, 183-192.
50. Steyn, H., Sparrius, A., Dekker, A.H., Kuschke, B., Van Eck, B.P.S. and Visser, K., 2016. *Project management: A multi-disciplinary approach*. FPM Publishing.
51. Thamhain, H. (1999). Effective project leadership in complex self-directed team environments. *Proceedings of the 33rd Hawaii International Conference on System Sciences, IEEE Computer Society* (pp. 7064–7085).
52. Tobin, P.K.J. (2004) World – class knowledge management: a proposed framework. *South African Journal of Information Management*.
53. Turchin, P., 2003. *Complex population dynamics: a theoretical/empirical synthesis* (Vol. 35). Princeton university press.
54. Webster. The new lexicon Webster's dictionary of the English language 1988 Edition. NY: Lexicon Publications; 1988.
55. Wysocki, R.K., 2011. *Effective project management: traditional, agile, extreme*. John Wiley & Sons. London
56. Zikmund, W. G (2003). *Business Research Methods*, 7th edition. USA: Thomson (South-West)

ANNEXURES

ANNEXURE A: DATA COLLECTION TOOL

Questionnaire Template

Please fill in your answer by ticking the box next to your preferred response and where extra space is provided you can substantiate your answer as far as the space given

allows. Do not put your name or any personal identification mark to preserve your anonymity.

Section 1- Respondent Particulars

1. Employer details:
 - a. Company name: [Click here to enter text.](#)
 - b. Location: [Click here to enter text.](#)
2. Role in projects

Project Sponsor

Project Director

Project Manager

Project Team Member

Project Stakeholder

Project Owner

Specify Type [Click here to enter text.](#)

3. Educational Background

National Craft Certificate

Diploma

Higher National Diploma

Bachelor Degree

Master's Degree

Doctor of Philosophy

Other

4. Specialisation

Contract Management

FIDIC Conditions of Contract

JBCC

Other

Please Specify: [Click here to enter text.](#)

Project Management

PMP

Prince2

Foundation

Practitioner

Other

Please Specify: [Click here to enter text.](#)

Quality Management (eg six sigma, ISO)

Please Specify Click here to enter text.

Risk Management

Please Specify Click here to enter text.

Procurement

Please Specify Click here to enter text.

Public Private Partnerships

Please Specify Click here to enter text.

Other

Please Specify Click here to enter text.

5. Value of projects you have individually worked on in last 3 years.

Less than million

More than 1 million less than 10 million

More than 10 million less than 50 million

More than 50 million less than 100 million

More than 100 million

6. How many projects are you individually working on or involved during this financial year?

One project

Two projects

Three projects

Four projects

Five projects

Other

Please Specify [Click here to enter text.](#)

BOTSWANA RAILWAYS PROJECT MANAGEMENT MATURITY QUESTIONNAIRE

Project management maturity is the extent to which the organization has incorporated project management into its way of working. The organization maturity can be ranked between Level 1 (adhoc), Level 2 (Planned), Level 3 (Managed), Level 4 (integrated) and Level 5 (Sustained).

Maturity Level 1 Adhoc: The organization doesn't have project management processes

Maturity Level 2 Planned: The organization have project management processes are not being followed.

Maturity Level 3 Managed: The organization has the project management in place and being followed.

Maturity Level 4 Integrated: The organization has got project project management processes in place, are being followed and continuously audited. Processes are tracked, reviewed and progress and performance is regulated; identify any areas in which changes to the plan are required and initiate corresponding changes.

Maturity Level 5 Optimized: At this stage the organization evaluates the project management processes through benchmarking and decides ways to improve them. Lessons learnt are regularly examined and used to improve the processes.

Below you will find questions concerning how you believe and perceive the organization maturity level stands, from a project management point of view. You are kindly requested to determine the level of project management maturity level among the following seven key project management capability areas. Please indicate your choice by selecting one option per question.

| 1.0 Knowledge Management Capability Area | | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 1.1 | Do formal methods exist to collect, store and share project related information and documentation? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1.2 | Is there a central project and programme data repository, to capture critical project and programme information, metrics, and lessons learned, and is it maintained? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1.3 | Are formal gate keeping, review and acceptance of project related documents rolled out across all projects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1.4 | Are there formal procedures to organize, file, and store information of completed projects? Can this information easily be searched and used by everyone? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1.5 | Is there a requirement for Lesson Learned reports? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1.6 | Is there formal standardized project management process, procedures and/or policy which is adopted by the organization? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1.7 | Totals | | | | | |
| 1.8 | Average | | | | | |

2.0 Process Standards, Methods & Procedures Dimension Capability Area

| 2.1 Project Integration Management | | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.1.1 | To your knowledge, how many projects are there with and without plans (project Manager, Scope, Timeline, Risk assessment, Budget, etc.). | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.2 | Is a project plan that contains appropriate project information developed and approved for every project? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.3 | Do standard methods and procedures exist for project development life cycles? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|-------------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 2.1.4 | Are Project Management standard methods and procedures and product development life cycle processes effectively integrated? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.5 | Do you track issues? If so, do you have periodic meetings to review and update project issues? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.6 | Are sponsors and other stakeholders involved in setting a direction for the project that will affect all stakeholders | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.7 | Are there formal procedures to assure that information is shared correctly and all decision makers have the appropriate level of information? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.8 | Is there a project charter that contains appropriate project information developed and approved for every project setting and defining goals, objectives and scope? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.9 | How are project goals defined, agreed and recorded? Is there a system to prioritize project goals and objectives? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.10 | Is the project manager assigned early in the project, prior to the start of project plan execution? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.11 | Are formal change management processes applied consistently? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.1.12 | Totals | | | | | |
| 2.1.13 | Average | | | | | |
| 2.2 Project Scope Management | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.2.1 | Are formal scope definition, collect requirements and documentation processes applied to all projects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.2.2 | Are complete work breakdown structure templates in place with documented guidelines, tools, techniques, and updates? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.2.3 | Are structured, joint development sessions conducted periodically throughout the life cycle of the project, as appropriate? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.2.4 | Are acceptances criteria clearly defined and include quantifiable deliverables and/or pre-defined service levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 2.2.5 | Is there a process for confirming that all deliverables have been accepted? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.2.6 | To your knowledge how many projects did completed meeting the initial scope without any scope variations? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.2.7 | Totals | | | | | |
| 2.2.8 | Average | | | | | |
| 2.3 Project Time Management | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.3.1 | To your knowledge, how many projects have been delivered on time out of the total number completed over the last 3 years? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.2 | To your knowledge, how many projects are there with and without schedules (Time line for task and deliverable completion)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.3 | Is a complete activity sequencing process in place that involves the identification of dependencies to create a project network diagram? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.4 | Are projects base-lined to allow tracking of variances? If so, at what level (phase, task, sub-task/detail)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.5 | Are estimating techniques for time applied – both duration and effort? If so, which technique is more often used? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.6 | Are project tracking processes defined and operating, where actual progress is posted to project plans (tracked for labor or schedule)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.7 | Is labor tracked only at the project summary level or at the task level of detail? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.8 | Is critical path used in optimizing the schedule? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.9 | When a project is completed, is the total actual total duration known? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.10 | As part of the project tracking process, is actual work effort collected and posted to project plans? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3.11 | Are various defined estimating processes and models including historical data, top-down and bottom-up estimating and trend | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | analysis in place to determine and/or improve task effort and task duration estimates? | | | | | |
| 2.3.12 | Totals | | | | | |
| 2.3.13 | Average | | | | | |
| 2.4 Project Cost Management | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.4.1 | To your knowledge, how many projects have been delivered on budget out of the total number completed over the last 2 years? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.2 | Are estimating techniques for cost applied? If so, which technique is more often used? Is there a repository data system? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.3 | Are project costs estimated for all resources that will be charged to a specific project? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.4 | Is an initial estimate developed or are estimates directly developed based on the scope document (WBS)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.5 | Are cost and labour tracked separately (double entries) because of lack of integration with accounting systems? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.6 | Are change control processes for budget revisions applied? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.7 | Are costs tracked only at the project summary level? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.8 | Are resources tracked to the lowest level of the project work breakdown structure? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.9 | When a project is completed, is the total cost known? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.10 | Is a structured cost control system in place, including fully automated tools, revised budgets, and corrective action plans? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.11 | Totals | | | | | |
| 2.4.12 | Average | | | | | |
| 2.5 Project Communication Management | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.5.1 | To your knowledge, how many projects are there with and without communication plans (Formal description of what project | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|------------------------------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | information should be circulated, when, how and to whom)? | | | | | |
| 2.5.2 | Is there development and maintenance of a project folder consisting of key project documents such as project charter, mission statement, WBS, responsibility matrix, schedules, status reports, issues log and project controls or change management plans? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.5.3 | Are there processes in place to receive, log and resolve project issues/problems in a timely manner with team members and stakeholders? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.5.4 | Are scheduled and regular project status meetings held involving team members for the purpose of communicating project progress and status? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.5.5 | Are the information needs of the stakeholders analyzed; with communication taking place on a regularly scheduled basis and in a specified format (report, presentation, etc.)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.5.6 | Do all project stakeholders (customer, technical, vendor, management) receive the communications? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.5.7 | Is the overall status of the project published to all project stakeholders? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.5.8 | Totals | | | | | |
| 2.5.9 | Average | | | | | |
| 2.6 Project Risk Management | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.6.1 | To your knowledge, how many projects are there with and without risk plans (Formal descriptions and management plans of project risks)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.2 | Is there a process in place to identify, analyze, respond, monitor and control project risks? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.3 | Are risk responses documented and mitigation strategies and contingency plans incorporated into the project plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.4 | Is a change budget or contingency reserve incorporated into the project budget based on risk? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|---------------------------------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 2.6.5 | Is the risk assessment process built into the ongoing project management and tracking process? At what point in the life of a project does this start happening? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.6 | Are risks continuously reassessed and updated throughout the life of the project? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.7 | Are risks quantified in terms of probability and consequence of occurrence, and prioritized based on these risk scores? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.8 | Are risk events identified and assessed using historical data, team experience and other defined criteria? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.9 | Is there a database for risks typologies and/or mitigation strategies? Are risks appropriately documented when a given project risk item is closed? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.10 | Is there a risk management software tool in use? If so, is it integrated with the project management software tool(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.11 | Are metrics used to measure probability and impact formally applied across all projects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6.12 | Totals | | | | | |
| 2.6.13 | Average | | | | | |
| 2.7 Project Quality Management | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.7.1 | Is a project quality management plan developed to describe how the team will implement its quality policy and includes responsibilities, procedures, processes and resources necessary to implement quality management activities? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.7.2 | Are the project's key stakeholders involved in the inspection and approval of processes? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.7.3 | Are quality assurance activities implemented and enforced to ensure that the project will satisfy the relevant quality standards (process and deliverables acceptance criteria)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.7.4 | How is product quality assessed after project completion? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.7.5 | Are quality metrics used to identify defects in the process, and used to improve the process? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|--|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | | | | | |
| 2.7.6 | Totals | | | | | |
| 2.7.7 | Average | | | | | |
| 2.8 Project Human Resource Management | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.8.1 | Is there a process defined for identifying, documenting and assessing project roles and responsibilities and for determining resource loading? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.8.2 | Are project assignments drawn from a generic resource pool? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.8.3 | Are definition of project roles (sponsor, team member, stakeholder), and responsibilities documented, communicated and reviewed throughout the life cycle of the project? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.8.4 | Are specific skill sets identified for defined project roles? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.8.5 | Are there guidelines pertaining to the availability, scheduling and communication to facilitate team formation, team building interaction and development? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.8.6 | Are formal project reward and recognition systems to promote or reinforce desired behaviour and make the link between project performance and the reward clear, explicit and achievable? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.8.7 | Are demand and capacity historical metrics utilized to improve HR planning and forecasting? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.8.8 | Totals | | | | | |
| 2.8.9 | Average | | | | | |
| 2.9 Project Procurement Management | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.9.1 | Are cost projections used to anticipate procurement needs? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.9.2 | Is there basic project cost budgeting and forecasting for materials? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.9.3 | Is there a defined procurement plan with a defined statement of Work template? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|--|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 2.9.4 | Are standards defined for contract deliverables, delivery and acceptance criteria and post-delivery support and maintenance? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.9.5 | Is there a selection process defining the monitoring and evaluation guidelines for contractors? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.9.6 | Is the management of contracts, guidelines for contract changes, and the renegotiations of contracts a well-defined process? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.9.7 | Is there a process of vendor qualifications? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.9.8 | Totals | | | | | |
| 2.9.9 | Average | | | | | |
| 2.10 Project Stakeholder Management | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 2.10.1 | Is there a process during project initiation phase where the major stakeholders are identified and their concerns established? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.10.2 | Is there stakeholder management plan which lists each stakeholder and prioritizes their concerns and potential impacts on the project? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.10.3 | Is the stakeholders engaged during project execution with clear communication lines? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.10.4 | Is the stakeholders their needs revalidated during the project life cycle, consider their needs, address them and changes required? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.10.5 | Totals | | | | | |
| 2.10.6 | Average | | | | | |

| | | | | | | |
|--|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 3.0 Technology Management Capability Area | | | | | | |
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 3.1 | Are there selected project management software tools that support the project manager in performing all project management functions including initiating, planning, executing, controlling and closing? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.2 | Are project management software tools Institutionalized? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 3.3 | Are project managers and associates trained and effectively using the tools? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.4 | Is there an integrated plan for the procurement and standardization of Project Management support tools such as Microsoft project, Primavera Team Play and ABT project Workbench? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.5 | Are tools and technologies used by management and project team members to enhance the collaboration and communication required to effectively manage the organization's projects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.6 | Are selected project management software tools compatible with existing software tools? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.7 | Are project management tools integrated with other corporate systems? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.8 | Are software tools used for the collection of data to advance benefits and ease of accessing historical information to improve the planning, execution and control processes across all projects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.9 | Totals | | | | | |
| 3.10 | Average | | | | | |

| 4.0 Decision Support Management Capability Area | | | | | | |
|--|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 4.1 | Are standard program/project communications distributed to all project stakeholders, in scheduled, required periods? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4.2 | Is timely information disseminated to facilitate effective go/no-go decisions for programs or projects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4.3 | Are deliverables assessed at defined gateway milestones to determine whether a project should continue or terminate? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4.4 | Are formal processes in place for performing variance analysis to evaluate project/programme status? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|-----|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 4.5 | Is there a formal process in place for developing, analyzing and evaluating different project scenarios during the decision making process? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4.6 | Is there a formal procedure to assess the level of information to be provided to different team members and project stakeholders? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4.7 | Are procedures refined and deployed for resolving and/or escalating inter- project or portfolio issues? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4.8 | Totals | | | | | |
| 4.9 | Average | | | | | |

| 5.0 Portfolio Resource Management Capability Area | | | | | | |
|--|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 5.1 | Are project initiation requests channelled through a single location where they are screened, evaluated, and periodically prioritized utilizing documented procedures? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.2 | Is there simultaneous monitoring and control over multiple projects or programs, and resources? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.3 | Are resources working on multiple projects? If so, is there a formal procedure to prioritize and reallocate resources among projects and or programs? Who has responsibility for the allocation process? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.4 | Are procedures deployed for assigning resources across all projects? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.5 | Are organizational efforts made to centralize project management across departments by coordinating procedures, resources assignments and communications? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.6 | Does the organization have a process to continuously review, assess and prioritize corporate initiatives and project portfolios? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.7 | Is there a formal process for selecting the projects to be executed? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 5.8 | Are inter-project processes and procedures defined to identify links between projects and/or tasks, ensure effective inter-project communication and to establish project priorities? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.9 | Do project and programme managers understand how their projects fit into the organization's overall goals and strategies? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.10 | Are the organization's executives directly involved in the organization's project management direction? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.11 | Does the organization have an internal project management organization that proactively supports project management practices? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.12 | Does the organization provide selection processes for Portfolio Management including Opportunity Screening, project Prioritization and Key Performance Indicators? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.13 | Are cost management processes defined for the established budgets to monitor project performance, continuously report project costs, risk criteria, forecasted pay-out, Net Present Value, Internal Rate of Return, break-even analysis, etc.? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.14 | Is there a programme for effective allocation of limited human, material and equipment resources defined and implemented for all projects and programs? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.15 | Totals | | | | | |
| 5.16 | Average | | | | | |

| 6.0 Professional Development Management Capability Area | | | | | | |
|--|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 6.1 | Do positions exist for various types of project management roles and responsibilities? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6.2 | Are Project Management performance and technical skills requirements defined and communicated to all project managers and associates? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|-----|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 6.3 | Is a project management professional career path programme deployed throughout the organization? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6.4 | Are designated project managers required to achieve specific, defined competencies, and/or internal certification? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6.5 | Are defined processes and procedures for training, mentoring, and developing professionals deployed throughout the organization? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6.6 | Are there regularly scheduled evaluations, and reward and recognition in place for team members? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6.7 | Totals | | | | | |
| 6.8 | Average | | | | | |

| 7.0 Continuous Process Improvement Management Capability Area | | | | | | |
|--|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Item | Question | 1 | 2 | 3 | 4 | 5 |
| 7.1 | Are quality guidelines and processes defined and a continuous improvement plan documented and enforced? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.2 | Do Document and Version Control processes exist to ensure current policies, procedures, tools and technologies are being applied? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.3 | Are periodic process audits performed to ensure that project management lessons learned and best practices are correctly utilized and integrated into the overall processes? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.4 | Are client satisfaction surveys conducted against measurable objectives used to improve scope definition and change management procedures? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.5 | Are Project Management standard processes and procedures periodically reviewed, enhanced or retired, to ensure reflection of current best practices? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.6 | Does the organization capture, analyze and incorporate lessons learned from past projects in its project management methodologies, tools and templates? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 7.7 | Is there formal evaluation of benefits realized from a project in comparison with original business objectives? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.8 | Is there a programme in place to achieve organizational project management maturity? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.9 | Totals | | | | | |
| 7.10 | Average | | | | | |

ANNEXURE B: PROJECT MANAGEMENT MATURITY MODEL

| Project Management Components | | Level 1: “Ad Hoc” | Level 2: “Planned” | Level 3: “Managed” | Level 4: “Integrated” | Level 5: “Sustained” |
|-------------------------------|------------------------|---|--|---|--|--|
| | Knowledge Management | No formal methods and procedures for collecting, storing, and sharing project related documents and information. | Methods and procedures to collect project documents in a central repository are defined. No formal gate keeping, review and acceptance of project related documents prior to publishing. | Documents are collected and stored in a central repository for high visibility projects. Formal gate keeping, review and acceptance of project related documents, is rolled out occasionally. | Documents are collected and stored in a Central repository for all projects. Formal gate keeping, review and acceptance of project related documents, is rolled out across all projects. | Historical project information is utilized across all projects to improve planning, execution and control processes. An advanced data search engine is put in place to ease the storing and collection of information. |
| | Integration Management | Basic project management procedures are defined and used for key projects. No formal project management procedures. | Formal project management are developed to support the existence of a small number of simple templates (typically < 50 tasks), applied occasionally. | Project management procedures are enhanced to support the maturation of all project management components applied inconsistently. | Project management procedures are improved to support the maturation of all project management components applied across all projects. | Formal contiguous improvement feedback loop exists. Lessons learned are integrated into the overall process. |

| | | | | | | |
|--|------------------|--|---|---|--|---|
| | Scope Management | No formal template parameters exist for defining project scope. | Simple scope management templates are Defined (introducing WBS), Stakeholder participation in requirements definition and Deliverable approval, and Change management processes are defined and Deployed rarely/occasionally. | Scope templates and change management procedures are enhanced to include formal acceptance and formal scope/change management, and measurable, quantifiable objectives are clearly defined with completion criteria applied inconsistently. | Formal scope/ change management is applied to all projects. Project performance is Measure against other projects. | satisfaction surveys are conducted against measurable objectives used to improve scope definition and change management procedures. Historical project performance metrics are used to continually improve performance standards. |
| | Time Management | No formal time Estimating techniques. Project plans are not statused for labor costs or schedule. Projects are not base-lined. | Estimating techniques for time are applied for some projects. Projects are statused for schedule, but not labor or cost, and are still not base- lined. | Actual (time) labor status introduced. Critical path is defined. Formal (time) base lining applied occasionally. Change control process for schedule revisions is applied. Labor is tracked only at the project summary level. | Historical schedules and labor actuals are utilized to improve Estimating Process (perform EVA). All projects are formally base lined to enable Effective measurement of variances. Labor is tracked at the WBS level of detail. | Historical variance data are utilized across all projects. |

Source: Project Assistants, Inc. (2005).

| Project Management Components | Level 1: “Ad Hoc” | Level 2: “Planned” | Level 3: “Managed” | Level 4: “Integrated” | Level 5: “Sustained” |
|-------------------------------|--|--|--|--|---|
| Cost Management | <p>No formal cost Estimating techniques.</p> <p>Project plans are not stasured for non-labor costs. Projects are not base-lined.</p> | <p>Estimating techniques for cost are applied.</p> <p>Projects are stasured for non-labor costs, and are still not base-lined.</p> | <p>Actual (cost) non-labor status introduced. Cost and labor double entries – as there is no integration into accounting systems.</p> <p>Formal (cost) baselining applied inconsistently.</p> <p>Change control process for budget revisions is applied.</p> <p>Costs are tracked only at the project summary level.</p> | <p>Historical schedules and non-labor actuals are utilized to Improve Estimating Process (perform EVA). All projects are formally base-lined to enable Effective measurement of variances. No double entries, as there is integration into project</p> | <p>Historical variance data are utilized across all projects.</p> |

| | | | | | |
|---------------------------|---|---|---|--|--|
| | | | | Accounting systems. Cost is tracked at the WBS level of detail. | |
| Communications Management | No formal communication plan exists – status /progress reports, meeting minutes, etc., and no project management forms exist. | Formal status and common forms exist. Summary status is not reported to Senior management. | Formal status and common forms are applied occasionally. Summary status is reported to senior management, but not all KPI's are reported to management. | Key performance indicators (KPI's) are reported to all levels of the Organisation across all projects. | Key performance indicators are used to manage the entire portfolio of projects, and to help the organisation make better decisions about which projects to initiate. |
| Risk Management | Risks are not identified. No contingency planning. | Risks are informally documented in text, not metrics, and | Risks are formally identified irregularly/inconsistently. Contingency plans are formally documented. | Risk identification, contingency planning and use of metrics to Measure | Historical quantitative risk scores are utilized to develop better |

| | | | | | |
|--------------------|--|---|---|--|--|
| | | <p>Risk identification is Not Regularly reviewed. When risks are realized, contingency plans are often not followed.</p> | <p>Metrics are captured for severity and odds of occurrence.</p> | <p>probability and impact are formally applied across all projects.</p> | <p>contingency plans.</p> |
| Quality Management | <p>No repeatable process defined to ensure quality deliverables.</p> | <p>Basic quality process requirements are defined, and stakeholder inspection and Approval sessions are introduced for Critical deliverables.</p> | <p>Inventory of documented processes are broadened, repeatable processes are applied, and stakeholder inspection and approval sessions are documented irregularly/inconsistently.</p> | <p>Process refinement and use to measure defects and gather basic quality metrics are applied across all projects.</p> | <p>Quality metrics are used to identify defects in the process, and used to improve the process.</p> |

Source: Project Assistants, Inc. (2005)

| Project Management Components | | Level 1: "Ad Hoc" | Level 2: "Planned" | Level 3: "Managed" | Level 4: "Integrated" | Level 5: "Sustained" |
|-------------------------------|---------------------------|--|---|---|---|---|
| | Human Resource Management | Project related staffing is decentralized and not documented. | Project assignments draw upon generic resource pools. Assignments are not people or skill set specific. | Resource planning using specific skill sets is identified Irregularly /inconsistently. Plans are optimized and 'leveled' by role. | Resource planning using specific skill sets is identified for all projects. Plans are optimized and 'leveled' by named resources. | Demand and capacity historical metrics are utilized to improve HR planning and forecasting. |
| | Procurement Management | Cost projections are not used to anticipate Procurement needs. Procurement | Basic project cost budgeting and forecasting for materials is performed, but there is no | Formal procurement process used for high visibility projects – RFP, vendor selection, and | Formal procurement process used across all projects – including vendor inspections. | Historical procurement metrics utilized to improve the procurement process for lead times and order |

| | | | | | |
|------------------|--|--|---|---|---|
| | process is inconsistent across projects. | formal procurement process. | managed contracts. | | aggregation for volume discounts. |
| Technologies | No formal software tools are in place for managing projects. | Simple project management tools and templates are defined using project management software tools. | Technologies are refined and advanced with formal training on the software applied irregularly or inconsistently. | Continued refinement of the tools and technologies with training and rollout across all projects. | Continued improvement of software tools and collection of data to advance benefits and ease of accessing historical information to improve the planning, execution and Control Processes across all projects. |
| Decision Support | No formal | Simple | Procedures to | Procedures to | Procedures are |

| | | | | | |
|--|---|---|--|--|--|
| | <p>management support or escalation procedures exist.</p> | <p>procedures to obtain, compile, distribute and Present accurate required information, and information forms and templates are defined and Deployed rarely or occasionally. Escalation procedures exist for senior management.</p> | <p>obtain, compile, distribute and present accurate required information, and information forms and templates are refined and deployed Irregularly or inconsistently. Summary status is reported to senior management.</p> | <p>obtain, compile, distribute and present accurate required information, and information forms and templates are enhanced and deployed across all projects. Summary status is reported across all levels of the organisation.</p> | <p>refined and deployed for resolving and/or escalating inter-project or portfolio issues.</p> |
|--|---|---|--|--|--|

Source: Project Assistants, Inc. (2005).

| Project Management Components | Level 1: “Ad Hoc” | Level 2: “Planned” | Level 3: “Managed” | Level 4: “Integrated” | Level 5: “Sustained” |
|--------------------------------------|--|---|---|--|---|
| Portfolio & Resource | No formal guidelines and procedures for assigning resources, managing inter-project dependencies, or monitoring a portfolio of projects exist. | Procedures are defined for Assigning resources. Skills are rarely or Occasionally defined across all disciplines. | Procedures are deployed for assigning resources irregularly/inconsistently. Skills identified and deployed across all disciplines occasionally. Projects can be summarized to pre-established, common phases or stages. Formal, measurable criteria (KPI’s) are defined for deciding if projects will be permitted to pass through these pre- | Procedures are deployed for assigning resources across all projects. Skills identified and deployed across all disciplines across all projects. Formal, measurable criteria (KPI’s) are defined for deciding if projects will be permitted to pass through “pre- | Procedures are refined and deployed for managing and monitoring inter-project, program or portfolio dependencies. |

| | | | | | |
|--------------------------|--|---|--|--|---|
| | | | defined “gates” to proceed to next stage (or phase) of the project. | defined gates” to proceed to next stage (or phase) of the project and these gating mechanisms are used to make real go/no-go decisions. | |
| Professional Development | The role of project management is not defined. No formal guidelines and procedures exist for professional development. | The role of project management is defined, and Professional development plans are identified. No formal career path/programs or reward and Recognition programs are in place. | Project management education, mentoring and training programs are deployed. Career path or programs and reward and recognition programs are defined. | Project management certification programme is defined and deployed. Career path/programs and reward and recognition programs are deployed. | Continued improvement of training, mentoring, skills, career programs, and reward and recognition programs. |

| | | | | | |
|--------------------------------|--|--|--|--|--|
| Continuous Process Improvement | No formal procedures exist for continuous process improvement. | Formal process Improvement procedures are introduced. | Procedures for validation of current standards, processes, methods and procedures against best practices are defined and deployed. | Procedures for verification and audits of effective application of all standards, processes, methods and procedures against best practices in the organisation are refined and deployed across all projects. | Effective successful standards, processes, methods and procedures are acknowledged and retained. Ineffective standards, processes, updated or retired. |
| Program Management | No formal guidelines and procedures for Managing programs | Procedures are defined for coordinating Activities across related projects. Existing processes are rarely/occasionally | Procedures for coordinating activities across projects are deployed and managed. Program information is collected. | Procedures for coordinating activities across projects are measure. Metrics are used to improve program | Program management procedures are refined and deployed for managing and monitoring inter-project |

| | | | | |
|--|----------|--|--------------|---------------|
| | applied. | | performance. | dependencies. |
|--|----------|--|--------------|---------------|

Source: Project Assistants, Inc. (2016).

ANNEXURE C: MATURITY LEVEL DESCRIPTIONS

| PMMM – Maturity Level Descriptions | |
|---|---|
| <p>Level 1 – “ad hoc”</p> <p>(No formal/standard processes applied)</p> | <p>No formal standards, process, methods, procedures or staff to constitute a project management discipline. Standard technologies and reporting are sporadic.</p> |
| <p>Level 2 – “Planned”</p> <p>(Formal/standard processes rarely or occasionally applied)</p> | <p>Project management standards, process, methods, procedures and staff exist in the organisation but are not considered to be an organisational standard. Basic documentation exists, inconsistent management support rarely/occasionally applied.</p> |
| <p>Level 3 – “Managed”</p> <p>(Formal/standard processes irregularly or inconsistently applied)</p> | <p>All project management standards, processes, methods, procedures and staff are in place as organisational standards. Formal documentation exists, consistent management support, execution irregularly/inconsistently applied.</p> |
| <p>Level 4 – “Integrated”</p> <p>(Formal/standard processes frequently applied and sporadically integrated throughout the organisation)</p> | <p>More refined project management standards, processes, methods, procedures and staff are in place. More refined documentation, consistent management support, consistent execution, and efficiency exist across all projects. Metrics are in place to collect performance data across all projects.</p> |
| <p>Level 5 – “Sustained”</p> <p>(Formal/standard processes consistently applied and integrated throughout the organisation)</p> | <p>Lessons learned and best practices are applied to continuously improve existing standards, processes, methods, procedures and staff. Metrics are collected and applied at the project, portfolio and organisational levels. The organisation is in a position to evaluate future decisions based on past performance and maximize its competitive advantage in the industry.</p> |

Source: Project Assistants, Inc. (2016).

ANNEXURE D: INFORMED CONSENT

Information sheet

Date:

Study Name: Assessing project maturity level in Botswana Railways

.

Researcher (s):.....

Graduate Programme in:.....

Purpose of the research

What you will be asked to do in the research

Risks and discomforts

Benefits of the research and benefits to you

Voluntary participation and freedom of withdrawal

Your participation in this study is completely voluntary and you may choose to stop participating at any time. Your decision not to volunteer will not influence the relationship you may have with the researcher or any benefactors of the research either now or in the future.

Confidentiality

Confidentiality will be provided to the fullest extent possible by law.

Questions about the research.

Research question were simple and understandable, easier to answer hence leading respondents to give reliable and valid information.

Legal rights and signatures:

I,....., consent to participate inconducted by
I have understood the nature of this project and wish to participate. I am not waiving any of my legal rights by signing this form. My signature below indicates my consent.

Participant:

Name of Participant Signature Date

Researcher:

Name of Researcher

Signature

Date

- * This form is to be administered and signed before a participant is involved in the research

Informed Consent Form

I, the undersigned, confirm that (please tick box as appropriate):

| | | |
|----|--|---|
| 1. | I have read and understood the information about the project, as provided in the Information Sheet dated _____. | <input type="checkbox"/> Y <input type="checkbox"/> N |
| 2. | I have been given the opportunity to ask questions about the project and my participation. | <input type="checkbox"/> Y <input type="checkbox"/> N |
| 3. | I voluntarily agree to participate in the project. | <input type="checkbox"/> Y <input type="checkbox"/> N |
| 4. | I understand I can withdraw at any time without giving reasons and that I will not be penalised for withdrawing nor will I be questioned on why I have withdrawn. | <input type="checkbox"/> Y <input type="checkbox"/> N |
| 5. | The procedures regarding confidentiality have been clearly explained (e.g. use of names, pseudonyms, anonymization of data, etc.) to me. | <input type="checkbox"/> Y <input type="checkbox"/> N |
| 6. | If applicable, separate terms of consent for interviews, audio, video or other forms of data collection have been explained and provided to me. | <input type="checkbox"/> Y <input type="checkbox"/> N |
| 7. | The use of the data in research, publications, sharing and archiving has been explained to me. | <input type="checkbox"/> Y <input type="checkbox"/> N |
| 8. | I understand that other researchers will have access to this data only if they agree to preserve the confidentiality of the data and if they agree to the terms I have specified in this form. | <input type="checkbox"/> Y <input type="checkbox"/> N |
| 9. | Select only one of the following: I would like my name used and understand what I have said or written as part of this study will be used in reports, publications and other research outputs so that anything I have contributed to this project can be recognised. | <input type="checkbox"/> Y <input type="checkbox"/> N |
| | I do not want my name used in this project. | <input type="checkbox"/> Y <input type="checkbox"/> N |

| | | |
|-----|--|---|
| | | |
| 10. | I, along with the Researcher, agree to sign and date this informed consent form. | <input type="checkbox"/> Y <input type="checkbox"/> N |

Participant:

Name of Participant Signature Date

Researcher:

Name of Researcher Signature Date

ANNEXURE E: RECRUITMENT MATERIAL

Date :

Name of Participant:.....

Address:

Re: Invitation to participate in a research on Project Management

Dear

My name is Thabo Gabanamotse who is studying for MBA at the Northwest University. I am writing to invite you to participate in my research study entitled “**Assessing project maturity level in Botswana Railways**”.

You are eligible to be in this study because you

.....

If you decide to participate in this study, you will be required to participate in one or more of the following activities:

Fill responses for a Questionnaire

Respondent to an Interview

The study is meant for the sake of academic advancement only and any information you provide will be treated with confidentiality.

Remember, this is completely voluntary. You can choose to be in the study or not. If you would like to participate or have any questions about the study, please email or contact me.

Thank you very much.

Sincerely,

T. Gabanamotse

tgmotse@gmail.com

Cell: +267 71 366 129