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APPLICATION OF PROJECT MANAGEMENT SOFTWARE AND ITS INFLUENCE ON PROJECT SUCCESS: A CASE OF NPOs IN THE WESTERN CAPE

by

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DECLARATION

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

Signed **Date**

ABSTRACT

Though strides have been taken to ensure the availability and application of technology, there still exists some disparity between the envisaged use compared to the actual one (Ross, Romich & Pena, 2016:48). The application of technology, such as project management software (PMS), could be the answer to unlocking success in projects especially where a large scope and high degree of complexity can sometimes prove to be very challenging.

The research explored how the application of PMS influences project success. A case of NPOs in the Western Cape Province, South Africa was used. The research objectives were to (1) establish if PMS is applied in the NPO's work, (2) determine employees' interactions with PMS relative to project success, and (3) identify the limitations of current PMS being used.

A non-experimental and quantitative approach was taken to conduct the research. Out of a potential 200 units of analysis, a sample group consisting of 132 project-implementing NPOs in the Western Cape was used. Ninety-four responses were received setting the response rate at 71%. The research instruments used were questionnaires, which were administered physically and online. The data was analysed using the Statistical Package for Social Sciences (SPSS) software.

There is high project success rate among NPO projects in the Western Cape at 77%. The research revealed that PMS is utilised in a significant number of organisations with the most popular ones used being Microsoft Project, Project Manager and Jira. Most project offices utilise PMS on a weekly or monthly basis especially during the project planning and execution stages. The limitations of the software include that it can over-complicate issues, be time-consuming, and costly. In light of the above, respondents revealed that they believe PMS does have a positive influence on project success.

Furthermore, based on the findings and conclusions derived from this study, the researcher made a few recommendations. For example, persons in academia need to widen the scope of the study to different geographical locations and use a different research approach. Another is that software engineers/developers must consider localised support for PMS as well as improve on scalability issues. To NPOs, recommendations were made on potential training sessions to capacitate the sector to be more adept to information and communication technology (ICT) and eventually make more use of PMS.

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DEDICATION

I would like to dedicate this to my parents, Mrs. S. S. Magwali and the late Mr. M. M. Magwali, for being the best tag-team and parents that I emulate, to this day. For modelling out wholesome living to us through energetically living out your passions as educators and community-builders, all the while still being the best parents to us. I love you.

I know greatness because I have stood on the shoulders of the giants you have been.

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GLOSSARY

PMS	Project management software (PMS) are information technology-based tools and systems that are designed to assist the project management team, as described by Braude & Bernstein (2016:52), “to meet the needs of customers and are reliable, efficient and maintainable.”
NPO	The Western Cape Government defines non-profit organisations (NPOs) as trusts, companies or other association of persons who are established for a public purpose, based on common interest to take action on a particular subject or issue (Government, 2009).
ICT	Information and communication technology

CHAPTER ONE
INTRODUCTION

1.1 Introduction

According to Miller, it is the goal of all organisations (business, civic society and government), to effectively plan, manage and deliver high quality outcomes, most often, as prescribed by the end-user (2016:15). The attainment of the aforementioned is often accepted as a good measure of project success.

Project success is often seen as relative and as Kuratko & Hodgetts (2001:6), describe, it is “a vital component for growing and successful organisations”. Organisations with project environments should therefore fully engage and support the development and implementation of projects to enable their success and ultimately feed into the development and growth of organisations.

One proven enabler to successful projects as stated by Hall & O'Dwyer, is the employment of stable and repeatable systems and processes (2017:82). One such system that has grown in importance over the last decade and that is key to the success of a project is the management of information and communication technology (ICT). The importance of ICT in the delivery of outcomes cannot be over-emphasised and it is important that it is fully supported and operational in order for the overall system to work well.

An example of an ICT system that is used in the project management circles is project management software (PMS). PMS can be generic or specific, and is usually designed with project lifecycles in mind and is supposed to enable the most efficient planning, control and management of projects (Braude & Bernstein, 2016:261).

For the purposes of this particular study, the researcher elected to study a case of PMS application in Non-Profit Organisations (NPOs) in the Western Cape. Over the last few years, there has been a growing demand for the improvement of infrastructure and service delivery not only in the Western Cape but in South Africa as a whole (Steyn, 2016:26). Though this is the primary responsibility of government, most NPOs have a mandate to assist in the development and welfare of selected areas. This is a mammoth responsibility which often requires integrating with other structures, for example other NPOs and the respective communities in which they serve, in order for their mandate to be delivered.

The role of NPOs is further necessitated in cases where the government has budgetary constraints as is with the case in South Africa (Ahmad, 2011:15). Most NPOs receive their funding from various sources including corporates, high net-worth individuals, international

agencies, other governments and federations amongst others; with whom they have stringent agreements on the use of funds for successful projects (Holtzhausen, 2013:255).

It is because of these conditions that most NPOs are taking strides to employ more project-based approaches when tackling their work. This approach has yielded many successes for example in the projects like that of the building of new wings at the Red Cross Children's Hospital (Children's Hospital Trust, 2016). Though these successes are applauded, there remains room for improvement on how projects can be more effectively and efficiently executed.

Currently, it is unclear if NPOs make use of systems like PMS in the execution and management of their projects. The aim of this study was therefore to explore the application of PMS and its influence on project success using a case of local NPOs in the Western Cape.

1.2 Research Problem

As Patanakul (2014:52) alludes in his study of projects in the public domain of a few developed countries, "public sector projects are challenging due to the involvement of many stakeholders and the need to manage various relationships". As various scholars would attest, success in managing projects requires a great deal of coordination and collaboration. The advancement in technology has brought about several systems (for example, PMS) and tools (for example, Gantt charts) that are developed to assist project teams in their work. This could be through the management of human resources, time and work-flow so that ultimately project success is attained (Dayani & Gelbard, 2015).

Though numerous strides have been taken to ensure the availability and application of technology, there still exists some disparity between the envisaged use and the actual use (Ross, Romich & Pena, 2016:48). This disparity is concerning especially in light of the advancement of end-user centric technology. Santos (2015: 22) advocates that the application of such technology could be the key to unlocking success in projects especially where a large scope and high degree of complexity can prove to be very challenging.

1.3 Significance of the Study

This study will be of significance to the following parties:

Software Developers and Engineers

The outcomes of this research will be useful to software developers and engineers as it would inform them of what it is that end-users expect from PMS (for example, in terms of functionality and usability). Seeing that some of the software employed locally is designed and managed

overseas, this study will assist in giving the developers and engineers a point of reference regarding the South African context and more particularly, the Western Cape context.

NPOs

In the challenging economic, social and political environment in South Africa, NPOs are on the lookout for how to better to do their work (Wiggill, 2014:278-285). This study will contribute to the improvement of their existing practices. With the aforementioned constraints that most project management offices have to manage of time, resources and scope, there always exists a need of how to work seamlessly together in the attainment of set objectives. Also, because of the stringent agreements with the donors on the use of funds and the execution of projects within agreed timelines, NPOs need to ensure that existing resources (including technologies) are optimally utilised towards the realisation of set objectives. This research will assist them to identify technologies that can make them execute their work better, reach their objectives and improve their rate of project success.

Fellow Researchers

This study is also going to benefit fellow researchers who would be interested to take the study by widening the geographical scope or specialising in other specific project management software.

1.4 Objectives of the Study

Main Objective

Determine the uptake of PMS and establish its influence on project success.

Sub-Objectives

1. Establish if PMS is applied in the NPO's work.
2. Determine employees' interactions with PMS relative to project success.
3. Identify the limitations of current PMS being used.

Research Questions

1. Which project management software are used within the NPOs?
2. What are employees' perceptions of the current software in use?
3. What is the relationship between the use of the software and the success of the projects?
4. What are the shortcomings of the current software?

1.5 Key Concepts

Project

According to the Project Management Body of Knowledge (PMBOK) Guide, a project is any series of tasks and activities that have a specific objective to be completed within certain specifications, have defined start and end dates, have resource limitations, and cut across several functional lines (Duncan, 2013:4). Examples of projects include developing a new product or service.

Project Management

Schwalbe (2016:9) describes project management as the application of knowledge, skills, tools and techniques to project activities to meet project requirements. It is further added that the entire process needs to meet the needs and expectations of people involved in the project activities or affected by them.

PMS

These are information technology-based tools and systems that are designed to assist the project management team, as described by Braude & Bernstein, “to meet the needs of customers and are reliable, efficient and maintainable (2016: 52). In addition, these tools assist the project team to meet project schedules and budgets”.

Project Success

Often refers to the completion of a project within the allocated measurable such as time and cost, at the proper performance level with minimum scope changes and with the outcomes accepted and usable by the customer/user (Kerzner, 2013:5).

NPO

The Western Cape Government defines NPOs as trusts, companies or other associations of persons who are established for a public purpose, based on common interest to take action on a particular subject or issue (Government, 2009). The key defining characteristics for NPOs is that they operate independently, not-for-profit and not for self-serving aims and values.

1.6 Research Design and Methodology

The main objective of this study was to ascertain the application of PMS and whether this application has an influence on the success of the projects where the software is applied. The study focussed on NPOs in the Western Cape Province, South Africa. For this study, the researcher elected to adopt a positivist paradigm which allows for formalised, controlled, and precisely defined results (Roos, 2005:4).

The researcher used the non-experimental research design approach (Thompson & Panacek, 2007). With this approach, the researcher utilised the quantitative study method. This approach as defined by Cant, Gerber-Nel, Nel & Kotze, generates statistics by using methods such as questionnaires or structured interviews (2005:46).

Flowing from this, the researcher used standardised questionnaires as the data collection instrument. This type of questionnaire was relevant for this study because as Sauro & Lewis (2012:49), impute, standardised questionnaires assess participants' perception regarding the usability of products or systems.

The questionnaires included closed and open-ended questions. The questions were derived and informed by the research questions and the research objectives aforementioned. Secondary sources of data in the form of existing research quoted in the literature review were also used to inform the research questions.

To ascertain the credibility of the questionnaires as a suitable instrument for collecting data, the researcher consulted academic and professional peers who had undertaken studies in project management and particularly PMS. The researcher also piloted the questionnaire among 4 people from the research population but outside the sample population. After encapsulating all the feedback, the researcher then took the questionnaires to the field for completion.

Out of a possible 200 units of analysis, a sample size of 132 NPOs was determined. The researcher employed a mixed methodology of random convenience as well as the snowballing sampling methods in selecting the respondents. Secondary sources of data were used to identify the relevant NPOs in the Western Cape which apply project management in their work. Following this, the respective NPOs were approached with a request to conduct the study.

1.7 Ethical Considerations

The researcher sought permission to collect data from the relevant authorities at the selected NPOs under study. Secondly, the issue of consent was addressed in that all respondents were informed that their participation was voluntary.

1.8 Findings and analysis

Following receipt of the completed questionnaires, the researcher proceeded to capture the data. As the researcher had elected to use the quantitative approach in collecting the data, the Statistical Package for the Social Sciences program was utilised to code and analyse the data.

Where relevant, the findings were analysed in relation to the research objectives and questions, and reference was made to the findings and work of other researchers whose findings were reviewed previously in the literature review chapter. Some of the findings included the below.

The average age of years that the NPOs have been in operation is 12 years. Education and health projects are the most popular projects being implemented. Availability of funding and the alignment to organisational values are the main criteria used to select projects. Proper planning/ organising is viewed as the most important stage to focus on as it highly influences project success.

Acceptability by end-user and completion on budget are the most common identifiers of project success. The main challenges to project success are insufficient resources and inadequately defined requirements. The most commonly used PMS are Microsoft Project, Jira and Project Manager. Most users employ PMS on a weekly or monthly basis.

PMS is not without its limitations which include the over-complicating of issues and sometimes being time-consuming to employ. It was the researcher's opinion that the above limitations could also be due to the fact that there is limited training and refresher training offered to employees on PMS.

The main reason some were not keen on employing PMS in their work was that the scope of their work was too small to guarantee usage and employing the PMS could be time-consuming. The functionalities that were suggested in order to increase the uptake of PMS include that it should be modifiable to suit organisational needs, more simple to use, have less jargon and foster more connectedness and coordination.

1.9 Limitations of the Research

The researcher elected to conduct the study amongst local NPOs in the Western Cape. This geographical limitation left out other NPOs outside the province who may also be facing the same challenges. Their scenarios could have brought a different angle to the research; which unfortunately was not captured in this study.

1.10 Outline of the Dissertation

Chapter 1: Introduction

The chapter gave the context of the study. In it were sections which included briefs of the research problem, significance of the study, literature review, research methodology and limitations of the research.

Chapter 2: Literature Review

This chapter will look at various sources of information, mostly academic, to see what has been done in the researcher's field of study.

Chapter 3: Research Methodology

This chapter will speak to how the researcher will collect the data for the study. It will include details of the research design and methodology, the tools that will be used to collect the data, the sampling methods, the ethical considerations and the research constraints.

Chapter 4: Findings and Analysis

This chapter will include the recording, interpretation and analysis of the data received during the data collection phase. This chapter will summarise the results of the study as a whole and include a discussion of the respective results.

Chapter 5: Conclusion and Recommendations

Based on the findings of the study, this chapter will conclude and give recommendations to selected parties of interest on existing possibilities and the scope that exists for further development or research.

1.11 Conclusion

Included in this chapter was a background to the research problem. This included looking at the strides that have been made in ICT thus far particularly in the NPO sector. The researcher also highlighted examples of PMS and their importance.

Also included in the chapter was an overview of existing literature pertaining to the subject matter. This contributed handsomely to the building of the research objectives and sub-objectives which are shown in the chapter. Furthermore, an introduction was made to the research design, methodology and process employed in this research. Also available is the outline of the dissertation which gives a snapshot of how this research is structured.

In the next chapter, the researcher will delve deeper into the available literature around the subject matter.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

Included in this chapter is a review of available literature which is relevant to the topic of project management software particularly among NPOs in the Western Cape. Firstly, definitions and discussions will be provided of the key concepts where essential. There will be an in-depth discussion of the literature pertaining to the advent and growth of ICT particularly PMS in project management environments. The literature will be reviewed under the following headings: project management, PMS and NPOs in the Western Cape.

The principal thrust will be confined to concerns which pertain to the research topic. A wide range of relevant primary and secondary literature sources were consulted for example existing and reliable databases, textbooks, articles in leading academic journals and annual conference proceedings in disciplines such as Project Management.

2.2 What is a Project?

According to the PMBOK Guide, a project is any series of tasks and activities that have a specific objective, that are to be completed within certain specifications, have defined start and end dates, have resource limitations and cut across several functional lines (Duncan, 2013:126). Examples of projects include the development of a new product or service or the improvement thereof.

The above definition is widely re-enforced by other scholars such as Young (2013:89) who hones in on the definition by emphasising the element that it is a “temporary endeavour to achieve specific objectives in a defined time”. This particularly speaks to the issue of time and objectives. It is to be noted from both definitions that time is a scarce resource in projects and more specifically that projects should run for a certain (often temporary period) and not permanently. Also, as both scholars allude, clearly defined objectives should be present before the commencement of a project.

Another facet for consideration is that projects should result in the development of a new or improved product or service. Berman (2007:35), alludes to this by stating in his definition of projects as “that which looks at providing a unique product/service”. This also speaks to the definitions given by the PMBOK and Young that clear objectives should be defined from the onset. This means clear articulation of what the end-result will be i.e. product or service.

Ahonen et al. (2015:208) re-enforce another facet of projects; which is their size and how they cut across several functional lines. They state that some projects are small and managed across several function lines internally in organisations, while others are big enough to involve

multiple organisations and include different project sites. The differences in size of the projects have a bearing on their requirements and how they are managed.

To note from the PMBOK definition is the stating that the resources dedicated for projects are usually limited. Silvius et al. (2011:220-245) speak to this facet by stating that projects are "unique efforts that require the mobilisation and optimisation of resources from different disciplines, capabilities and organisational units in order to achieve organisational success".

From their definition, it is understood that sometimes budgets for projects are "mobilised"; for example, from across several function lines in the organisation. With such resources, it is even more imperative that they are optimised and effectively utilised as they are accounted for in the various function lines.

From Silvius and other's definitions, there is also mention that projects are ultimately intended to bring about "organisational success" (2011: 220-245). This facet is also discussed by Wald, Schneider, Spanuth & Schoper (2015:24), who found in their study that, "the share of work-time of a firm spent in projects correlates positively with the innovation success of a firm, and the innovation success correlates positively with the business success of a firm. However, the share of work-time does *not* correlate significantly with the business success".

From this discovery there are two things the researcher would like to elaborate on to show the importance of projects. Firstly, that projects are important because their existence or employment in organisations does contribute to the realisation of innovation and business success. Secondly, as evidenced in the above study, organisations that merely go with the '*modus-operandi'* and do not employ projects to continuously innovate, do lag in terms of business success.

Flowing from the above definitions, it is evident that though projects are important to organisations, their execution is still not easy as they would be set in highly constrained environments; for example, with limited resources and setting across various function lines. Haselberger (2016:1-17) speaks to this by articulating that in their nature, projects carry more risk and uncertainty and are therefore prone to failure owing to simple things, such as lack of co-ordination flowing from various sources.

Even with the above being the case, due to the importance and contribution to value addition in an organisation, it is pivotal to find ways in which projects can be implemented and managed in organisations. Yang (2016:674) emphasises the importance of effective and repeatable systems, and processes that promote the efficiency and effectiveness of projects. Over the past few decades there has been a rise in various systems and processes that can be employed to manage projects and ensure that the objectives are attained.

2.3 Project Management

As alluded to in the section above, the role of projects in an organisation is evolving, and now more than ever, projects are the keys that effect innovation and business success in their respective organisations. With this being the case, the need for effective and efficient management of projects for the attainment of set objectives has become even more important.

Project management has become such a pivotal addition to how organisations do their business such that Silvius et al. (2011: 220-245) state that it is expected that in the future, good project management practices will yield the following benefits for organisations which implement them:

- It will be a critical competence of any organisation.
- Since it takes cognisance of the triple-bottom constraints from the onset, it will lead to the yielding of better financial outcomes.
- Due to the increasing profile, sophistication of software applications, maturity of professional associations and rising academic interest in project management, it is likely that project management will also grow into an isolated professional field.

The notion of it being a critical competence in organisations is supported by Young (2013:14), who defines project management as a “dynamic process that utilises the appropriate resources of the organisation in a controlled and structured manner to achieve clearly defined objectives identified as strategic needs”. He further explains that this is accomplished through the integration of the project management phases of initiating, planning, executing, monitoring, controlling and closing. What is included in these phases is briefly stated below:

Phases of Project Management

Figure 2.1: The project life cycle

(Adapted from Esposito, 2015)

Schwalbe adds on an interesting additional aspect of the use of tools and techniques in project management (2016:9). Tools and techniques can also be labelled as resources of an organisation and they must be optimally used in the relevant processes of project management needs to meet the needs and expectations of people involved in the project activities or affected by them. Tools and techniques are also referred to in Silvius et al.'s (2011: 220-245) definition where they speak of the increasing profile and sophistication of PMS.

From the above, it can be observed that this competence is focussed on optimally using the existing organisation's resources in a manner that achieves set objectives which are also the strategic need of that very organisation. These elements are re-enforced by other scholars, such as Schwalbe, who describe project management as the "application of knowledge, skills, tools and techniques to project activities to meet project requirements", (2016:9).

Dr. Kerzner's 16 points to project maturity bring about an interesting angle to project management as there is emphasis on the use of a consistent project management methodology (Kerzner, 2013:5). This is particularly important as projects usually occur in cross-cultural climates (for example, departments/units/organisations). Consistency in management methodology would therefore be useful in harnessing active involvement from the various climates. From the above literature, it can be observed that projects present numerous opportunities and challenges, which if managed well can yield great successes for a business.

2.4 Project Performance

The way a project performs can be attributed to various factors. One such factor is the presence of incentives. Incentives can be monetary or non-monetary and project-related or otherwise. The issue of incentives is alluded to by Xianhai and Gallagher from a study in construction projects which they undertook in the United Kingdom and Ireland. One of the highlights from that study was confirmation that incentives do play an important role in achieving excellent project performance (Xianhai & Gallagher, 2012).

They also, however, noted that the success of such incentives required internal and external efforts (Xianhai & Gallagher, 2012). A good example stated is that the use of those incentives would need to align the contractors' objectives to the client's expectations while ensuring that project management processes, collaborative working environments and motivation of staff is enhanced.

A study by Suprapto, Bakker, Mooi & Hertogh (2015:318-327) brings an interesting perspective of two measures that also contribute to better performance outcomes in addition to the incentivisation; namely, better relational attributes and teamwork quality. These are sometimes overlooked due to the focus that would be on getting the technical or core aspects of the project.

To ascertain performance, there are various measures which are used depending on the type and complexity of the project. The most popular measures include how the project performs measured against its constrained elements; for example time/schedule, resources, and quality (Duncan, 2013:4). Another common measure in certain spheres is the issue of stakeholder acceptance. These stakeholders can be clients, suppliers, or customers in the community where the project output is to be delivered.

What stands constant is that project performance depends on the "perspective taken to judge it" (Koops et al., 2015:42). This especially rings true as different outputs vary in their importance to different types of projects. For example, in construction, the most important outcome may be the quality of the erected structure whereas in the service sector what is most important is how the stakeholders accept the output. In light of the above, the most common criteria used to ascertain performance is discussed below.

2.5 Key Performance Criteria in Projects

According to the research conducted by Todorović, Petrović, Mihic, Obradović & Bushuyev, (2015:775), "project success analysis, presented through the definition of critical success factors, key performance indicators and performance-measuring process has a very positive influence on knowledge acquisition and transfer in project environment". With this in the light,

project teams are then able to give focus to ensure that the aspect with the most 'weighted' effect then gets the most attention.

As highlighted previously by Duncan (2013:4), the most common indicators of project performance are quality, cost and time; while stakeholder acceptance has also lately been accepted as a criterion as well.

Quality

Quality came under the spotlight with Castillo-Villar, Smith & Simonton, (2012:5925) in their study who realised that quality or the cost thereof has "more strategic and economic value than had been previously conceived" . From this statement, it shows that quality is not achieved overnight but is rather also a costly component of project management that should be factored in from the project initiation and planning phases.

Its attainment is said to have strategic and economic value which could possibly emanate from repeat business from clients who are satisfied with the quality of work produced. Further to this, Castillo-Villar et al. (2012: 5926), in the same study, produced a model that can be used to design "a logistic route that achieves a minimum total cost while maintaining an overall quality level while also able to evaluate the impact of investment on quality to increase overall profits".

In a study by Geraldi, Kutsch & Turner, (2011:562), they highlight that though quality has been extensively studied in repetitive operations, it remains under-researched in projects. They proceed to state that the uncertainty and dynamics of projects challenge the principles of quality developed for repetitive operations, and call for project-tailored solutions. This communicates that there is no "one-size fits all" principle when discussing quality. Various factors in the project have to be taken into context in order to be able to distinguish project performance. In repetitive operations, it is usually easier to determine the attainment of quality as there are principles and standards such as International Standards of Operation (ISO).

As stated above, quality can be seen as subjective yet it still remains an important indicator of project performance, especially taking into consideration that it can be viewed from various angles and by different stakeholders. This is particularly true and is supported by Basu (2014) who, in a study, highlighted the importance of implementing the people-related 'organisation quality' amongst key stakeholders to deliver the success criteria of a project. This means that quality would not be a 'once-off' isolated event; rather, it would be organisation-wide and engraved into how organisations do projects/business. In addition, in their study, they developed the Assessing Process Excellence (APEX) tool to assess the key constructs of project quality and excellence.

As stated above, quality as an end-product is usually not an isolated event. As also discussed by Orm & Jeunet (2018:321) in their study, activities' quality and aggregation methods are used to derive the overall project quality'. This confirms and substantiates the above findings from Basu's study that to achieve 'organisation-quality', it is crucial that all the activities tied to the project are also of a high standard.

Time/ Schedule

As prescribed by a study undertaken by Martens & Vanhoucke, the timely completion of a project is one of its main factors for success (2017:103). This is because most stakeholders adhere to the adage, 'time is money', and indeed no stakeholder wants money to be wasted.

This stance is supported by Dumic, Sisejkovic, Coric & Jakobovic, (2018:42), who in their study state that the main task of scheduling is the allocation of limited resources to activities over time periods to optimise one or several criteria. Furthermore, they add the aspect that scheduling algorithms are devised mainly by the experts in the appropriate fields and evaluated over synthetic benchmarks or real-life problem instances . This substantiates the notion that by managing to stick to timelines and complete projects on time, this is thought to have a positive impact on the overall cost of the project as well.

From their study, Martens & Vanhoucke, give various ways to assist project managers to manage timelines in order to realise success in their projects (2017:103). These include that during the scheduling phase, a project buffer can be installed to protect the project deadline. While during the execution phase, tolerance limits that generate warning signals when the project deadline is endangered should be constructed to monitor the buffer consumption. Both these options help in maintaining the project schedule so that the project if finished on time.

In a related study, An, Qiang, Wen, Jiang & Xia, (2018:402-412), set out to empirically figure out the impact of project managers' participation on project ending, and their capability's contribution to project ending performance under pressure. This purpose could have been brought about due to the fact that the management of timelines and performance in most cases lies with the project manager. From their findings, they discovered that project managers tend to first lose control of tasks with less strategic importance under pressure. When placed under pressure it is therefore expected that tasks that are not essential may be lost in favour of those that are crucial to the production of relevant outcomes of the project.

In order to manage the above process effectively, as Nagata, Manginelli, Lowe & Trauner, (2018:50) in their study state, 'it is best that the project schedule is best prepared by those who are going to execute the work". Part of preparing this schedule is with the aim to accurately identify the critical path. It therefore, also follows that the critical path method (CPM) schedule

is most effective when it properly models the project plan thereby ensuring that the project outcomes are reached in a more effective manner.

Resource/Budget

Resources are another facet of the tripartite of the "iron-triangle", and are probably constrained in most projects. It is for this reason that various researchers have looked into how resources can be optimised for project success. For example, Hurink, Kok, Paulus & Schutten, (2011:315), in their study developed a decomposition method for the Time-Constrained Project Scheduling Problem (TCPSP) with adjacent resources. The model ties in two constrained variables of time and resources with scheduling, so that better project outcomes are attained.

Another strategy that has been used to buffer the effects of cost is resource-levelling which as Atan & Eren (2018:64) noted, "is important in project management as resource fluctuations are costly and undesired". This is further explained by Markou, Koulinas & Vavatsikos, (2017:164) in their study, who state that, “peaks and valleys in the resource usage histogram are responsible for cost overruns due to the necessary recruitment, dismissal and training of the personnel”. Therefore, the goal with resource levelling in most cases is so that supply is balanced out with demand. This balance is often tricky and the most common cause for delays in the completion of the project.

To aid in navigating the tricky supply and demand logistics, Tabrizi (2018:58) suggests that, concurrent planning of project scheduling and material procurement may be made to enable the facilitation of more efficient execution of projects. Though this sounds like a noble plan in hindsight there is always an issue regarding the efficient management of available resources.

Stakeholder Acceptance

As alluded to by Williams (2015:1840), though quality, time and cost remain the most popular criteria for measuring project success, customer satisfaction and other client relationship attitudes have emerged as additional criteria in recent years. This is particularly because stakeholder relations have a huge impact on future associations and business.

According to a study by Davis (2014) on perceptions of project success factors between three groups of stakeholders, it was found that for some groups, there were no common success factors. This lack of agreement in a set of factors shows the subjective nature of what success or failure is to different stakeholders. This is mostly due to the fact that stakeholders’ viewpoints are defined by their interests.

A case in point is for projects where there is a civic side. A study by Llopis-Albert, Palacios-Marques & Soto-Acosta, (2015:1644) on integrated water resource management, presented a case study with future scenarios that could potentially lead to different environmental impacts

and socio-economic development of the region. From the case study, though the project was beneficial for the present moment, there were different degrees of acceptance between stakeholders.

Though cases are far between where there is synonymous acceptance by all stakeholders involved, there are chances of increasing the acceptance levels in the respective groups. One such way is explained in a study by Huijgens, Deursen, & Solingen, (2017:26), where they concluded that, "a focus on shortening overall project duration, and improving communication and team collaboration on intermediate progress is likely to have a positive impact on stakeholder satisfaction and perceived value"**.**

In light of the above factors, then comes the issue of defining and deciding the performance of a project, that is, whether it has succeeded or failed.

2.5.1 Project Success

According to Miller (2016:15), it is the goal of all project managers to effectively plan, manage and deliver high quality outcomes, most often, as prescribed by the customer. The attainment of the aforementioned is often seen as a good measure of project success. Project success is very important for organisations as it has a direct link in the long-run to the innovation and business success of the very same entity (Wald et al., 2015:24).

Kerzner (2013:5) describes project success as the completion of a project within the allocated measurables, such as time, quality and cost, at the proper performance level with minimum scope changes and with the outcomes accepted and usable by the customer/user.

This description by Kerzner is widely supported by other scholars, such as Atkinson (1999:43), who states that cost, time and quality have become inextricably linked with measuring the success of project management. The three factors are also often referred to as the 'triple bottom line' and have over the past years presented the core basis on how to measure project performance.

Serrador (2013:28-39) zones in particularly on that project success is defined by the quality of work produced. This element of the triple bottom line is particularly relevant because it relates both to the constrained variables that would have been used and the viewpoint of the customer or end-user that would ultimately make use of the product or service.

Cooke-Davies (2002:18-190) brings about a different dimension to project success in that it has a lot to do with how projects deliver the benefits required by business strategies in order to meet wider business objectives and to create value. This shows that projects in themselves are also instruments used by organisations in order to achieve their goals and therefore must

also at the same time make monetary sense. This ties back as well to the notion on the ultimate contribution of projects to innovation and business success (Wald et al., 2015:25).

The issue of projects contributing to value creation is also highlighted by Coopers (2007:52) who states that the contribution of project success to business success cannot be understated because projects in an organisational portfolio can address different objectives to support the execution of overall business strategies. Therefore, projects can also be seen as a tool through which other organisational objectives are achieved. These objectives may include increasing the profit margins or extending the product or service lines.

Kuratko & Hodgetts (2001:6) are also in agreement with the issue of value addition that comes with having successful projects as they describe project success as, “a vital component for growing and successful organisations”. Projects are therefore portrayed once again as instruments that can assist in the attainment of growth in an organisation. A common notion is that nothing ever grows from doing the same thing over and over again. Instead, going outside a particular ‘comfort-zone’ is what actually brings about growth; for example, in this case in the form of projects that occur in a contained environment of limited time and resources.

2.5.2 Project Failure

On the other side of the spectrum of project performance lies failure. MacMahon (2001:45) describes the main reason behind failure as the inability to take timely and effective action to resolve the underlying causes of the root problems. In the project environment, root problems vary in nature and can range from project teams not fully understanding the scope of the project, to leadership struggles within the team. This is especially the case with projects that are highly constrained with respect to factors such as time, resources and capacity, where even a slight mistake can have massive repercussions.

This stance is further supported by Lehtinen & Mäntylä (2014) who in their study found prevention of failure particularly in software projects requires “case-specific analysis and controlling causes outside the process area where the failure surfaces”. This therefore means that there should be collaboration between the individuals and managers responsible for different process areas in order for the entire output to be successful. According to Sage, Dainty & Brookes (2014:548), in project management, "failure is often assumed to be evidence of deficient management; a problem that can be overcome by better management".

In a study by Long-Chen (2015:238), the findings suggest that "performance changes in the execution phase explain an important part of project outcomes and more importantly, are useful predictors for project failure".

2.5.3 Potential Solution

One proven enabler to successful projects as described by Hall & O'Dwyer (2017:82) is the employment of stable and repeatable systems and processes. One such system that has grown in importance over the last decade is Project Management Software. It gives value to projects through assisting in the management of resources, time and work-flow (Dayani & Gelbard, 2015) which are crucial for project performance.

2.6 Project Management Software

The following section will include literature on project management software including but not limited to its importance, characteristics, limitations, controversies and what criteria people usually consider when purchasing it.

2.6.1 Importance of Information and Communication Technology

The United Nations Development Program (UNDP) defines ICT as “information handling tools that include goods, applications, and services, and are used to produce, store, process, distribute and exchange information” (Reddi, 2011:85). This definition gives various facets of ICT and what it can do. It is observed that as a tool, it heavily relies on information and more particularly quality information in order for it to be effective from the inputting to the outputting stages.

It should be noted that ICT manifests itself in various forms (tangible and non-tangible) including goods, services and application. These are the ones which are used to execute the broad spectrum of tasks highlighted above which are from the production to the distribution of information.

Rouse (2005) sees ICT as an umbrella term that includes any communication device or application encompassing radio, phones, network hardware and software, satellite systems as well as the various services and applications associated with them. This definition re-enforces that ICT is an information-fuelled tool that manifests in tangible and otherwise ways.

The examples reflected in the definition, for example, phones and hardware, shed light on the dynamics of ICT; that it is constantly evolving. This is mostly evidenced by the numerous iterations and developments looking back at the last ten years only as a start. Where phones were once operated at a fixed place, we now have mobile phones where one can access and use them virtually anywhere. The first hard drive developed in 1956 had a capacity of five megabytes (5MB) and said to have been the size of two refrigerators and used fifty 25-inch platters (Farrance, 2006). Nowadays, we have hard drives to the size of one-hundred gigabytes (100GB) being available in a size equivalent to an adult’s fingernail.

ICT has revolutionised the way in which most industries and trade operate. In fact, The World Bank has shown that a 10% increase in broadband penetration results in a 1.38% increase in the Gross Domestic Product (GDP) of a country (Government, 2016). GDP refers to “the total value of all goods and services produced within the borders of a country during a specific period of time, usually a year or a quarter (Jordaan, 2013). This statistic shows that connectivity and information sharing through ICT plays a significant role in the development of a country. It stands to reason therefore why we see developed countries being more technologically advanced than their less developed counterparts.

The contribution of ICT to the development of a country is supported by Palvia, Baqir & Nemati (2018:170) who state, “ICT has the potential to affect many aspects of economic and societal activities such as GDP growth, employment, productivity, poverty alleviation, quality of life, education, and healthcare”.

This above notion is especially true considering the rapid growth of most developed economies that have widely employed ICT in the way that they do business and run their respective economies. On the other hand, relevant low growth is still seen in lesser developed economies where broadband and other related internet facilities are still relatively inaccessible. The ripple effect of this is seen in many markers of the development of an economy such as quality of life and education mentioned above.

Oksana (2016:3) writes, “in the 21st century, ICT plays a major role in knowledge generation, information retrieval, extraction and processing especially under constantly increasing and changing requirements imposed by ongoing technological progress”. Through this, we see ICT reiterated as an information-intensive and dynamic lever which is constantly progressing.

Through this progress in ICT, we now have systems and tools such as PMS and Gantt charts that are meant to assist in making projects and ultimately the work of organisations easier, effective and more efficient. This is alluded to by Braude & Bernstein (2016:52), who add that the ICT-based systems and tools are designed to assist project teams, “to meet the needs of customers and should be reliable, efficient and maintainable”.

For the purposes of this study, the researcher will delve deeper into PMS.

2.6.2 Characteristics of Project Management Software

PMS can be described as “software used for project planning, scheduling, resource allocation and change management” (Young, 2013:89). Through this definition we see that PMS can play a bilateral role of assisting with the project stages while ensuring the success criteria is met. For example, in this case, project managers and other stakeholders can use a PMS to control costs and manage budgeting while simultaneously planning the project and its implementation. In such cases, the PMS can then also serve as a focal administration system.

The above definition is supported by Mavenlink (2016), who describes PMS as the software that has various features that help managers control their costs and hit deadlines. Again, we see a bilateral function of timely “project stage” planning while also ensuring that success enablers are kept in check. This is supported by Duffy (2018:110), who states that some PMS include tools for managing resources as well, whether those resources are workers, materials, or money. These, could take the form of generating reports that give managers insight into how to distribute work to project team members or tracking time spent on projects and integrating it with invoicing and billing systems.

PMS can also be identified by the various characteristics or forms that it takes. One such characteristic is that PMS can be web-based and/or desktop-based (Buser, Massis, & Pollack, 2014: 29). Web-based PMS is accessed via technology that is linked to internet connectivity and usually includes the involvement of web-based applications (apps). On the other hand, desktop-based PMS does not necessarily require the internet. It can run on the organisation’s internal systems with other existing programs.

Duffy (2018:110) states that PMS provides, “real-time workspaces and lets team members and outside partners keep an eye on every detail that brings a project to fruition”. This is important in project management as it can be viewed as a real-time monitoring and evaluation tool. In the NPO environment where the funds are usually from donors, there is often emphasis and pressure to report to them timely. Giving donors access to their particular funded projects can boost their confidence as they will be able to see the progress being made in real-time. This can be provided by software through “an overview of the projects in the pipeline, as well as the nitty-gritty details about the daily work being done to move the projects forward”.

Another interesting characteristic is that PMS can be bought off-the-shelf or can be tailor-made to industry or project specificity. Off-the-shelf PMS is usually standardised while the tailor-made versions can be made to suit particular projects or stakeholder’s requirements. In both cases, however, it is still pivotal that the PMS is readily available to the project manager for the processes of planning, scheduling, levelling, monitoring and reporting. At its very best, PMS could assist project teams at the various project phases to track slipped deadlines, and automatically rescheduling tasks that are affected by them.

The issue of the project phases is also raised by Jha (2011:25), who mentions that the advantages of using software in a project management environment includes improvement in speed and accuracy and usability in all stages of the life cycle of the project. An example is at the planning stage; PMS helps create well thought out plans with creative solutions based on the logical sequencing of events. Another example is during the execution/implementation of the project, PMS is helpful in promoting effective coordination and better resource allocation.

Kostalova, Tetrevova & Svedik (2015:102), in their study state that “an important function offered by a project management information system is the possibility of sharing data concerning the running projects across the project team and their surroundings”. The integration of PMS to effectively share information is important to any project environment and as they go on to state, “it should be considered how available technologies support the project management methods and makes it possible to get support in the various stages of the project life cycle”.

It should be noted that technology aided support for making decisions in projects has long been a tradition. As (Gemunden, Lehner & Kock, 2018:148) allude, “tools like CPM developed in the 1950s helped to plan and schedule complex projects more efficiently and contributed much to the diffusion of project management tools and practices”. These were initially usually drawn up or plotted on hard surfaces which would take up plenteous space.

Due to technological advancements in ICT we now find that these can now be plotted and tracked virtually, thereby presenting a host of other advantages. Over the years, there has been an increase in such agile methodologies to aid in project management. Lei, Ganjeizadeh, Jayachandran & Ozcan (2017:62), add that these methodologies are effective because of their “incremental and iterative” aspect.

2.6.3 Project Management Software - Limitations and Controversies

With all the characteristics and advantages noted above, it should be noted however that PMS is not without its limitations or controversies. According to Jha (2011:27), these include the fact that the advantages of the software are not remarkably visible for small projects as compared to the big projects. Hence sometimes, small organisations or organisations that handle small projects are not enthusiastic about embracing the technology as they would not be seeing the direct benefit of using it.

Another common notion is that such systems as PMS and web applications are innovations that can be disruptive to the workflow. In a study by Keller & Husig (2009), particularly based on web applications, it was identified that while such innovations show a potential to satisfy market demand in established performance attributes, strong network effects in existing software products should give incumbents enough time to co-opt the innovation.

This is also alluded to by Wysoki (2006:58) who suggests that project teams should be involved from the start in the selection of the software to be used. This is to avoid the most common pitfall that assumes that project members are adept at fully utilising whatever software is solicited by top management. This gives ample time as well to co-opt the new technology. Milosevic, Patanakul & Srivannaboon (2010:69) further suggest investing in user training prior

to the integration of the software in the organisation. They go as far as stating that this integration should not only be for the project teams but for the organisation as a whole.

Dr. Kerzner also suggests in his “16 Points to Maturity” theorem that systems and tools, such as PMS, should be used for the purposes they were designed and not as “a substitute for effective planning or interpersonal skills” (Kerzner, 2013:5). For a project to be successful there is the need for the harmonious interaction of the soft skills as well as the hard ones. In this case, technology should not alienate the required ‘people skills’ because after all, it is the people who operate the technology and not the other way around.

Niazi et al. in their study found that in most cases, software development teams are located in different parts of the world; most times different from where the end-users are located (2016). This presents the challenge that there a may be a lack of local context for project management activities and challenges. Also, there may be as challenges jargon used may differ from place to place.

Though numerous strides have been taken to ensure the availability and application of technology, there still exists some disparity in the envisaged use compared to the actual use (Ross, Romich & Pena, 2016:48). This disparity is concerning especially in light of the advancement of end-user centric technology. Santos (2015:22) advocates that the application of such technology could be the key to unlocking success in projects especially where a large scope and high degree of complexity can prove to be very challenging.

2.6.4 Project Management Software - Selection Criteria

Over the last decade, we have seen a rise in the number of applications, programmes and software that provide project management solutions. Examples particularly of PMS in the market include Microsoft Project, Primavera, Trello, Compuware and Changepoint (Binder, 2007:42). Though there is unlikely to be one perfect solution for everything, there are always options for solutions that fit a specific organisation or project better. As stated by Johansson (2017:310), below are some of the factors usually considered in the due diligence process of selecting a PMS.

Ease of on-boarding/ use

PMS is supposed to make project tasks and execution easier. One should therefore be able to load, use and integrate the software with other existing systems and tools that are in place.

Scalability

Seeing as most business and technological landscapes are dynamic with potential to change in size or scope amongst other factors, there is therefore, a need for software that is scalable.

User support

It is common with most software, regardless of how perfect they are, that users experience problems with them; for example, there may be the presence of bugs and certain upgrades that are not compatible with other systems. In such scenarios it becomes imperative that there be responsive and strong user support.

Cost

Due to the cost of some of the software, it is essential to look at it in the context of return on investment (ROI) especially in relation to the equal cost or impact it would have had on the organisation or project budget. With such cases, it is also imperative that the software be not underutilised, especially if it would have cost the organisation a substantial amount of money.

2.6.5 PMS in the Market

In this section, the researcher will look at the various types of PMS that one can purchase off the shelf or otherwise for use in an organisation.

Microsoft Project

Microsoft Project is arguably one of the most common software in the market, mostly because it is associated with Microsoft (a very popular and reputable organisation). Examples of organisations that have or still use this software are Amazon, Tesla, Hugo Boss, Shell, Blue Cross and Blue Shield. Some of the characteristics of Microsoft Project as stated by (Microsoft Corporation, 2013) include:

- Team members can communicate, update task status and share documents from any device. Projects can also be saved in the cloud to allow for ease of access across devices and seamless collaboration within teams.
- The software allows the submission of timesheets to capture project and non-project time spent for payroll, invoicing, and other business purposes.
- Team members can track and monitor project health including everything from burn-down charts to financials.
- Team members can plan projects using familiar scheduling tools like Gantt charts.

Trello

Trello is also widely popular and is known for its flexibility as a productivity platform. As Atlassian Corporation (2013) state, “whether it’s for work, a side project or even a family vacation, Trello helps your team stay organized”. Some of the organisations that use Trello

are British Red Cross and National Geographic. In the following, Pash (2011) states how Trello works:

- A team member creates a project (called boards), add lists to it, and add list items (called cards) to those lists.
- To collaborate, the team member invites people to join the board.
- Once they join, members can add and edit items and lists thereby making it possible to keep track of who is working on what.

As Pash (2011) alludes, “the whole site's very user friendly, and that combined with the depth of functionality makes it a strong solution for people looking for anything ranging from simple list-making to full-on team management and project collaboration”.

Asana

According to Hardy (2013), Asana is known to help companies become organised by dividing work into tasks carried out by different teams. It works on the premise of linking the functions of e-mail, with data repositories (for example, where things like marketing campaigns are created, worked on and stored). Some of the characteristics of Asana include that:

- It enables management capabilities like being able to view multiple tasks.
- It enables access controls over who can see and work on something.
- It allows for automated sign-up of new project team members.

Examples of organisations using this software are Airbnb, NASA and USAID.

Jira

According to Atlassian (2013), Jira works in the following way:

- It allows for the creation of user stories and issues, planning of sprints and distribution of tasks across the project team. This enables project teams to discuss their work in full context and with complete visibility.
- It allows project teams to add estimates to the user stories and track progress over time to aid in the project accuracy.
- It allows for project teams to have access to more than a dozen out-of-the-box reports with real-time.
- There are actionable insights into how teams are performing sprint over sprint.

Zoho

Zoho is particularly known for assisting in the planning of projects. Zoho Corporation (n.d.), states the following main characteristics of the particular software:

- It enables the creation of milestones and task-lists that assist in organising complex projects into easily manageable units.
- It enables the creation of Gantt charts which then provide a detailed visual on the schedule and progress of your tasks.
- It allows project teams to log issues and track them as they get fixed and tested.
- It allows project team members to have access to the latest version of all project documents. This is very important for project teams as they then can work together on documents, presentations, and spreadsheets in virtual time.

Smartsheet

According to Smartsheet Inc. (n.d.), Smartsheet software is designed to unleash the benefits of greater work agility and collaboration by providing a powerful platform for organisations to plan, capture, manage, automate, and report on work. The software, therefore, empowers teams to execute projects with speed and accountability and thereby making better decisions faster. As Perez (2014:121) goes on to explain, the following are the advantages of Smartsheet:

- It enables the management and elevation of customer experiences.
- It enables the alignment and execution of processes for better, faster, and lower-cost of on-boarding.
- It relieves operational headaches and delivers bottom-line results by accelerating projects.
- It simplifies budgeting and planning processes.
- It supports fiscal success by simplifying the management of strategic investments.

Easyprojects

According to Logic Software (2012), EasyProject is based on “Work Breakdown Structure (WBS), Gantt, Agile methods, Earned Value and other best Project Management practices”. Organisations that are currently using this technology include Ogilvy, Lenovo and Bosch.

Some of its advantages include that:

- It is user-friendly and an effective capacity planning solution.
- It provides functionality common to software designed for Project Collaboration, such as configurable Dashboards, Integrated Reporting and Message boards.
- It allows for issue and request tracking, statistics, email notifications and Gantt charts formulation.

ProWorkFlow

ProWorkFlow provides a project dashboard that can be seen by assigned project teams, clients and contractors. It includes tasks, time, messages, files, quotes and invoices. The following are additional characteristics of ProWorkFlow according to Proactive Software (n.d) :

- It allows for time tracked on tasks to be pulled directly into invoices. This also adds a dimension of depth to the workflow management.
- It allows for the option of standardised reports where detailed information on workload and performance as well as projects, tasks, time and financial data are provided.
- There is also an option for customised reports that allow for the building of specific reports, through selecting filters and data that are needed.

2.7 Non-Profit Organisations

For the purposes of this particular study, the researcher has elected to do a case study of NPOs in the Western Cape. The Western Cape Government, (2009) defines NPOs as trusts, companies or other association of persons who are established for a public purpose, based on common interest to take action on a particular subject or issue.

This definition is similar to Coppola's (2015:522-587) who adds that these are organisations "independent of government and whose primary mission is not commercial but focuses on social, cultural, environmental and other issues. The key defining characteristics for NPOs is that they operate independently, not for profit and not for self-serving aims and values.

The Business in Society handbook, (2017:21) states that NPOs, also referred to as NGOs, as encapsulating a broad range of interests that contribute to the social fabric of South Africa. In addition, the NPO Act, which regulates standards of accountability, transparency and governance for NPOs, defines such organisations as taking the form of a trust, company or other association of persons that is established for a public purpose and does not operate at a profit.

Some of the main characteristics of NPOs include their dominance of social motives, values and goals over financial ones, a diversity of stakeholders, and an action-oriented rather than an administrative culture (Hall & O'Dwyer, 2017:84). With reference to this and the above, the importance of NPOs in the South African development sector is undisputed.

As alluded to by Wiggill (2014:278-285), this rings particularly true after the economic recession that negatively affected government's delivery of infrastructure and services. Despite the important role they play, NPOs still experience great difficulties; for example, in obtaining sustained funding for their work. This has a ripple effect on their operations.

Over the last few years, there has been a growing demand for the improvement of infrastructure and service delivery not only in the Western Cape but in South Africa as a whole (Steyn, 2016). Though this is the primary responsibility of government, NPOs have an equal mandate to assist in the development and welfare of the areas in which they are located (The Trialogue, 2017:87). This is a mammoth responsibility which often requires integrating with other structures for example other NPOs and the respective communities in which they serve, in order for their mandate to be delivered.

The role of NPOs is further necessitated in cases where the government has budgetary constraints as is with the case in South Africa (Parliament of the Republic of South Africa, 2018). Most NPOs receive their funding from various sources including corporates, high net-worth individuals and international agencies amongst others; with whom they have stringent agreements on the use of funds (Holtzhausen, 2013). The Trialogue's (2017:87) annual corporate social investment research that looks at how NPOs are accessing and using their funding last year confirmed the below pattern of sources of income for most NPOs in South Africa.

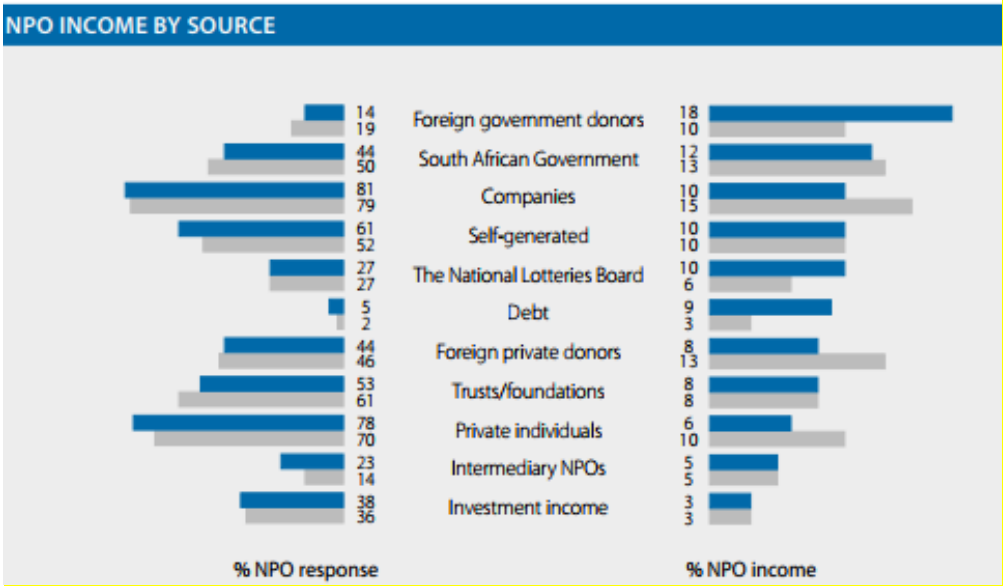

Figure 2.2: NPO income by source

(Adapted from The Trialogue Handbook, 2017: 87)

The challenging economic, social and political environment in South Africa, also necessitates that NPOs are on the lookout for how to better to do their work (Wiggill, 2014: 278-285). Because of the stringent agreements with the donors on the use of funds and the execution of projects within agreed timelines, NPOs need to ensure that existing resources (including technologies) are optimally utilised towards the realisation of set objectives. This research will assist them to identify technologies that can make them execute their work better and help them reach their objectives.

This approach has yielded many successes; for example, in the projects like that of building new wings at the Red Cross Children's Hospital (Children's Hospital Trust, 2016). Though these successes are applauded, there remains room for improvement on how projects can be more effectively and efficiently executed.

With that being the case, there is an ever-growing need for NPOs to renovate and almost reinvent themselves and the way that they operate in order to be fully capable to address the various social problems that South Africa faces. Through this, NPOs are also able to demonstrate to the parties that fund them that they can be trusted, are committed to make a difference and that they deliver on their promises (Holtzhausen, 2013).

One way of renovating and re-inventing one's self is through changing the way that they operate and conduct their affairs. The advent and development of ICT) has revolutionised the way companies conduct business; for example, a number of processes can now be streamlined (Landau et al., 2014). The availability of data that can be updated daily makes improvement of business processes more rapid.

It is this type of thinking that is also crucial to take the work of NPOs forward as most of their work is conducted in project form, that is with finite resources and a stringent time-frame and most often with a donor who would be strictly monitoring that outcomes are delivered on time (Hall & O'Dwyer, 2017:82). To please the donor so that they invest in future projects as well as to attract new donors, the question often arises of how then NPOs can optimise their performance in order to make that happen.

As alluded to by Niebel (2018:197-211), one way of strengthening capacity in modern organisations is to optimise the use of ICT. One proponent of ICT that can be employed in this case is PMS. It is for this reason that the researcher aims to see if selected NPOs are already applying PMS and if so, whether it has been useful to them in achieving their objectives.

2.8 Non-Profit Organisations' - Projects in the Western Cape

As Patanakul (2014:52) alludes in his study of projects in the public domain of a few developed countries, "public sector projects are challenging due to the involvement of many stakeholders and the need to manage various relationships". This stands true for NPO projects as well which are mostly implemented with the public as the end-user. Often times, NPOs "value their independence and neutrality, tend to be decentralised and are highly practise-oriented". Through this, it is evident that the nature of work that NPOs engage in is mostly project/practise based and a great deal of coordination, and collaboration is required.

The benefits to organisations adopting a "project-oriented" approach in their work can be best described by (Gemunden, et al., 2018) who describe project-oriented organisations as "entrepreneurial, future- and stakeholder-oriented innovating organisations, which use projects as temporary, task-focused organisations, to define, develop, and implement its strategies, to transform its structure, culture and behaviour, and to define and develop new products, services, and business models.

The above is supported by Spalek (2014:844) who states that project management success is closely linked to the success of an entire organisation in both a strategic and operational view, thus increasing the importance of project management adoption in organisations. The entrepreneurial aspect is further alluded to by Turner, Ledwith & Kelly (2009:946), who outline the vital importance of entrepreneurship.

NPOs have been at the forefront of the implementation of remarkable projects whether through infrastructure development or health intervention amongst others. Though these projects have realised great milestones, there is still capacity for more to be done. One such way this can be possible is to embrace tools that foster the success of the projects of this nature. One such tool is PMS and this study will explore how using this tool can influence project success.

Though there have been ample studies on the application of software in the spheres of the corporates, there remains a gap in the study of the same principle to NPO environments. This is similar to a case in point presented by Latif & Williams (2017), who realised a significant lack of research on NPO projects in their case with respect to team effectiveness. It is also for this reason, that the study has been designed so that it may shed more light into the world of NPOs.

The Children's Hospital Trust is one of the remarkable NPOs based in the Western Cape and which has been at the helm of many a remarkable project. One of those projects being the upgrading of the Operating Theatre Complex at the Red Cross War Memorial Hospital. The Trust raised R125 000 000 towards this initiative and was also involved in the project management of this whole initiative (The Children's Hospital Trust, 2016).

Another notable project it has been part of is that of the paediatric ward at Victoria Hospital. Almost R100 000 000 was raised towards this project by the Children's Hospital Trust. The project took part in phases to allow patient units to remain in operation prior to the completion of the project.

Another notable NPO is Breadline Africa which spearheaded a library project as well as the development of early childhood centres for lower quintile school areas (Breadline, 2009). Its infrastructural investments amongst others have seen it achieve part of its mission which is to "help children to do better in school by ensuring that they have safer spaces to learn in" (Breadline, 2009).

Ikamva Labantu is an example of another organisation that is playing quite a pivotal role as an NPO. It has various projects that it runs in the development space as it supports community relations, families and health (Ikamvalabantu, 2012).

CapaCiTi is also another NPO which looks at entrepreneur development and skills development. Through the various programmes run under these brackets, CapaCiTi contributes significantly to the economic development of many people in the Western Cape.

2.9 Conclusion

This chapter has reviewed various sources for literature which is relevant to the research topic, through delving deeper into the key concepts of project management, PMS and the NPO landscape in the Western Cape. The following chapter will be devoted to a comprehensive discussion of the research design and methodology which were employed to design and collect the data for the purposes of this study.

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

The previous chapter included a review and analysis of existing literature regarding the subject area and various proponents related to it. This chapter focuses on the design and methodology, utilised to inform the collection of data for the study and to enable the researcher to come up with a conclusion to the research study. Included amongst others, are details of the methods used to collect the data, the sampling methods, the ethical considerations, and the research limitations.

The field work was conducted during the period of May to August 2018. A plethora of research methodologies could have been used to conduct research studies in a field; such as that of project management, including surveys and interviews in the case of a quantitative study or case studies in the instances of a qualitative approach.

However, for reasons that will be detailed later in the chapter, the researcher elected to follow the quantitative approach for this non-experimental study. The study also followed a mix of a causal and predictive research design. In terms of collecting the data, the researcher used standardised questionnaires which were semi-structured. These were distributed to the selected sample of the relevant population. Out of a research population of 200, the researcher's sample size was 132.

The researcher carried due diligence in assuring the participants, that amongst other things, participation in the study was voluntary and that all data and information collected would be treated with confidentiality and for academic purposes. Consequently, the chapter will include details of how the fieldwork was conducted and how the issues of bias, reliability and validity of data were addressed. Lastly, the chapter will disclose how the data was coded using the SPSS software and analysed.

3.2 The Research Process

Burgess (2001:1) looks at the basic research process as comprising of seven essential steps. These steps are depicted in the diagram below and will be discussed in finer detail throughout the course of this chapter. In addition to the respective research process followed, the researcher will also discuss amongst others, issues of ethical consideration, bias and reliability, limitations of the research as well as the coding and analysis of the data.

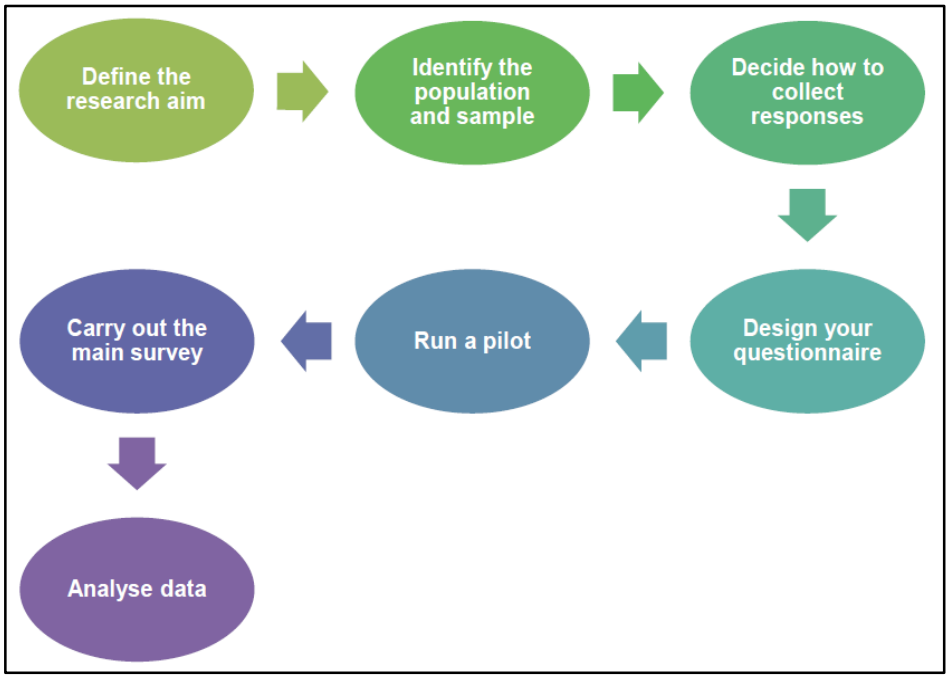

Figure 3.1: The research process

(Adapted from Burgess, 2001:1)

3.3 Research Design

According to Kirshenblatt-Gimblett (2006:45), “the function of a research design is to ensure that the evidence obtained enables you to effectively address the research problem as unambiguously as possible”. Therefore, the design phase of research can be compared to that of a house in that it allows the researcher to envision the end-result; and then pulls the reigns for one to see what is required for the end-result to be attained. In the case of this study, the design enabled the researcher to logically set out the path for data collection and analysis.

Furthermore, the research design is “the overall plan for connecting the conceptual research problems to the pertinent (and achievable) empirical research”. Transforming problems and ideas into quantifiable or empirical formulations is not an easy feat. The design process in this case is therefore, shown to be the link that enables the crossing over of the two facets.

Burns & Grove (2003:195) proceed to state that the design process affects “the validity of the findings” and therefore the conclusion as well. It can therefore be said that not attending to the design process can be risky as the conclusions drawn can be prone to being seen as weak or not adequately addressing the research problem or questions.

Flowing from the above notions, it is evident that research design is therefore of vital importance as it determines the success or failure of a research. For the purposes of this study, the researcher elected to follow a mix of a causal and predictive design.

3.3.1 Causal and Predictive Design

According to the University of Southern California Libraries (2016), causality studies may be thought of as “understanding a phenomenon in terms of conditional statements in the form, “If X, then Y.” The explanation goes on to state that this type of research is used to measure what impact a specific change will have on existing norms and assumptions. It is very similar to predictive studies where the questions asked are “what will the effect of x be on y?”

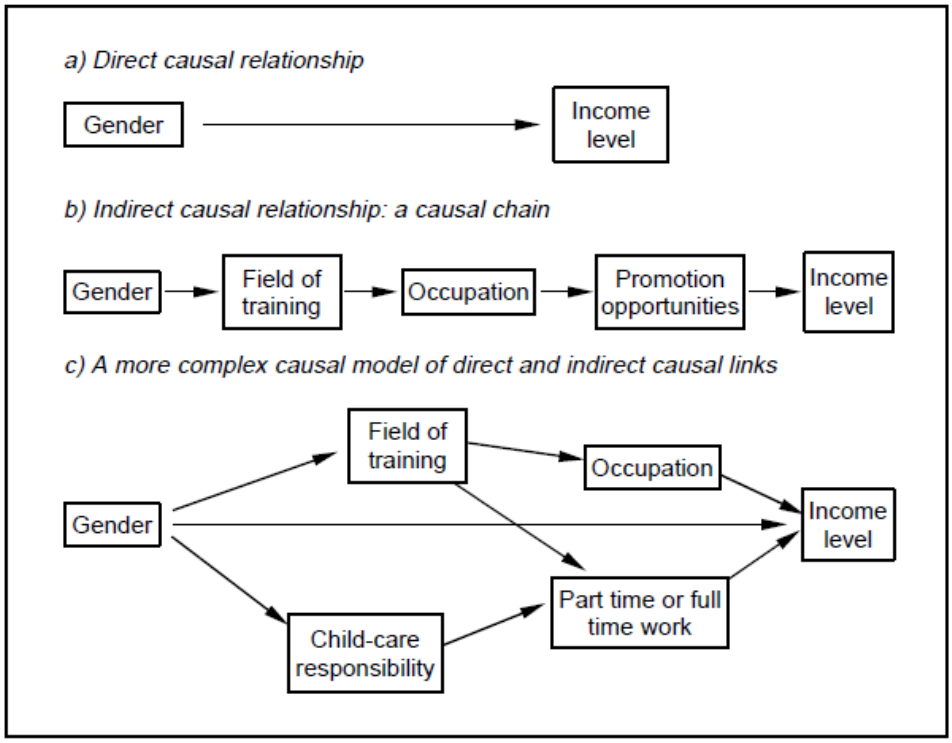

Figure 3.2: Examples of three types of causal relationships

(Adapted from University of Southern California Libraries, 2016)

As seen above, causal relationships can have various layers up to four or five. The researcher elected a mixed design of causal and predictive research as it aligned with the subject of the study; which lay somewhere in the centre of the two respective archetypes. The study looked at the application of PMS and thereafter, its influence on project success.

The study fit these designs because it satisfied some of the conditions listed by Bachman & Schutt (2007:225) as being necessary for determining causality and predictiveness:

- **Empirical association**

  From this study a valid conclusion based on finding an association between the variables was derived.

- **Appropriate time order**

  From this study, the application of project management was investigated first and thereafter, subsequent causation to project success was looked into.

- **Replication is possible**

  The researcher aimed to create confidence that the study has internal validity by employing systematic methodology processes in collecting the data as well as analysing it.

With this design it should also be noted, however, as Bachman & Schutt (2007:263), allude that “not all relationships are causal or can be predicted. Also, conclusions about causal relationships are difficult to determine due to a variety of extraneous and confounding variables that exist in an environment”. This is true in project environments especially as there are various other factors that contribute to project success and it is not merely one; for example, in this case, there are other factors besides PMS that determine whether a project succeeds or not.

3.3.2 Research Paradigm

A paradigm is a shared world view that represents the beliefs and values in a discipline and that guides how problems are solved (Schwandt, 2001:190). Particular paradigms may be associated with certain methodologies. As Chilisa & Kawulich (2012) allude, a positivistic paradigm typically assumes a quantitative methodology, while a constructivist or interpretative paradigm typically utilises a qualitative methodology.

The main objective of this study was to ascertain the application of PMS and whether this application has an influence on the success of the projects. For this study, the researcher elected to adopt a positivist paradigm which is aligned to the quantitative approach and allows for objectivity and the rationalisation of concepts in measurable terms.

The positivist approach was selected because it also provided for “formalised, controlled, and precisely defined results” (Gustafsson, Johnson & Roos, 2005:214). In addition, this paradigm was selected because Chilisa & Kawulich (2012) state that it is logical and holds that scientific methods are the best way to establish truth and objective reality.

3.3.3 Research Background and Problem

As Patanakul (2014:52) alludes in his study of projects in the public domain of a few developed countries, "public sector projects are challenging due to the involvement of many stakeholders and the need to manage various relationships”. As various scholars would attest, success in managing projects requires a great deal of coordination and collaboration.

The advancement in technology has brought about several systems (for example, PMS) and tools (for example, Gantt charts) that are developed to assist project teams in their work. This could be through the management of human resources, time and workflow so that ultimately project success is attained (Dayani & Gelbard, 2015:74-76).

Though numerous strides have been taken to ensure the availability and application of technology, there still exists some disparity in the envisaged use compared to the actual use (Ross, Romich & Pena, 2016:48). This disparity is concerning especially considering the advancement of end-user centric technology. Santos (2015:22) advocates that the application of such technology could be the key to unlocking success in projects especially where a large scope and high degree of complexity can prove to be very challenging.

Over the last few years, there has been a growing demand for the improvement of infrastructure and service delivery not only in the Cape Town area but in South Africa as a whole (Steyn, 2016). Though this is the primary responsibility of government, NPOs have an equal mandate to assist in the development and welfare of the areas in which they are located. The role of NPOs is further necessitated in cases where the government has budgetary constraints as is with the case in South Africa.

Most NPOs receive their funding from various sources including corporates, high net-worth individuals, international agencies, other governments and federations amongst others with whom they have stringent agreements on the use of funds for successful projects (Holtzhausen, 2013:287-293).

Currently, it is unclear if NPOs make use of systems like PMS in the execution and management of their projects. Therefore, this study aims to determine the uptake of PMS in NPOs in Cape Town and establish its influence on project success.

3.3.4 Objectives of the Study

Main objective

Determine the uptake of PMS and establish its influence on project success.

Sub-Objectives

1. Establish if PMS is applied in the NPO's work.
2. Determine employees' interactions with PMS relative to project success.
3. Identify the limitations of current PMS being used.

Research Questions

1. Which PMS are used within the NPOs?
2. What are employees' perceptions of the current software in use?
3. What is the relationship between the use of the software and the success of the projects?
4. What are the shortcomings of the current software?

3.4 Research Methodology

Lewis, Thornhill & Saunders (2012:56) refer to research methodology as the theory and analysis of undertaking a research. On the same wavelength, Schwandt (2001:195) describes research methodology as the theory of how an inquiry should progress, involving analysis of assumptions, principles and procedures in an approach of inquiry. Research methodology is therefore important as it is that which brings the process of collecting data to life.

Though scientific, this study will be non-experimental in nature. In light of this, the most common types of research approaches are qualitative and quantitative or a hybrid of the two. The most common approaches followed are quantitative, qualitative and participatory or action research Schwandt (2001:197). For the purposes of this study, the researcher elected to use the quantitative approach.

The researcher employed this approach because it allows for the gathered quantifiable data, to be analysed statistically to produce quantified and objective results (Garbarino & Holland, 2009:13). This approach was a good fit also because as stated by Cant, Gerber-Nel, Nel & Kotze, 2003:76), it allowed for the generation of statistics using survey research by using methods such as questionnaires or structured interviews.

The researcher elected to use standardised questionnaires as the data collection instrument.

3.5 Research Location

The study focussed on NPOs in the Western Cape Province. The Western Cape is one of South Africa's nine provinces and is divided into five districts, namely: Cape Town, Cape Winelands, Overberg, West Coast, Eden and Central Karoo. As mentioned earlier, the study will only focus on Cape Town - see Figure 3.3 below.

Figure 3.3: Western Cape Map

(Adapted from Western Cape Government Website: 2017)

3.5.1 Research Population

A population can be defined as what or who the researcher makes use of in order to obtain the necessary information to complete the study and as Haralambos & Holborn (2008:815) explain it, the term population refers to a group of individuals that share characteristics, for example, citizens of a country or cars of the same brand.

The research population for this study consisted of NPOs that employ project management in their work and that operate in the Western Cape. NPOs take various forms; for example, trusts or non-profit companies and as any other sector, they vary in terms of aspects like size, vision, core purposes and methods of operation (Department of Social Development, 2011).

In South Africa all NPOs are registered with the Department of Social Development. The researcher utilised the existing database available at the provincial department (Western Cape Government, 2011). The researcher further used secondary research to distinguish between the offerings of the NPOs; that is, whether they are services-based or project-based.

Seeing as this database had last been updated in 2016, the researcher supplemented the database with a list from Sangonet also known as NGOPulse; a reputable and premium organisation that specialises in providing support services to the NPO sector in South Africa (Sangonet, 2016).

From this consolidation, the researcher came to 200 possible units of analysis. This was based on NPOs in the Western Cape that are 'project-implementing' at the time of study.

3.5.2 Sample Size

For academic purposes, it is said that a small sample drawn from a target population will reflect the characteristics of the group from which it has been drawn (Garbarino & Holland, 2009:13). The notion follows, however, that the bigger the size of the sample, the higher the level of exactitude to reflect the target population. Needless to say, the lower the size of the sample, the lower the precision and reflection of the actual population.

As advocated for by The Survey System (2006), the factors that inform the perfect sample size vary, and include looking at the triple constraints of time, cost and quality (which in this case is quoted as the degree of precision required). Taking into account the above and in order to have the study show the highest level of exactitude, the researcher also consulted the CPUT's statistician to work out the most appropriate sample size.

Together with the statistician, the researcher utilised Sekaran's (2000:295) "prevalence sample size table" to determine the best sample size. The table's values come from a statistical equation shown below:

$$n = \frac{Z^2 p.q.N}{e^2(N-1) + Z^2 p.q}$$

Equation 3.1: Prevalence sample size

(Adapted from Sekaran, 2000: 295)

Where

n is the required sample
N is the population size
p and q are the populations - ***since these were not finite, they were set to 0.5.***
Z is the value that specifies the levels of confidence wanted for the confidence interval when data is analysed. ***To attain a normal confidence level of 95%, z was set to 1.96.***
E sets the accuracy of the accuracy of the sample proportions. **The accuracy of in this case was tagged at 5%. E was then set to 0.05.**

Using the above two methods, a sample size of 132 NPOs was determined for this quantitative study. The sample size is acceptable as advocated by Sekaran & Bougie (2010:296) who state that a significant value of a sample must be from 30 to 500 depending on the type of population used.

3.5.3 Sampling Techniques

When it comes to selecting a sample for academic research, there are 2 options of probability and non-probability sampling techniques (Latham, 2007:2). Probability sampling entails selecting a portion of the research population in a manner in which each element or member of the population has an equal likelihood of being selected (Polonsky & Waller, 2011:140). Examples of methodologies that fall under this technique are stratified and systematic sampling. Latham (2007:2) expresses that the advantages of this technique include that they give “everyone an equal chance of being selected, whilst eliminating selection biases”.

In striking contrast, non-probability sampling involves researchers using their personal judgement to select participants who best embody the characteristics in which they are interested (Polonsky & Waller, 2011:140). Examples of methodologies that fall under this technique are quota and convenience sampling. Latham expresses that the main advantage of this technique is the convenience it offers. It is because of this reason and furthermore that an existing database with the contacts of the research population was available; that the researcher elected to employ the non-probability techniques in this study.

3.5.4 Sampling Strategy

For the purposes of this study, the researcher employed a mixed methodology of random convenience as well as the snowballing sampling methods. The convenience sampling method is based on the notion of using the most accessible sample available to a researcher. This method is advantageous in that it is less time consuming and usually there is less financial expenditure required to execute it (Welman, Kruger & Mitchell, 2005:162). The random convenience method was employed when the researcher used her findings from secondary research to e-mail 132 NPOs that she had listed from the Department of Social Development as well as Sangonet’s databases. Some respondents agreed to participate in the survey, while some had reservations to be addressed and some declined participation. Ultimately, those that had agreed to participate continued in the survey immediately.

Seeing as a number of the initial sample population had decided not to participate, the researcher decided to increase the response rate of the study, through employing the snowballing method. This method involves the researcher approaching one member and that respective member, in turn, referring the researcher to another member (Mashaba, 2005:38).

In this case, this methodology fit well because the researcher was able to request some of the respondents to refer her to other organisations that fit the criteria of study.

3.5.5 Unit of Analysis and Observation

A unit of analysis can be prescribed as the specific entity which a particular research study endeavours to analyse (Trochim, 2006:1). This may include such entities as "individual people (e.g. pupils), groups of people (e.g. a classroom), or organisations (e.g. school)". On the other hand, the unit of observation is the unit which would be described by the data.

In this research study, the units of analysis comprised of organisations; particularly those NPOs that operated in the Western Cape and were "project-implementing" during the course of the study. The units of observations however became the individuals or the respondents who were requested to provide details such as how long the NPOs had been in existence, the areas of expertise they covered and how their projects performed, all which assisted to create a composite picture of the organisations under study.

3.5.6 Data Collection Instrument

As this was a quantitative study, the researcher elected to use questionnaires to collect data. This instrument falls under the non-experimental research approach (Thompson & Panacek, 2007:167). It fit well with the study because it is an "ex post facto" survey tool, as this research was also retrospective in its nature. This is confirmed by Salkind (2010:450), who ascribes that with non-experimental research, the subjects are studied after the fact and conclusions about different relationships derived post hoc.

Fox & Bayat (2007:89) describe a questionnaire as "a list of questions, which are compiled by a researcher in order to conduct a particular investigation, which are either written or asked orally, to obtain relevant information or answers from respondents". The researcher elected this instrument due to the advantages that are cited by Sauro & Lewis (2012:243) that questionnaires enable the gathering of objective and unbiased information. The element of objectivity and bias were further tackled as the respondents were not requested to give their identification details and therefore were able to answer freely while anonymous.

Standardised questionnaires were used as the data collection instrument. This type of questionnaire was relevant for this study because as Sauro & Lewis (2012:243) impute, standardised questionnaires assess participants' perception regarding the usability of products or systems. They further add that these types of questionnaires are designed for "repeated use, typically with a set of questions presented in a specified order using a specified format". Seeing as the study was designed in such a way that it could be replicated, the standardised questionnaire, therefore, satisfied that criterion.

While standardised, the questionnaires themselves were semi-structured in that they included both closed and open-ended questions. The questions included in the tool were derived and informed by the research questions and the research objectives aforementioned. Secondary sources of data in the form of existing research quoted in the literature review were also used to inform the questions that were asked.

The questionnaires were divided into four sections, namely:

1. Organisation and Projects Profile – this section was set to explore the organisational and project history of the organisations.
2. PMS – this section was set to investigate whether the NPOs are familiar and/or make use of the PMS. Also if they view PMS as an enabler to project in their organisations.
3. Other factors and recommendations – To allow the organisations to give insight to the tools they use and how those assist them, as well as share any other detail they feel like sharing.
4. Demographics – this section was set to determine the roles played by the various respondents in their respective organisations, their educational background and their occupational levels.

A copy of the questionnaire is included in this document as Appendix A.

It should be noted, however, that the limitation with this methodology is that it lacks the control needed to effectively demonstrate effect. In this study, the researcher aimed to determine whether the application of software influences project success.

3.5.7 Designing the Questionnaire

At the fore of each questionnaire was a standardised cover letter whose contents included the research topic, importance of the study and respondent's voluntary contribution, respondent's confidentiality rights and assurance of ethical implications of the study.

Following the letter was then the questions. The wording of the instructions and the questions in the questionnaire was in simple and concise English. The researcher made use of open-ended as well as closed-ended questions. The purpose of the closed-ended questions was to get factual and straight to the point while the open-ended questions were included to get in-depth responses from the respondents particularly around their experiences with the software.

In designing the format of the questionnaire, the researcher firstly consulted other questionnaires that had been used in studies related to the field of project management and more particularly regarding PMS. Secondary sources of data in the form of existing research quoted in the literature review were also used to inform the research questions. Thereafter the

researcher also looked at ensuring that her research aims, objectives and questions were tackled in the questionnaire.

After collating the above and developing a draft, the researcher consulted CPUT's statistician, regarding ensuring that the questionnaire met the objectives of the study. Following the revisions prescribed by the statistician, the researcher then piloted the questionnaire among four people from the research population but outside the sample population. From their feedback, the researcher was able to do the necessary modifications and amendments to ensure the length, lay-out, complexity and wording was up to standard. This all gave rise to the final tool; a 5-page questionnaire which was taken to the field. The questionnaire is attached as Appendix A.

The following table shows the matrix behind the questionnaire design:

Table 3.1: Research Matrix

Research Objectives	Research questions	Corresponding in questionnaire
Establish if PMS is applied in the NPO's work.	Which project management software are used within the NPO's?	1-8
Determine employee's interactions with PMS relative to project success.	What are employee's perceptions of the PMS in use?	9-10, 12-13
	Is there a relationship between the use of PMS and the success of the projects?	15-21,22-23
Identify the limitations of current PMS being used	What are the shortcomings of the current software?	11,12-14

Ultimately, the questionnaire consisted of 27 open-ended and closed-ended questions. These were categorised into four sub-sections, which were subsequently used in the analysis of data. These are:

Section A: Organisation and projects history
Section B: Uptake of Project Management Software
Section C: Other factors and recommendations
Section D: Demographics

3.5.8 Reliability, Validity and Prevention of Bias

Reliability and validity are important to consider when looking at the research instrument. (Burns & Burns, 2008:420), go on to even say, “an instrument with very high reliability but poor validity is unproductive, and the reverse is also true”. The reliability of a research instrument is said to refer to the consistency of a measure, which is the ability of an instrument to obtain uniform results each time that it is used (Adams & Cox, 2008:18). This is corroborated by Burns & Burns (2008:414) who define reliability as an index of the temporal reliability or stability over time of a research instrument, which is obtained by correlating the results of successive assessments.

Validity on the other hand, is defined as the ability of the instrument to measure what it is supposed to be measured (Adams & Cox, 2008:18). Bias is any tendency, which prevents the unprejudiced consideration of a question (Pannucci & Wilkins, 2010:630). The writers proceed to state that bias can cause systematic or random errors during this phase of the research.

For the purposes of this study, the researcher ensured the validity, reliability and prevention of bias of the instrument through the following measures of; a peer and literature review, panel of specialists review as well as a pilot study:

Peer and literature review

Firstly, the instrument was peer-reviewed by various parties who included fellow postgraduate students and industry fellows. This also included doing an in-depth literature review exercise. This exercise enabled the identification of what was already known in the respective field of study as well as gaps that existed. Through this, there was identification of possible questions to take to the field.

Panel of specialists’ review

Secondly, as advised by Hair, Tatham, Anderson, & Black (2006:92), who state that in order to ensure the content validity of a research instrument, a panel of judges or specialists in a relevant field should be consulted to verify whether the questions or statements which are contained in it measure what they intend to measure. The researcher consulted with her supervisor, who has a vast amount of experience in the field of project management. The instrument was also reviewed by the university’s statistician. Lastly, the questionnaire was also reviewed by the esteemed CPUT Research and Ethics Committee.

Pilot study

Thirdly, the researcher also did a pilot study where the questionnaire was presented to some members of the research population. The purpose of the pilot study was to enable the identification of sources of misinterpretation, ambiguity and measurement error and thereby

eliminate them. Following their valuable feedback, and the restructuring and modification of the questionnaires as advised, the researcher then took the instrument to the field for completion.

All the above three steps were conducted to consequently improve the content (questions and lay-out) of the instrument so that it aligns with the stated aims, objectives and research questions of the study as well as the conclusions that had drawn from the literature review. The steps also enabled unbiased reflections to ensure that the instrument could yield the desired results that would enable the researcher to make an analysis and be able to draw valid and reliable conclusions. Therefore, on this basis, the instrument was considered to be reliable and valid for the purpose of conducting the survey.

3.6 Ethical Consideration

Though this research was non-experimental, the researcher was careful to observe most ethical guidelines. Using the guidance of Trochim (2006:1), which advocates that there are five essential ethical concerns to be addressed when conducting research, namely voluntary participation, informed consent, no risk or harm to the respondents, confidentiality, and anonymity; the researcher discusses them below.

3.6.1 Clearances and Permissions

The research topic and study was cleared internally by the Higher Degrees Committee and the CPUT Faculty of Business' Research and Ethics Committee respectively. Permission to do the study and particularly collect data was granted, and the respective ethical clearance certificate is added as Appendix B to this document. A permission letter approving the conducting of the research within one of the organisations is also attached as Appendix C.

3.6.2 Risk/ Harm

The request detailed that the data collected would be solely used for academic purposes and that there would be no contractual or legal ramifications to the participation of the respondents. This meant that they would not be subject to any judicial or fiducial repercussions due to their participation in the study (Fischer-Hubner, Furnell & Lambrinoudakis, 2006:182).

3.6.3 Informed Consent

The researcher was careful to enquire from the respective NPOs that all the participants were above the age of 18 as per the South African Basic Conditions of Employment Act No. 75 of 1997, and therefore not viewed as minors (South African Government, 2002). This was especially crucial for the NPO sector where volunteers are recruited and these may be under 18 years of age and therefore, unable to give informed consent.

3.6.4 Confidentiality and Anonymity

The researcher was also careful to be transparent in the explanation of the nature, purpose and aims of the research being undertaken. Assurance of confidentiality and guaranteed anonymity of the information provided by the respondents was given; hence for example, no names or identification documentation were collected or recorded (Fischer-Hubner et al., 2006:182).

3.6.5 Voluntary Participation

Respondents were requested to give information voluntarily and no coercion or bribery was used and all rights to privacy were duly noted and respected.

3.7 Data Collection/ Fieldwork

Due to the manageable size of the study, the researcher conducted the fieldwork independently. Secondary sources of data, including the Provincial Department of Social Development and Sangonet's databases, were used to identify the relevant NPOs in the Western Cape which did/ applied project management in their work. From the findings that there were at least 200 units of analysis, the researcher used a statistical calculation as highlighted in Equation 3.1 earlier to deduce a research sample size of 132. The respondents were project members of varying roles in the selected NPOs; for example, project support, project technical or project managers.

These respondents were approached via e-mail with an initial request to participate in the study. Some respondents agreed to participate in the survey, while some had reservations that needed to be addressed and some declined participation. Ultimately, those that had agreed to participate continued in the survey immediately.

Seeing as a number of the initial sample population had decided not to participate, the researcher decided to increase the response rate of the study, through employing the snowballing method. This method involved requesting participating organisations to refer the researcher to other organisations that fit the criteria of study.

Following the above, the researcher conducted the fieldwork in the following two ways, depending on her arrangements with the respective NPOs:

- **Physically** – in this instance, the researcher physically visited the sites where the NPOs were based. To do this effectively, she firstly arranged with the NPOs willing to go through this route a suitable date and time when she could do the distribution. On the select day, the researcher managed the process of distributing the questionnaires to the respondents and collecting them thereafter.

- **Electronically** – seeing as most NPOs have time constraints, the researcher elected to have an option available where questionnaires could be completed electronically via e-mail or via the online tool, Google Forms. The advantage of this method was that they were able to complete the questionnaires at their leisure and not hurriedly.

3.8 Data Coding and Analysis

Of the aforementioned sample size, 94 responses were received, which set the response rate at 71.2%. As the researcher had elected to use the quantitative approach in collecting the data, she chose to use the SPSS program to code and analyse the data. The SPSS program was ideal because it allowed the researcher to bring order, structure and significance to the data collected as prescribed by Marshall & Rossman, (1990:111).

Seeing that the study would have taken a quantitative approach, a descriptive statistical approach will be used to analyse the data (Stehlik-Barry & Babinec, 2017:446). This approach is favourable because as alluded to thereafter, descriptive statistics are broken down into measures of central tendency and measures of variability, or spread which is what will be applied in this study.

3.9 Conclusion

This chapter gave details of the design and methodology employed in this research study. The research was quantitative in nature. Regarding the design, details were shared of the research paradigms, background, questions, and objectives used to inform the study. On the side of the methodology, the researcher gave details of the research population and location, how they went about selecting the sample size and the respective respondents as well as the data collection methods and work done.

Questionnaires facilitated the data collection, and a mixed methodology of convenience and snowball sampling was employed in selecting the participants to the study. The researcher also speaks to the validity and reliability of the study. Issues of ethical consideration including clearances, confidentiality, risks and voluntary participation were also discussed in this chapter.

Lastly, the researcher then gave a highlight of how the data would be coded and analysed. This, together with the details of the findings of the research, will be discussed in detail in the next chapter.

CHAPTER FOUR
FINDINGS AND DATA ANALYSIS

4.1 Introduction

This chapter will present the results of the data that was collected from the NPOs in the Western Cape. Firstly, the researcher will give a snapshot of the research methodology as is relatable to the findings of the study. Thereafter, the findings from the quantitative data which were obtained from the administered questionnaires (attached as Appendix A), will be discussed in full detail and in relation to the research objectives and questions.

4.2 Response Rate

As stated in the previous chapter, the study was focussed on project-implementing NPOs in the Western Cape that employ project management in their work. The units of analysis were determined to be at least 200 and the sample size 132. Of the aforementioned sample size, 94 responses were received, which set the response rate at 71.2%. According to Nulty (2008), a response rate of 60% to 75% is accepted as adequate. Taking from the above, the results can therefore be taken as a true depiction of project-implementing projects in the Western Cape.

4.3 Findings

The results gathered from the data collection phase were analysed using SPSS. This software is widely used as an analytics resource and allows for accurate, simplified and fast insights into data, thereby enabling a quicker turn-around in decision-making (SPSS, 2016).

The results will hereafter be presented in the form of graphics and tables; and as they relate to the research sub-objectives and questions.

4.4 Section A: Organisation and Projects History

The purpose of this section was to explore the organisational as well as the project history of the NPOs including their project success rates. As Anheier (2000:43) alludes, there is a need to see NPOs from a different angle and that is from “a strategic-developmental dimension that sees organisations as evolving systems encountering problems and opportunities that frequently involve fundamental dilemmas; and an operative dimension that deals with the everyday functioning of organisations”. This section therefore, strategically looks at the NPOs,

particularly the history of the organisations themselves as well as the performance of their projects over the past years.

4.4.1 NPO age

The purpose of this closed-ended question was to find out for how long the NPOs had been established. This would then also inform the researcher of the systems and culture that the NPOs have. Depending on the organisational culture, those standards may mean either adapting or not adapting to changes in the technological environment. The results from this inquiry are shown below:

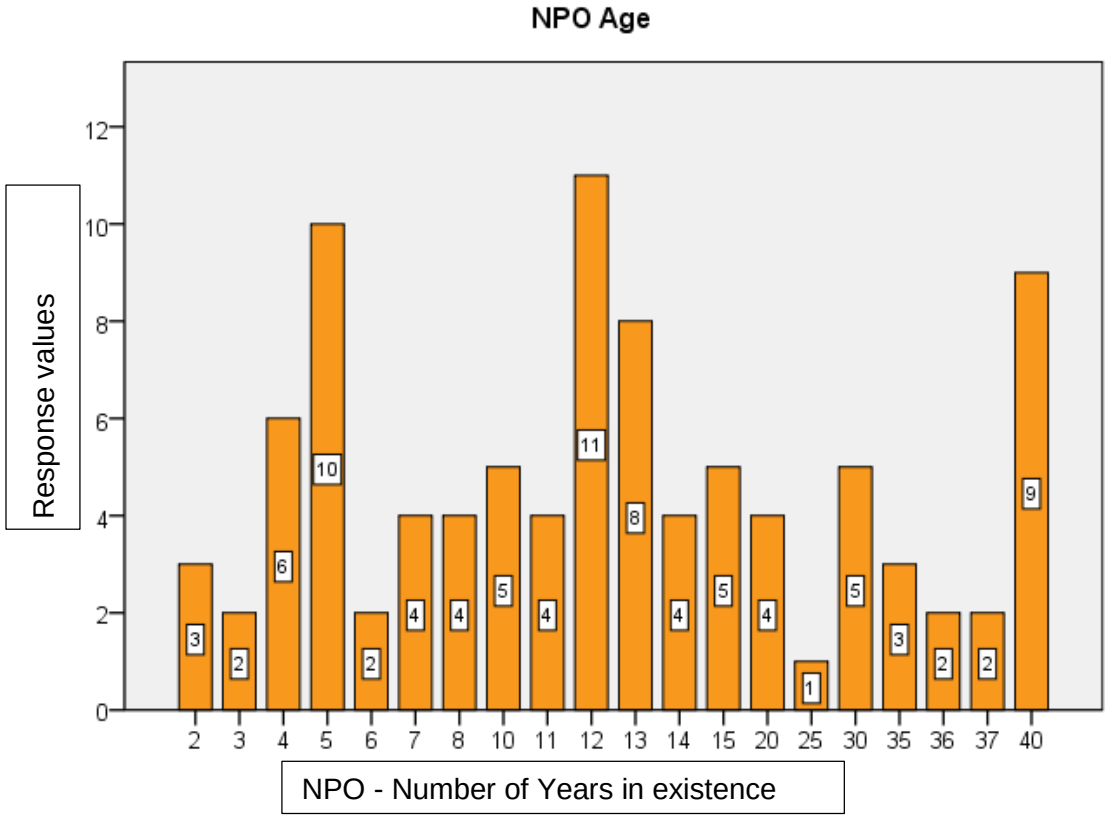

Figure 4.1: NPO age

The results show a wide range of ages of establishment of the NPOs with the oldest NPO that was interviewed being 40 years in operation and the youngest was 2. This is significant to show that regardless of the varying economic, political, social and environmental trends that South Africa has gone through and that are reflected in the literature review chapter, the NPO sector stands strong with some new organisations even coming to play.

The issue of the ages of the NPOs is pivotal in that a peak of 40 years shows that there is room for NPOs to evolve and to grow. This growth may be in terms of procedures and systems employed including the technological systems. From this, a positive relationship between the ages of an organisation and its size and capacity for growth is then initiated.

4.4.2 Size of the organisation

The purpose of this inquiry was to determine the sizes of the organization. The number of employees in a respective organisation was used as a direct measure of its size. The results from this inquiry are shown below:

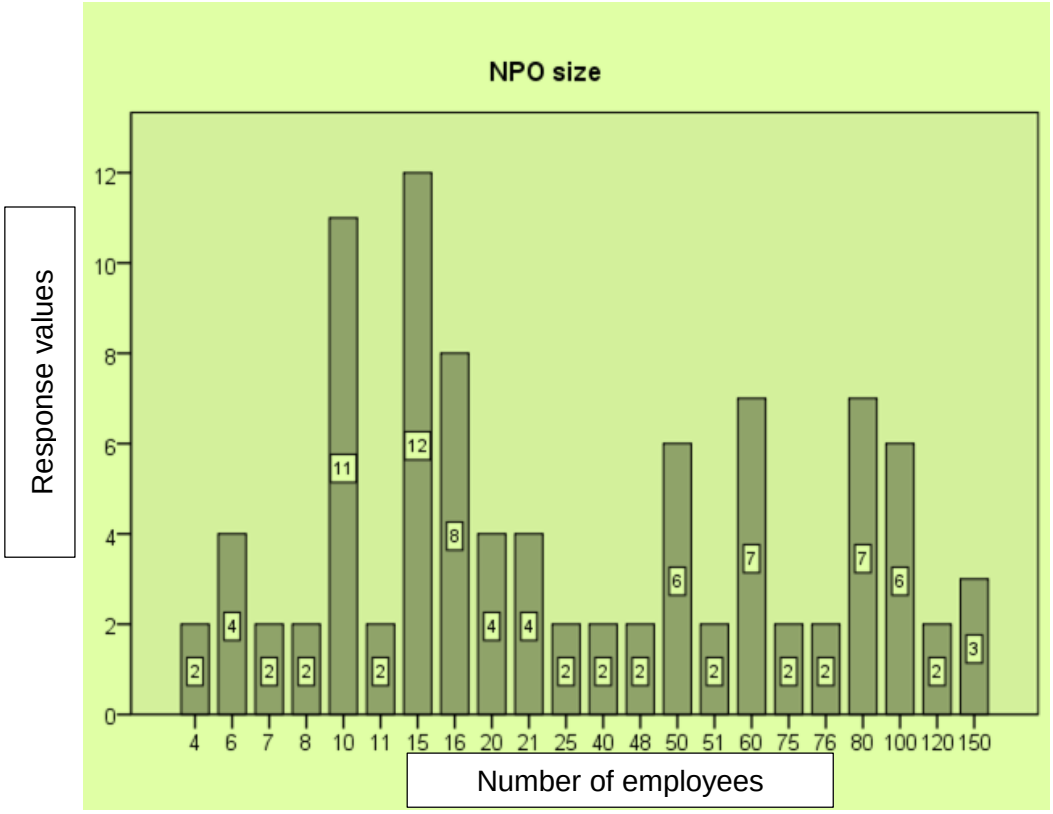

Figure 4.2: NPO size (employees)

In this case, the range is again wide, for the sizes of the organisations. The biggest size of NPO is the one with 150 employees while the smallest one has 2 employees. The most popular sizes were 10, 15, 16 and 60 employees. This disparity and the varying numbers reflected in the chart shows that NPOs can exist in small sizes with potential however, to grow to bigger sizes. This shows that NPOs can also contribute significantly to job creation.

4.4.3 Years in current employment

The purpose of this closed-ended question was to determine how long the respondents had been at their respective organisations. This will give us insight as well as to the relationship between how long a person is employed and whether they make use of PMS in their work. The findings from this inquiry were as follows:

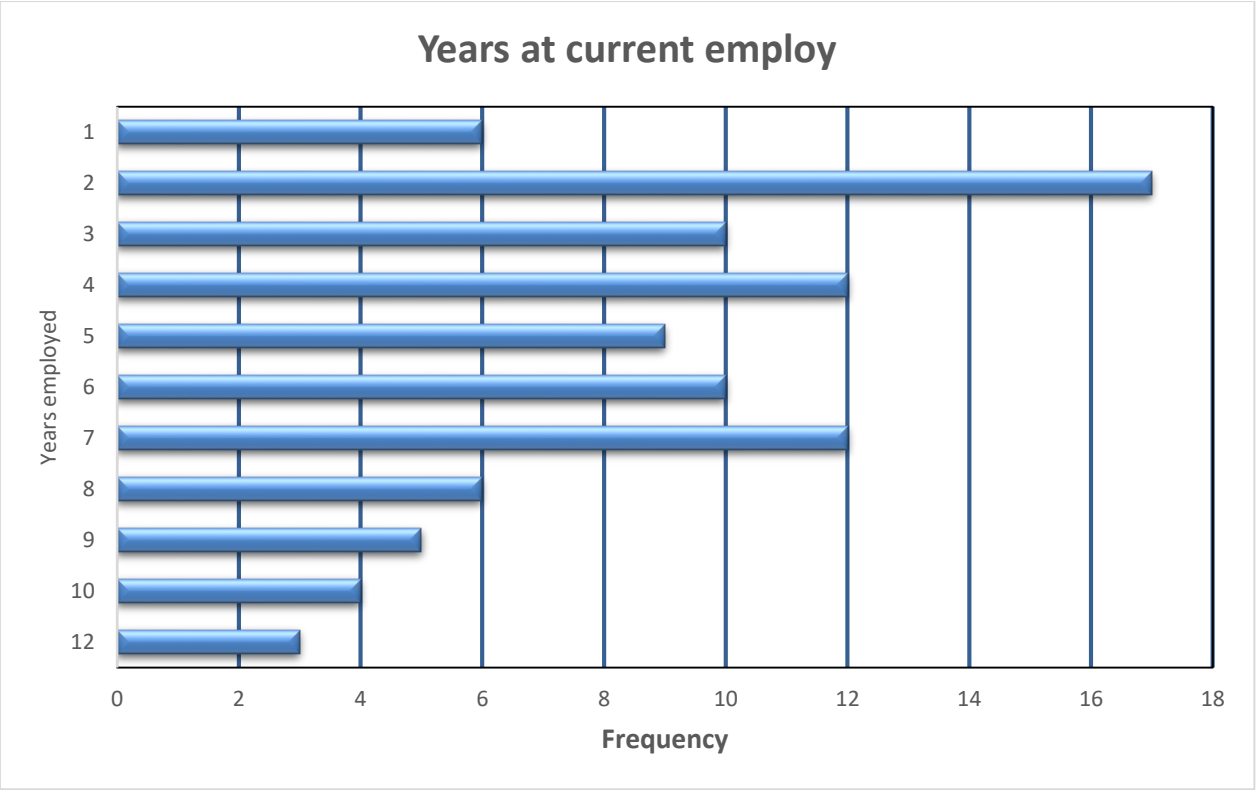

Figure 4.3: Years employed

In this scenario, we find that the range of years that people have been employed is from 1 to 12 years, with most people being in the 2 to 7 years range. Most people have been employed for 5 years or less. These findings can be juxta-positioned against those of Froelich (1999) that indicated that most NPOs rely on external funding and have very limited entrepreneurial activity to boost their cash flow, hence the need for them to diversify their revenue streams.

Even with an almost 20 years' gap in the research, the funding landscape of most NPOs remains the same. This therefore, has an impact on how long employees actually remain employed in the organisations, which in this case is below five years. It also has an impact on how long the employees would be able to influence the technological systems in the organisations they are in.

4.4.4 Number of projects you have been involved in

The purpose of the question is to find out the respondent's exposure and experience (measures in number of projects) with regards to projects. Due to their involvement with projects, it is inferred they would then be knowledgeable about the project life cycles.

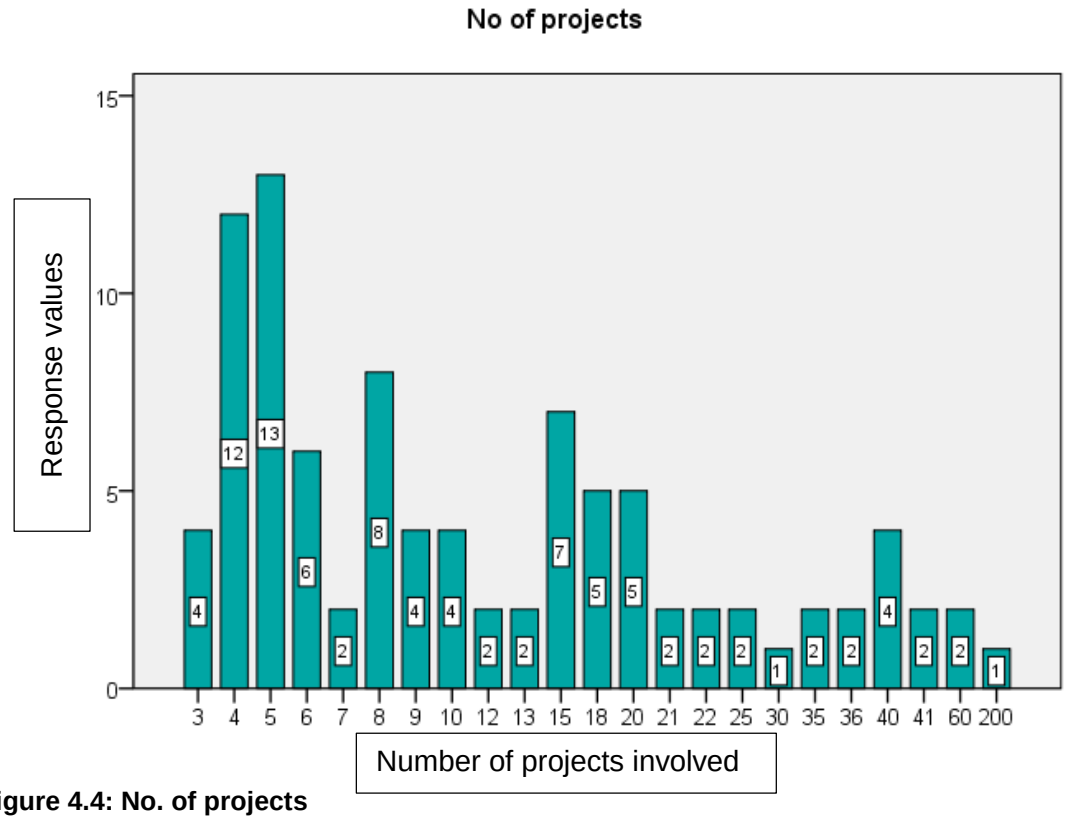

Figure 4.4: No. of projects

The findings reflect a wide range of project involvement. The highest number of projects one has ever been involved in being 200 and the lowest being 3. A high proportion of people have been involved in at least 5 projects while the mean for this inquiry is 8 projects. Leaning from the findings of the previous questions where the average employment age of respondents was 5 years, it is interesting to note that this means most employees engage in on average 2 projects annually. This reinforces the need for optimum and effective performance on these projects.

4.4.5 Types of projects you have been involved in

As NPOs are generally created for the good of social fabric, they operate over a wide spectrum of sectors where there is benefit for the general public. The purpose of this question was to unearth the various industries or sectors in which the NPOs would have been operating. The table below shows the findings derived for this statistic. The respondents were able to select multiple responses. The results of this enquiry are shown below:

Table 4.1: Type of projects

Projects			
		Responses	
		N	Percent
Projects involved in[a]	Information and Communication Technology	15	16%
	Justice, Social, and Legal	15	16%
	Infrastructure and Capital Development	7	7%
	Education	23	24%
	Agricultural, Environment and Tourism	15	16%
	Health	19	20%
Total			100.0%

As shown in the table, most people are involved in education projects; a total of 23 representing almost a quarter of the population. Next in popularity are health projects at a total of 19 thereby representing at least 20% of the population. Education and health are key areas for concentration for the civic society. This finding is in sync with the worldwide development focus as expressed by the Sustainable Goals for Development (SDG) which are formulated by the United Nations (UNDP, 2018). The Sustainable Development Goals (SDGs) that include good health and well-being, quality education, decent work and economic growth hinge on great alignment and relationship with education and health.

The least numbers were received for the ICT and agricultural, environment and tourism categories; which both sat at 16% respectively. Of note is that in this age of digital of times, ICT is not better represented in the civic society. This is concerning as it may reflect a slower uptake of ICT in the civil sector. This however, may also be due to the fact that some of the ICT numbers are accounted for in education where people are trained in ICT skills.

4.4.6 Selection criteria for projects

The pivotal question that many a scholar in the project management field have asked is which one is the most important selection criteria when selecting projects. Ahonen et al. (2015:208) describe that projects vary in terms of their sizes and where they are located in an organisation. Project selection criteria also differ depending on a variety of factors including the type of industry amongst others.

The civic sector and how it goes around selecting projects may be different from how the public or private sectors choose to select theirs. This also goes for how the tourism industry differs from the health industry in terms of selection. The purpose of this question is, therefore, to extract how NPOs go about selecting projects. The respondents were able to select multiple responses. The results of this enquiry are shown below:

Table 4.2: Selection criteria

		Responses	
		N	Percent
Selection criteria for projects[a]	Availability_of_funding	71	25.4%
	Financial_benefit	11	3.9%
	Alignment_to_organisational_values	71	25.4%
	Stakeholder_relationships	27	9.7%
	Technical_risk_and_feasibility	16	5.7%
	Team_skills_and_competencies	15	5.4%
	Other	68	24.4%
Total			100.0%

The findings revealed that the most popular selection criteria were the availability of funding and the alignment to organisational values as shown by the 25.4% popularity for each. The criteria that were least used in the selection of projects was team skills and competencies and lastly financial benefit at 3.9%.

This can be attributed once again to the funding and employment landscape within NPOs in that they are more dependent on external funding and therefore, will acquire the necessary team skills and competencies, once funding is available. Also, they are called NPOs because they indeed do not exist primarily for profit and hence financial benefit is not necessarily a top priority for them.

4.4.7 Project success criteria

The purpose of this inquiry was to get the perceptions of what is seen as project success in the NPO sector. As previously stated in the literature review chapter, the research of Todorović et al. (2015), reflects that “project success analysis, presented through the definition of critical success factors, key performance indicators and performance-measuring process has a very positive influence on knowledge acquisition and transfer in project environment”. In ascertaining the criteria, we therefore, also will later be able to look at its relationship with knowledge of systems and technology such as PMS. The respondents were able to select multiple responses. The results of this enquiry are shown below:

Table 4.3: Project success criteria

		Responses	
		N	Percent
Project Success[a]	High_quality_outcomes	28	24.6%
	Acceptance_by_end_user	34	29.8%
	Usability_by_end_user	19	16.7%
	Completion_on_budget	33	28.9%
Total		114	100.0%

The most common criteria were that of acceptability by end-user, at almost 30%. Also high in popularity is completion on budget with almost 29%. These results are in alignment with the sentiments of Duncan (2013) who expresses that the "most common indicators of project performance are quality, cost and time; while stakeholder acceptance has also lately been accepted as criteria". The criterion with the lowest vote was usability by the end-user at almost 17%. It can be noted that though this received the lowest vote, it was still quite popular thereby showing that the NPOs are becoming more and more end-user centric.

4.4.8 Successful projects

Previously, the researcher made an enquiry as to the number of projects that the respondents had been involved in. It is important to delve into the project success rate, as stated in the recommendations of Wald et al. (2015:26), that successful projects are very important for organisations as they have a direct link in the long-run to the innovation and business success of the very same entity. The purpose of this inquiry was mostly to compare the number of projects they had been involved in versus how many of those had been actually successful. The table below reflects the findings of the current inquiry.

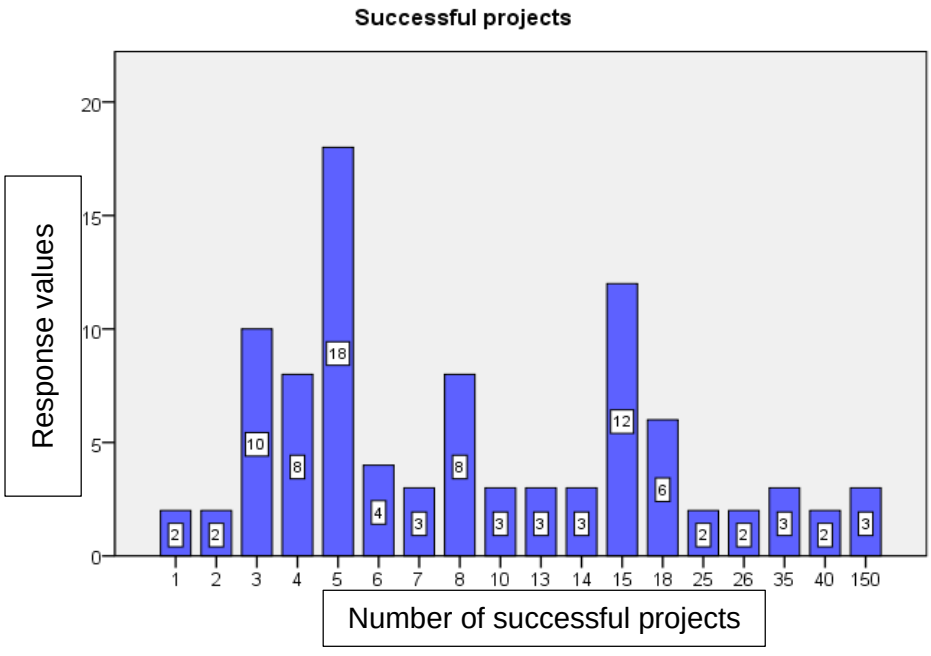

Figure 4.5: Successful projects

The results from the graph above show a wide range of involvement of the respondents with the least being 1 and the most being 150. Linking to the number of projects they had been involved in (Figure 4.4: No. of projects)), the above statistic is notable in that it shows the success rate of projects embarked in. Using the equation expressed by Maloney (2018), the success rate is found by dividing the number of successes by the number of trials. For the purposes of this study, this was found to be as follows:

$$Project\ Success\ Rate = \frac{Number\ of\ Successful\ Projects}{Number\ of\ Projects}$$

$$= \frac{983}{1276}$$

$$= 0.77$$

$$\underline{= \mathbf{77}\%}$$

Equation 4.1: Project success rate

From the above equation, it is evident that there is generally a high rate of project success amongst NPOs in the province. When this is juxta-positioned against the ages of the NPOs as depicted in Figure 4.1: NPO age, there seems to be suggestion that most project-implementing organisations are doing well. The subsequent inquiries will reveal the factors working for and against this statistic.

4.4.9 Project stage affecting project success

As indicated by Esposito (2015) in the literature review, there are at least 5 stages in the project lifecycle and those are project initiation/ conception, project planning/ organising, project execution/ implementation, project control/ performance and project closure. These stages present with them different characteristics and therefore, this inquiry looks at which of those stages have an impact on project success the most. The respondents were able to select multiple responses. The findings are stated in Table 4.4 below:

Table 4.4: Project stage affecting success

		Responses	
		N	Percent
Project Stage affect success[a]	Project_initiation_or_conception	47	20.8%
	Project_planning_or_organising	65	28.8%
	Project_execution_or_implementation	51	22.6%
	Project_control_or_perfomance	55	24.3%
	Project_closure	4	1.8%
	Other	4	1.8%
Total		226	100.0%

Proper planning/ organising was highly ranked at almost 30%. This can be attributed to our earlier findings regarding the criteria for project success that revealed that acceptance by the end-user, and completion on budget, were the most popular criteria determining project success. These two criteria are usually determined mostly at this planning phase where funds are organised, budgets set and plans regarding the end-user requirements incorporated into the project plan. It is therefore logical that proper planning or organising be ranked this high. Proper execution and control are the next to be ranked highly at close to 25% of the vote while proper closure received the least vote at 4%.

4.4.10 Challenges in attaining project success

It is to be noted that the management of projects is not without its challenges. As MacMahon (2001:45) ascribes in the literature review chapter, if these challenges and other underlying causes of the root problems are not resolved timely and effectively, then project failure would be inevitable. It is therefore important that the challenges are clearly identified and addressed. The respondents were able to select multiple responses. Table 4.5 below gives the results of this inquiry.

Table 4.5: Challenges to project success

		N	Percent
Project challenges[a]	Resistance_to_change	29	16.2%
	Inadequately_defined_requirements	49	27.4%
	Insufficient_resources	65	36.3%
	Technology_gap	20	11.2%
	Poor_communication	16	8.9%
Total		179	100.0%

The greatest challenge that was identified is insufficient resources at 36% and closely followed by inadequately defined requirements at 28%. It is interesting to note here that once again these challenges are related to the findings on the inquiry on the project selection criteria. The latter revealed that completion on budget and acceptance by the end-user are the most important criterion. If we correlate this to the current findings, we see that if those criteria are not managed properly and at their relevant project stages, then they pose a challenge. The findings reflect that poor communication at almost 9% is the least of the challenges faced in the NPOs.

Summary of Section A

The average age of years that the NPOs have been in operation is 12 years. The NPOs vary widely in sizes (as measured according to the number of employees) with the most popular sizes having been 10, 15, 16 and 60 employees. Most of the people have been employed for 5 years or less. The exposure to projects that employees face varies widely with the highest number being 200 and the lowest being 3.

Education and health projects are the most popular projects being implemented. Availability of funding and the alignment to organisational values are the main criteria used to select projects. Proper planning/organising is viewed as the most important stage to focus on as it highly influences project success. Acceptability by end-user and completion on budget are the most common identifiers of project success. The main challenges to project success are insufficient resources and inadequately defined requirements.

The purpose of this section was to explore the organisational as well as the project history of the NPOs including their project success rates. In the subsequent section, we delve deeper into the objectives of the research in that we explore and link the historic information given of the organisations and their subsequent knowledge and interaction with PMS.

4.5 Section B: Uptake of PMS

The purpose of this section is related to the preceding one in that it delves into linking the historic information provided of the organisations and their subsequent knowledge and interaction with PMS. This speaks to the research objectives 1, 2 and 3 reflected in Section 4.3 earlier as well as the subsequent research questions. As depicted in the literature review, there are a number of definitions to describe exactly what PMS is; the most popular of these being that it is “software used for project planning, scheduling, resource allocation and change management” (Techopedia, 2016). Following the investigation of usage, this section will also look at whether PMS is an enabler to project success in the respective organisations where it is utilised.

4.5.1 PMS Knowledge

As described above, PMS is tool that can be used for various purposes and at various project stages depending on its design. Duffy (2018:110) alludes as well that, PMS provides, “real-time workspaces and lets team members and outside partners keep an eye on every detail that brings a project to fruition”. It is pivotal, therefore, that where it is applied, PMS is known by the respective project team members. This inquiry’s purpose is to find out if people do know of or about PMS. The respondents were able to select multiple responses:

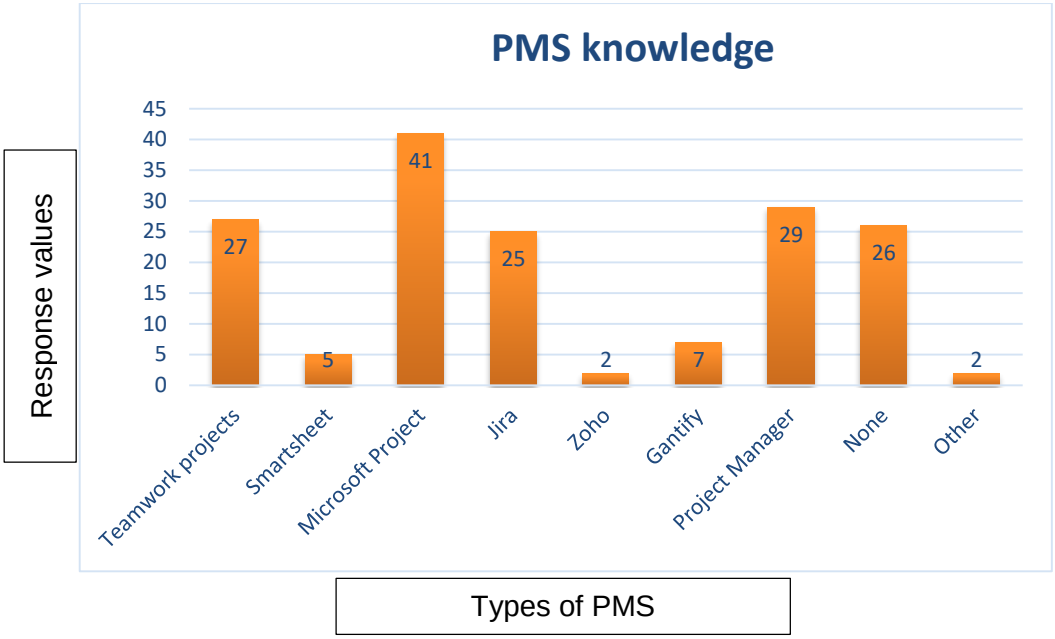

Figure 4.6: PMS knowledge

Microsoft Project was identified as the most popular PMS known. This can be mostly attributed that the package is a product of Microsoft which has been in operation for over 40 years (Schroeder, 2000). Furthermore, it can be synced with other Microsoft packages like Excel which are also very popular in the technological world. The least popular software packages among the NPOs were Ganttify and Smartsheet. As the list of PMS provided was not exhaustive, other respondents indicated that they used Asana, Scrum and Quire as other software.

Of particular interest is that almost 25% of the respondents reflected that they did not know any PMS. As modelled in the questionnaire, the previous response prompted that they be redirected to a later question exclusively for enquiries about PMS usage. The other software packages that were indicated as being used are Asana, Scrum and Quire.

4.5.2 PMS use

This question sits at the heart of the study as it looks at which PMS is actually used in the respective organisations. The importance of use of PMS was stated in the literature review by Kostalova et al. (2015:412-420), who in their study found out that “an important function offered by a Project Management Information System is the possibility of sharing data concerning the running projects across the project team and their surroundings”. The respondents were able to select multiple responses. The table below shows the findings from the respondents who reflected that they knew PMS and this now explores whether the NPOs are making use of this technology.

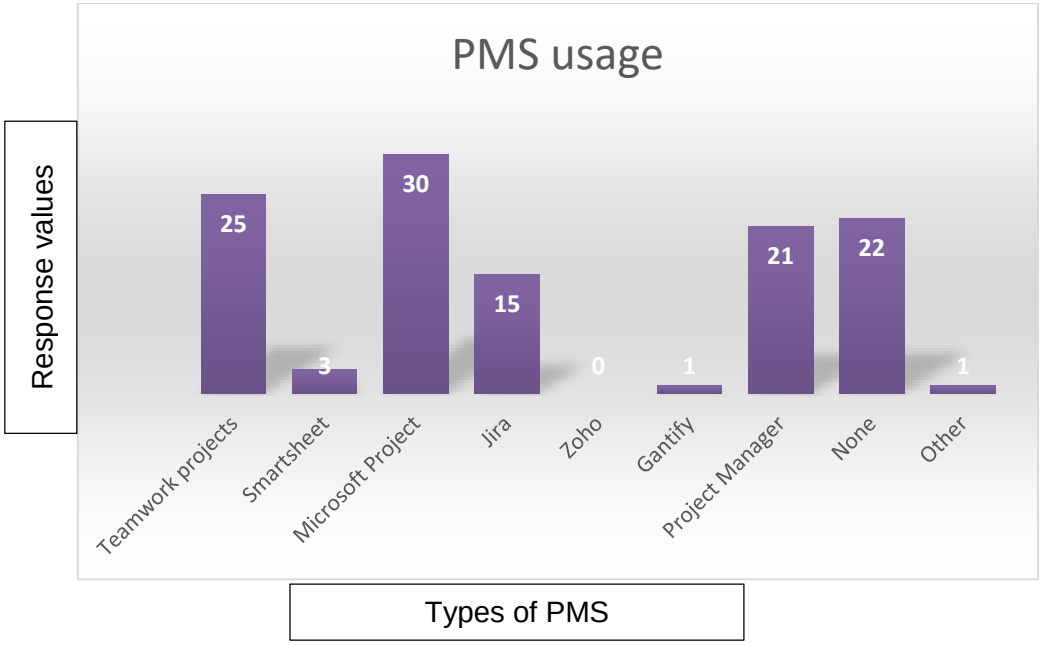

Figure 4.7: PMS usage

The most commonly used PMS is Microsoft Project. This finding is similar to that of the previous question which enquired on which PMS was known to the respondents. It is logical that the one PMS most known is also the one most used. Jira, Teamwork Projects and Project Manager were also quite popular with over 40% collectively in usage. Very few organisations use Ganttify and this could be attributed to that people are more familiar with and still use the physical Gantt charts than the electronic versions.

As this inquiry was addressed by people who already knew PMS, it is interesting to note that a high percentage of them (almost 25%) do not use the PMS in their work albeit knowledge of the software. There were also some variances to note between the knowledge of PMS and the actual usage. A comparison was drawn using the table below to show the differences and deviations.

Table 4.6: Variance of PMS known versus PMS used

		Responses		
		PMS known	PMS used	Variance
Variance between PMS known and PMS used	Teamwork projects	27	25	7%
	Smartsheet	5	3	40%
	Microsoft Project	41	30	27%
	Jira	25	15	40%
	Zoho	2	0	100%
	Ganttify	7	1	86%
	Project Manager	29	21	28%

The above table shows wide variances between PMS known and the ones used by respondents. This can be attributed to that though respondents may have prior knowledge of the PMS, their current environments in the NPOs would not be accommodating for them to use those particular skill sets.

This can be linked and attributed to the findings of Section A in Table 4.5: Challenges to project that showed that resistance to change and technology gaps were a limiting factor to project success. Therefore, in such environments, even though one had knowledge of PMS, they would not be able to utilise it in order to maintain the status quo of that organisation.

4.5.3 Frequency of use of the PMS

As stated in the literature review, software typically provides "an overview of the projects in the pipeline, as well as the nitty-gritty details about the daily work being done to move the projects forward" (Duffy, 2018:110). Therefore, an individual can use the tool as a yardstick for monitoring for a pre-determined time; such as daily, weekly or monthly.

The purpose of this inquiry is to determine the frequency of use amongst those who claim that they use the software.

Table 4.7: Frequency of PMS use

PMS_usage			
		Frequency	Percent
PMS Usage	Daily	11	11.6
	Weekly	23	24.2
	Fortnightly	7	7.4
	Monthly	23	24.2
	When need arises	11	11.6
	Never	19	21.1
	Total	94	100.0

The findings reveal that most users use the software either weekly or monthly. A substantial amount (11%), also make use of it either on a daily basis or when the need arises. On the other side, it should also be noted that though some have used and do have PMS being applied at their organisations, at least 19% of this population rarely ever use it. This statistic on usage can also be attributed to our previous findings in (Table 4.5: Challenges to project), that there may be resistance to change in the organisations or technology gaps that do not allow or promote the frequent use of the PMS.

4.5.4 Project stages for which software/s beneficial?

Our preceding inquiry showed bias toward weekly or monthly usage of PMS. The current inquiry looks at the “which stage” aspect of this particular usage. As previously reflected in the literature review, Jha (2011:25) raises the issue that “the advantages to using software in a project management environment include improvement in speed and accuracy and usability in all stages of the life cycle of the project”.

Though PMS can be used throughout the lifecycle, the researcher intended to unearth the project stage where the particular PMS was used. Multiple selections on the responses were permitted.

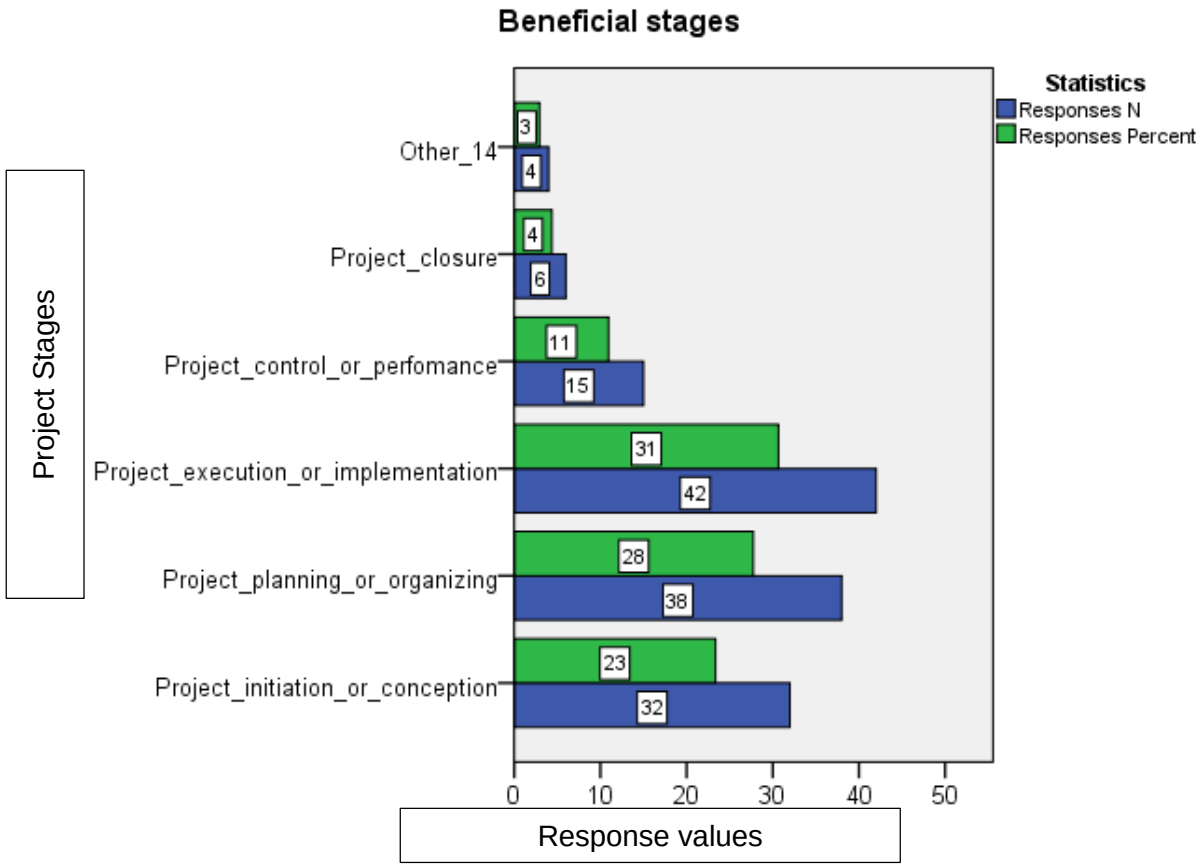

Figure 4.8: Project stages with PMS benefit

Project execution or implementation is the most crucial stage for which PMS is required at 31%. Also crucial is the stage of project planning or organising which came very close at 28%. The findings also show that PMS is required less at the project closure stage. Our previous findings on the project stage that has the most influence on project success had revealed that it was project planning or organising. Interesting to note is that logically, project execution and implementation are the next stage from this. Also to note is that at the project closure phase, most of the work would have already been done, hence PMS use and project success are least influenced at this stage.

4.5.5 **Limitations of the PMS**

The various limitations have been noted and discussed in the literature review by scholars and writers such as Ross, Romich & Pena (2016:48), Niazi et al. (2016) and Milosevic, Patanakul & Srivannaboon (2010:69). The purpose of the inquiry below is now to determine what the facts are, regarding PMS limitations for the "project-implementing" NPOs in the Western Cape. This inquiry directly responds to the third research objective, as previously stated in Section 4.3 The respondents were able to select multiple responses.

Table 4.8: PMS limitations

		Responses	
		N	Percent
Project Management Software limitations[a]	Unfriendly_interface	3	4.6%
	Time_consuming	19	29.6%
	Over_complicates_issues	26	40.6%
	Other	16	25
Total		64	100.0%

The findings reveal that a majority expressed that PMS overcomplicates issues, with a substantial number also revealing that using PMS can be time consuming. The statistic on PMS usage overcomplicating issues can be compared to the sentiments shared in the literature review chapter by Jha (2011: 27), that the advantages of the software are not remarkably visible for small projects as compared to the big ones. This is the case especially when we note that NPO projects are often times smaller in size than those handled in the private or public sector.

The statistic on PMS usage being time-consuming is aligned to the findings of Keller & Husig (2009) who wrote on that PMS and web applications are sometimes viewed by users as innovations that can be disruptive to the workflow. It is the researcher's opinion that the above limitations could also be due to the fact that there is limited training and refresher training offered to employees on PMS. Therefore, without that buy-in from the employee, the use of PMS may seem tedious.

Another popular opinion fell under the "Other" bracket, and the issues raised there regarding the limitations of the PMS include poor synchronising between devices, poor offline capabilities, lack of adaptability to local contexts and no localised support.

4.5.6 Additional/ new PMS use

The purpose of this inquiry was to explore with all of the respondents, that is, those with prior experience and those without experience, if they would be keen to try out additional or new software respectively.

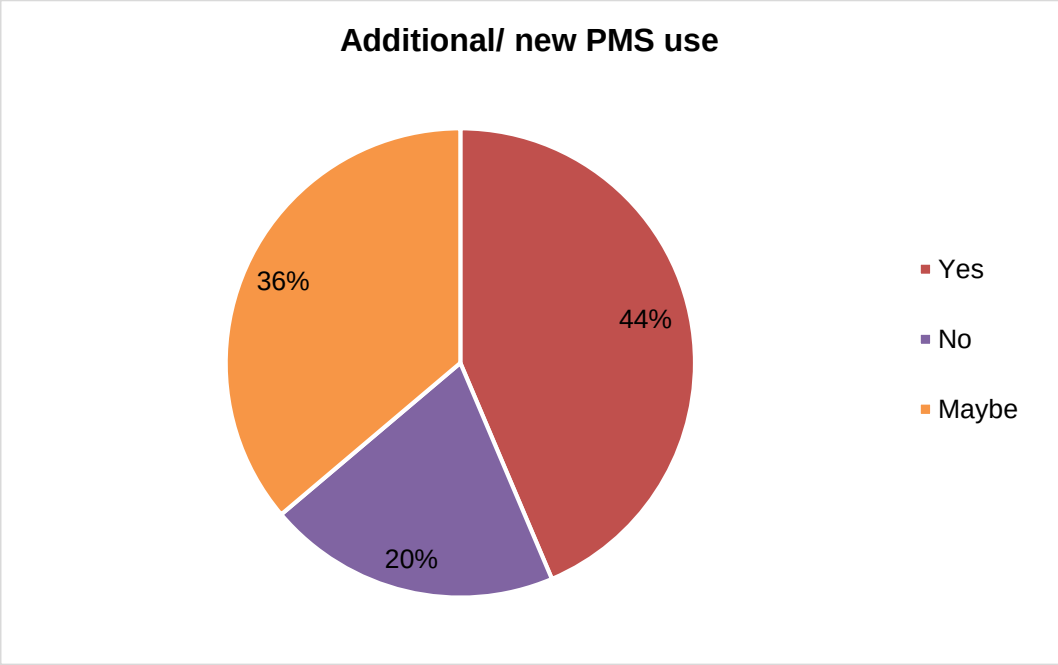

Figure 4.9: Additional/ new PMS use

The findings form this inquiry show that there is a large interest; with a total of at least 43% of the population showing that they would be keen to try it out while a further almost 37% were on the fence about potentially using the software. The group that is on the fence about the software can be swayed to give it a try under the right circumstances and thereby giving rise to the numbers that are in favour of using new or additional software. This improves the overall percentage of those who would be willing to give PMS a try.

4.5.7 Reasons for additional/new PMS

Flowing from the previous inquiry is the current one that looks at the reasons for wanting additional PMS. Binder (2007:42) expresses that though there is unlikely to be one perfect solution for everything, there are always options for solutions that fit a specific organisation or project better. It stands to reason, therefore that different people from different organisations would have different sets of requirements from the respective PMS. The respondents were able to select multiple responses.

Table 4.9: Reasons for using new/ additional PMS

		Responses	
		N	Percent
if_yes_explain	Save_time	33	37.9%
	Transparency	19	21.8%
	Risk_management	5	5.7%
	Accountability	21	24.1%
	Other	9	10.3%
Total		87	100.0%

A majority of the population revealed that they would employ PMS in their work if it saved them time. Also popular was that transparency and accountability were key indicators to motivate users to use new/ additional PMS.

Under the "Other" bracket, various respondents indicated that they would require new or additional PMS if it aided in better collaboration, coordination or teamwork. This is interesting to note especially in project environments where there is a need for a shared vision and focus. In this case, it would mean having everyone on board regarding the use of the PMS.

4.5.8 Reasons against the additional/ new project management software

With reference to the 20% of the respondents portrayed in Table 4.9 (Figure 4.9: Additional/ new PMS use) that responded negatively to using new or additional software and also from some of the 36% who were on the fence about it, we got the following results for their reasons against the usage of PMS. The respondents were allowed to select multiple responses.

Table 4.10: Reasons for not using new/ additional PMS

		Responses	
		N	Percent
If_No_explain	Too_time_consuming	12	29.3%
	Too_complex	10	24.4%
	Scope_too_small	15	36.6%
	Other	4	9.8%
Total		41	100.0%

The main observation was that the reason for not wanting the software was that their scope of work was too small to guarantee usage, while almost 30% revealed that using PMS was time consuming. These results are aligned to our findings regarding the limitations of PMS. In this case, we also find alignment to the sentiments shared in the literature review by Jha (2011:27) that the advantages of the software are not remarkably visible for small projects as compared to the big projects. This is the case especially when we note that NPO projects are often times smaller in size than those handled in the private or public sector.

The statistic on PMS usage being time-consuming is also aligned to the findings of Keller & Husig (2009) who wrote on that PMS and web applications are sometimes viewed by users as innovations that can be disruptive to the workflow.

4.5.9 Functionalities to add to PMS

Johansson (2017:310) gives insight into what makes PMS attractive to users, with examples being user support, scalability and ease of use, amongst others. The purpose of this open-ended question was to explore what functionalities would make the user experience more enjoyable in order for it to be beneficial to the organisations in which the people are. A wide range of responses were received for this inquiry, which were grouped into the responses reflected in the graph below.

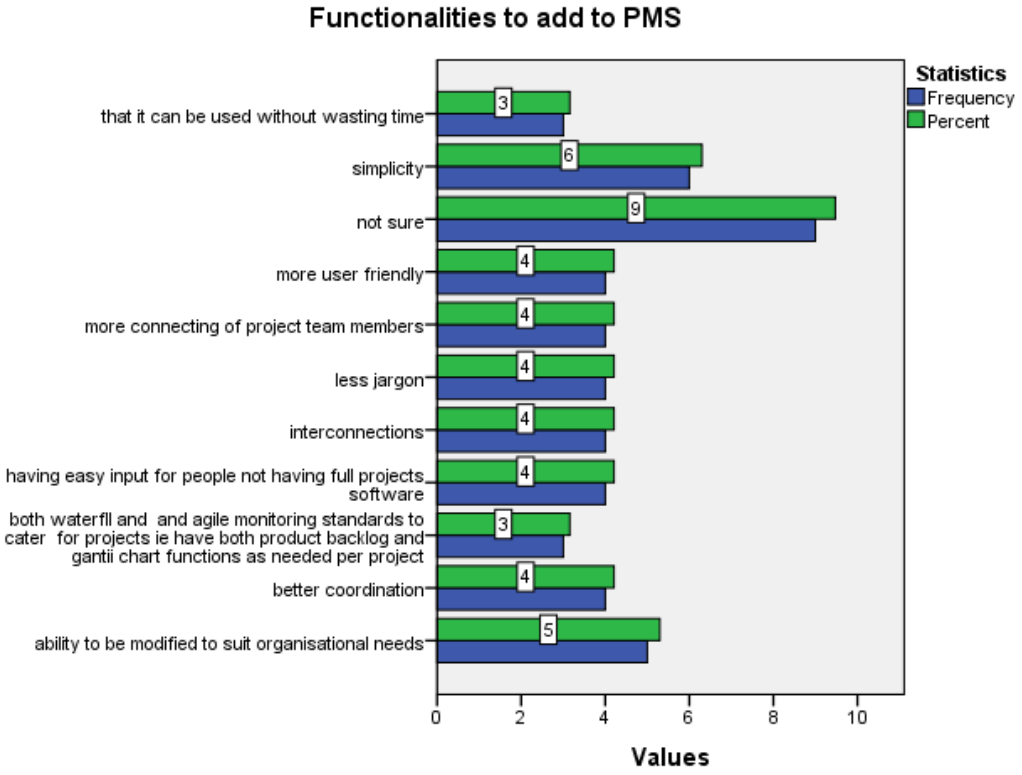

Figure 4.10: Functionalities to add to PMS

A number of people alluded that the scope of their projects was too small to warrant the usage of PMS. Another popular opinion was that PMS should be modifiable to suit organisational needs or the context in which they are to operate. In such cases, there would be a need to modify the PMS to suit the needs of the smaller NPOs. Another popular opinion was that of simplicity. Our findings earlier on why people do not use PMS also reflected that some of the respondents felt that the PMS was too complex; hence the suggestion we see herein about simplicity. Other functionalities received include, need for less jargon, more connectedness and better coordination.

4.5.10 Relationship between the use of PMS and project success in their organisation

Based on their professional and user experiences with PMS, the purpose of this question was to explore the perceptions of whether PMS does contribute to project performance and more specifically project success. The table below shows the responses received for this inquiry.

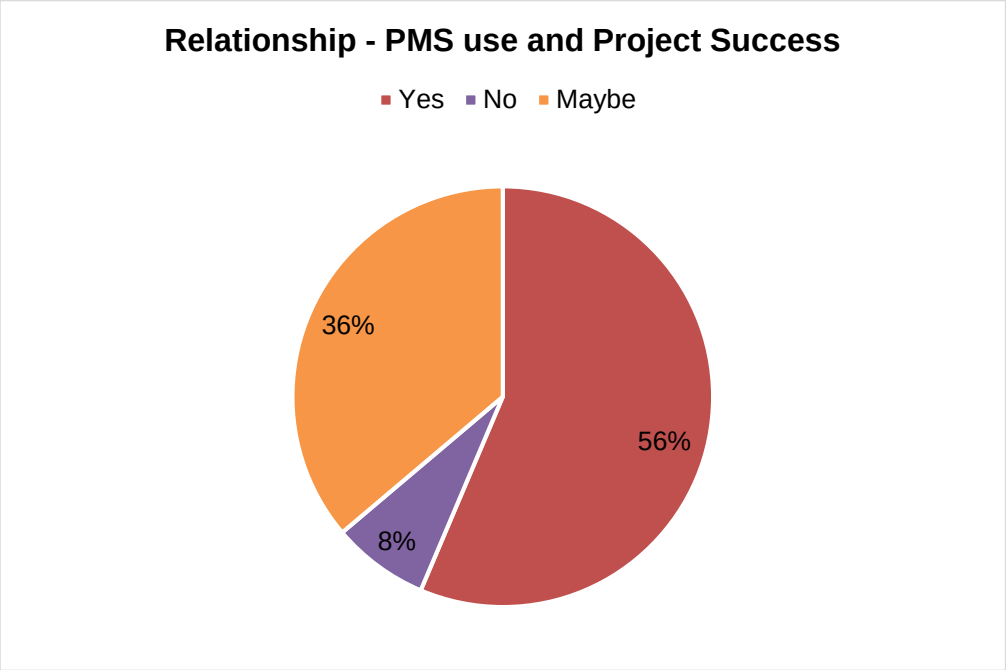

Figure 4.11: PMS use and Project success

With reference to the earlier findings regarding project success rates (Equation 4.1: Project success), it is interesting to note that over 56% of the respondents revealed that there is a positive relationship between the use of PMS and project success in their organization.

A significant portion of people were on the fence regarding the impact of PMS. This may be attributed to the fact that there was no control to measure if the success rates would be different if PMS is not applied. Lastly, 7.4% expressed that based on their experiences, there was no relationship between the two.

Summary of Section B

Section B delved into linking the historic information of the organisations provided in Section A to the subsequent knowledge and interaction with PMS that the organisations had experienced.

Some of the responses to the objectives and questions included that the most commonly used PMS are Microsoft Project, Jira and Project Manager. Most users employ PMS on a weekly or monthly basis. Project execution/ implementation and project planning or organising are viewed as the most crucial stages for which PMS is required.

PMS is not without its limitations which include the over-complicating of issues and sometimes being time consuming to employ. It was the researcher's opinion that the above limitations could also be due to the fact that there is limited training and refresher training offered to employees on PMS. In light of these limitations, it was revealed that a large percentage of the population would still be keen to try out the PMS at their organisations. The benefits they would be aiming to yield from employing new or additional PMS include time saving, and having improved transparency and accountability.

The main reason some were not keen on employing PMS in their work was that the scope of their work was too small to guarantee usage and employing PMS could be time consuming. The functionalities that were suggested in order to increase the uptake of PMS include that it should be modifiable to suit organisational needs, more simple to use, have less jargon and foster more connectedness and coordination.

4.6 Section C: Other Factors and Recommendations

The purpose of this section was to allow the organisations to give insight to the tools they use and how those assist them, as well as share any other details they felt pertinent to the study.

4.6.1 Other tools, techniques or standards used

Apart from PMS, there are a number of other tools, techniques and standards that are used in project management circles in order to attain project success. Schwalbe (2016:9) expresses that tools and techniques employed in an organisation can also be labelled as resources of an organisation and they must be optimally used also in the relevant processes of project management. Over the last two decades, we have seen some of the concepts of these tools be converted to PMS; for example, Ganttify, which was a modification of Gantt charts. The graph below shows the results of the tools, techniques or standards used besides the PMS.

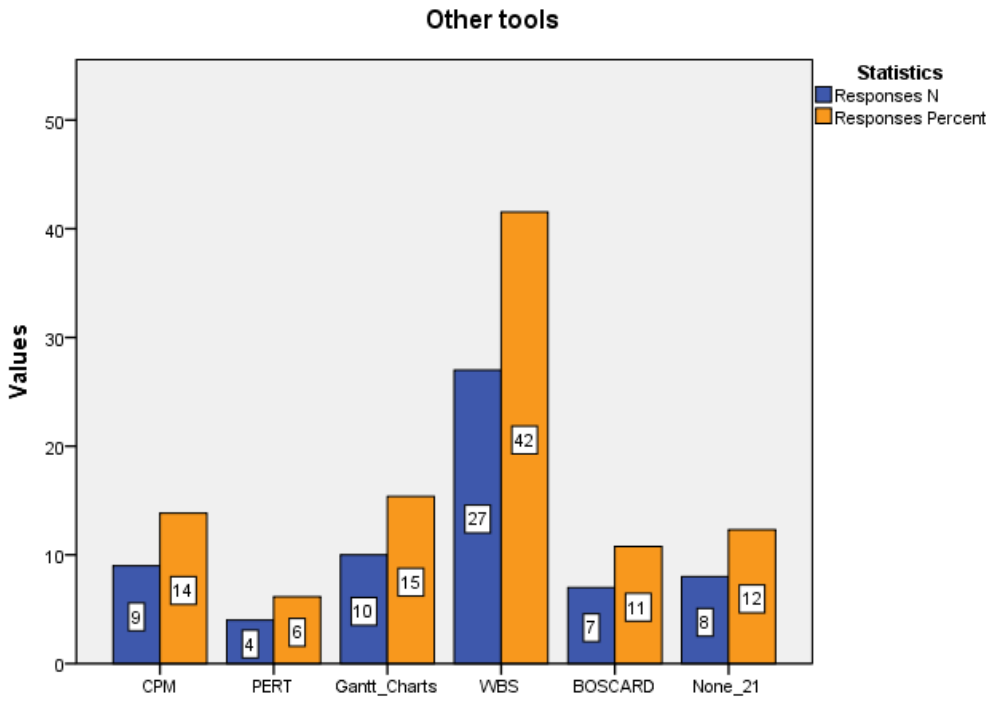

Figure 4.12: Other tools used

Work Breakdown Structure (WBS) was the most popular tool that was found to be utilised in the organisations. A point to note is that Gantt charts are also quite popular. This can be linked to our earlier findings which revealed that Ganttify was not yet as popular in the PMS realm; the current findings show that this may be because people still prefer to use the original Gantt charts. CPM and BOSCARD are also popular tools averaging at 10%. Of interest is that 12% of the respondents showed that they do not use anything to assist in their processes of project management.

4.6.2 Benefits of other tools

The findings above that reflect the usage of other tools, techniques and standards to acquire project success, show that there is benefit to utilising alternatives. The graph below shows the results of this inquiry.

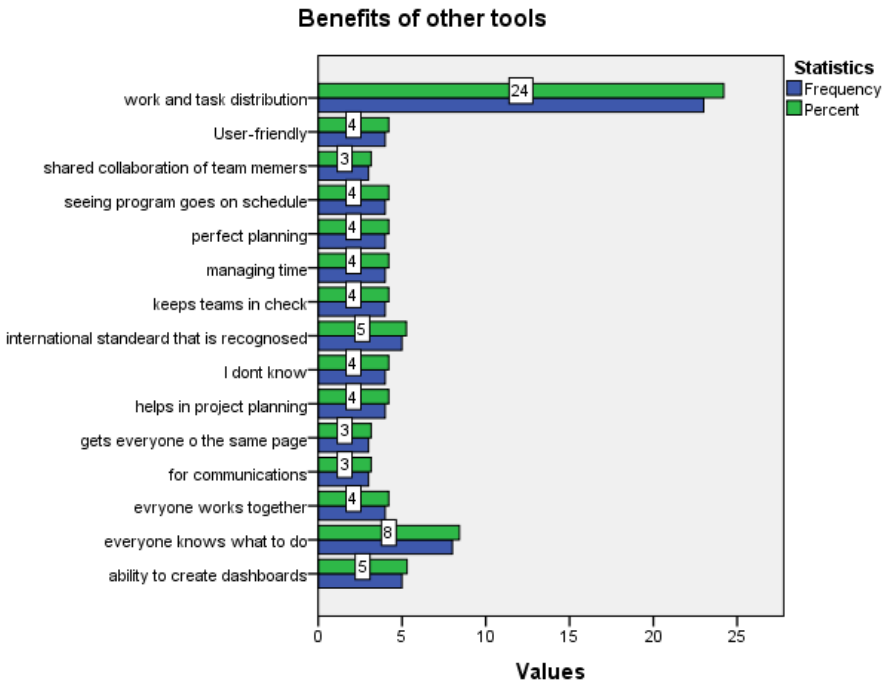

Figure 4.13: Benefits of other tools

Work and task distribution came out as the most popular benefit. This can be attributed to the fact that it is the main function of the WBS tool reflected in the previous question. As this was an open-ended question, a wide range of other benefits were also given about using the preceding tools, techniques and standards. These other benefits include management of time, communication, keeping teams in check, shared collaboration and user-friendliness.

Summary of Section C

WBS is the most popular tool used in the project management arena. Other popular options are Gantt Charts, the CPM and BOSCARD. There is a wide range of benefits to utilising other tools, techniques and standards. These include work and task distribution, management of time, communication, keeping teams in check, shared collaboration and user-friendliness.

4.7 Section D: Demographics

The purpose of this section was to gather the individual profiles of the project members answering the questionnaire. Details of occupation and level of education were used to evaluate the bearing on the implementation of PMS in the respective organisations.

4.7.1 Respondent's age

The purpose of this closed-ended question was to find out the respective ages of the respondents within NPOs with the goal to find out usage of the PMS was in any way affected by the ages of the project members within an organisation.

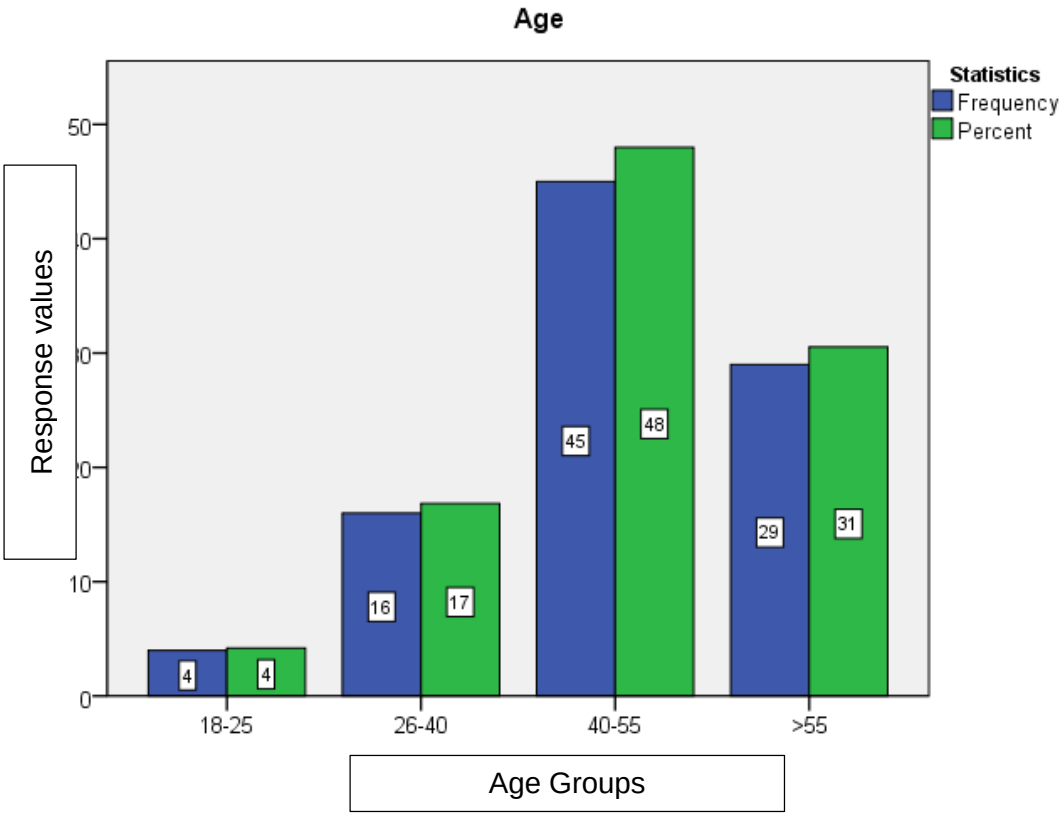

Figure 4.14: Respondent's age

The graph shows that the majority of people working in the NPOs are between the ages of 40 and 55; with the next popular group being aged above 55. This statistic can be substantiated by the fact that the NPO/ civic sector is often seen as the “for-good’ sector. With that in mind, there is a notion that some of the people get involved in it, having achieved great success in the private or public office and now looking to do social good (Kidwell, 2003:897).

Also of note was that the age group of 18 and 25 was the lowest among respondents. This is interesting especially as the millennials are generally deemed to be the most technologically adept age group (Deal, Altman & Rogelberg (2010:195). This would mean that they would have a positive impact on the uptake of technology in organisations they are employed in.

4.7.2 Respondent’s gender

The purpose of this closed-ended question was to find out the respective genders of the respondents within NPOs. Two mainline choices of male or female were provided as well as a third “prefer not to say” option for those who did not want to disclose this statistic. The results of this inquiry are shown below:

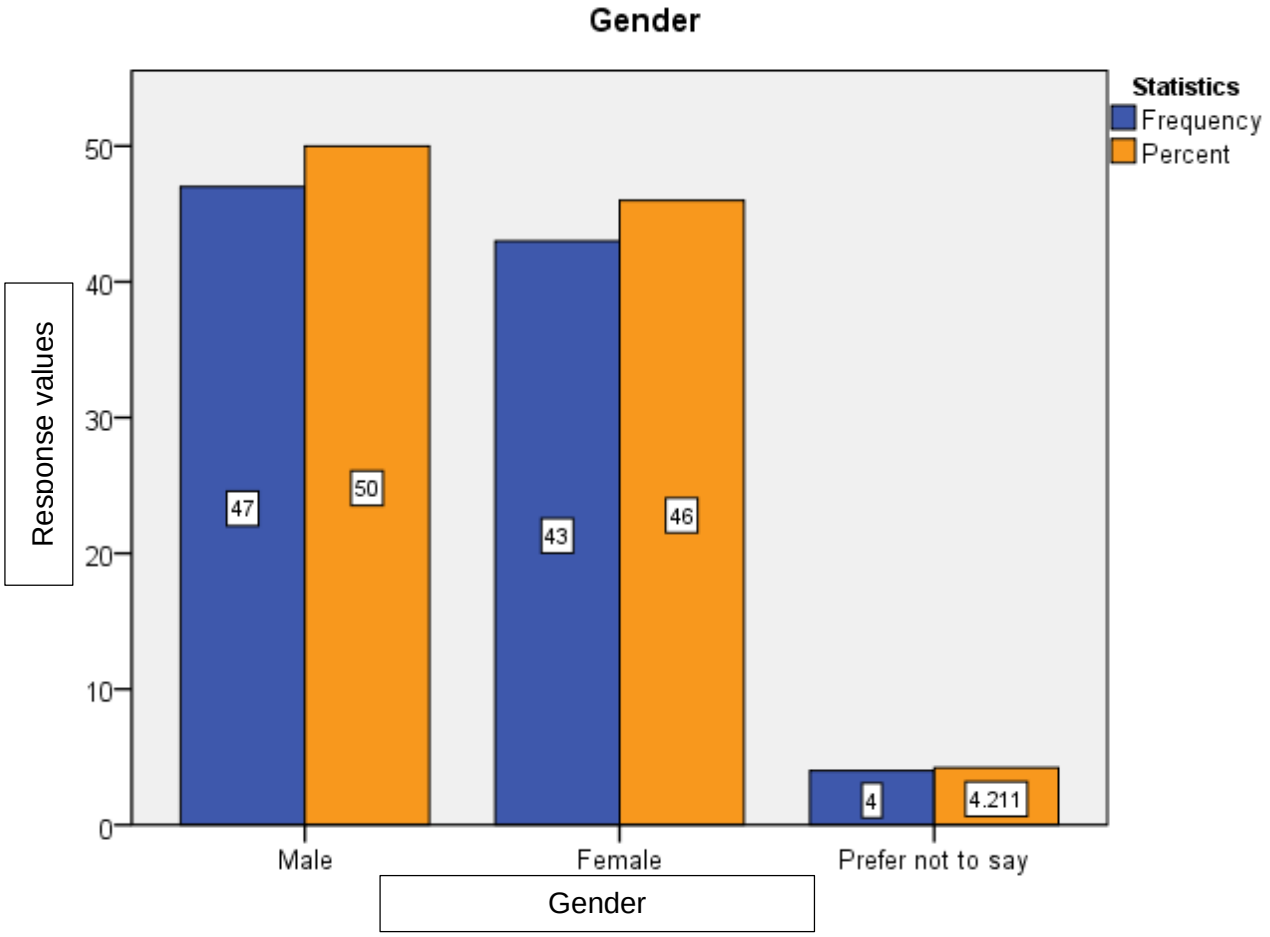

Figure 4.15: Respondent's gender

Most of the respondents were males; 47 representing 50%. A few participants preferred not disclosed their gender; 4 representing 4.2%. This shows an almost equilibrium in terms of the sexes employed in civic society. There 4 cases were the gender was not specified.

4.7.3 Completed education level

The purpose of this open-ended question was to find out the highest level of education completed by the respondents. The goal here was also to find out if the level of education of a respondent would have a bearing on their interactions with PMS. The graph below shows the statistics derived regarding the level of education attained by the respondents.

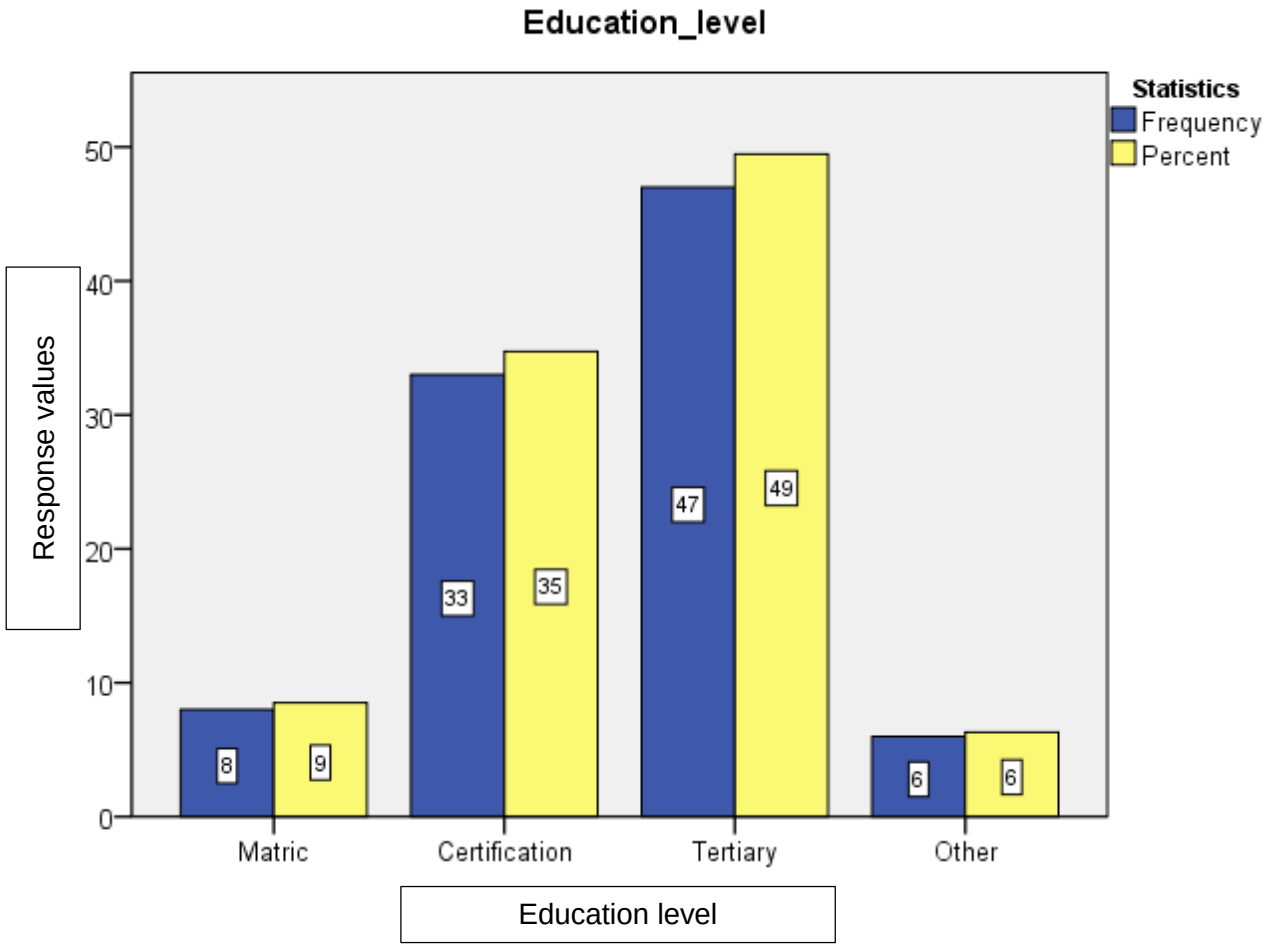

Figure 4.16: Education level

The graph shows that a substantial number of the respondents (49%) are graduates, meaning that they have a tertiary level qualification. The least number of respondents (9%) had attained a matric qualification. The median can be seen as the group with certification. Cumulatively, this shows that generally, the level of education is high for people in the NPO sector with most of the people having had at least 12 years of education. This statistic is great especially for those without the knowledge of PMS, in that it implies that the population has the basic level in which they can be introduced to ICT, if not familiar with it yet. Ultimately, they can they also be trained to use PMS if necessary.

4.7.4 Occupation

The purpose of this open-ended question was to find out the respondent's role within their respective organisations. The goal of this question was also to determine if there is a relationship between the different occupation bands and their interactions with PMS.

Figure 4.17: Occupation

The most popular occupation was found to be project managers who made up 29% of the population. This can be attributed to the fact that in a project set-up, one of the most crucial offices to hold is that of the project manager (El-Sabaa, 2001:6). The project manager is one of the senior members at the centre-point and can often times executes the roles of the other team members should they be absent. In smaller NPOs, the project manager can be responsible for the execution of the full lifecycle of the project. Next in popularity are the project technical persons as well as the ones occupied in the governance or compliance of the NPOs.

Summary of Section D

The majority of people working in the NPO sector are over 40 years old, while those between the ages of 18 and 25 populate the smallest group. There is almost an equal spread of men and women working in the civic society. The differentiator is a very small margin in favour of men. A substantial number of the respondents, 49%, are graduates while the least number recorded of 9% hold a matric qualification. The most popular occupations in project-implementing NPOs were found to be project managers, project technical persons as well governance/ compliance officials.

4.8 De-limitations of the Research

The researcher elected to conduct the study amongst NPOs in the Western Cape only. This geographical limitation leaves out other NPOs in other provinces of South Africa who may also have similar or different challenges. Their scenarios could bring a different angle to the research.

Seeing as the study was to explore the influence of PMS on project success, in hindsight, there could have been a control population group also studied to measure if the success rates would be different if PMS was not applied.

The researcher made use of only quantitative research in this study. Questionnaires only were used to capture data. This study could have potentially benefitted from a qualitative component. Using interviews, the researcher could have also unearthed other dynamics regarding the use of technology at the respective NPOs.

4.9 Conclusion

This chapter included the presentation and analysis of the findings from the administered questionnaires. The study was quantitative in nature and the findings were therefore presented graphically in the forms of tables and graphs and in written summary. Where relevant, the findings were analysed in relation to the research objectives and questions, and reference was made to the findings and work of other researchers whose findings were reviewed previously in the literature review chapter. Some of the findings included the below.

The average age of years that the NPOs have been in operation is 12 years. The exposure to projects that employees face varies widely with the highest number being 200 and the lowest being 3. Education and health projects are the most popular projects being implemented. Availability of funding and the alignment to organisational values are the main criteria used to select projects. Proper planning/ organising is viewed as the most important stage to focus on as it highly influences project success.

Acceptability by end-user and completion on budget are the most common identifiers of project success. The main challenges to project success are insufficient resources and inadequately defined requirements. The most commonly used PMS are Microsoft Project, Jira and Project Manager. Most users employ PMS on a weekly or monthly basis. Project execution/ implementation and project planning or organising are viewed as the most crucial stages for which PMS is required.

PMS is not without its limitations which include the over-complicating of issues and sometimes being time-consuming to employ. It was the researcher's opinion that the above limitations could also be due to the fact that there is limited training and refresher training offered to employees on PMS.

The main reason some were not keen on employing PMS in their work was that the scope of their work was too small to guarantee usage and employing the PMS could be time-consuming. The functionalities that were suggested in order to increase the uptake of PMS include that it should be modifiable to suit organisational needs, more simple to use, have less jargon and foster more connectedness and coordination.

The ensuing chapter will be titled conclusions and recommendations and these will be drawn from the findings of the current chapter.

CHAPTER FIVE
CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Electing this research was motivated by the fact that though strides have been taken to ensure the availability and application of technology, there still exists some disparity in the envisaged use compared to the actual use (Ross, Romich & Pena, 2016:48). Furthermore, the researcher learnt that the application of technology such as PMS could be the answer to unlocking success in projects especially where sometimes a large scope and high degree of complexity can prove to be very challenging.

The purpose of this research was therefore to explore how the application of PMS influences project success. A case of project-implementing NPOs in the Western Cape was used to address the research objectives and questions.

This chapter will firstly give a summary of the preceding chapters of this study. Thereafter, conclusions based on the data collection findings and in relation to the research objectives and questions will be presented. Finally, recommendations will be provided for further development work, academic research, policy making and NPO practice.

5.1.1 Sub-Objective 1

Establish if PMS is applied in the NPO's work.

This research objective went hand in hand with the research question, *"Which project management software are used within the NPOs?"*

The findings showed that a significant portion of respondents know and use PMS in their work. Microsoft Project was identified as the most popular PMS known. The least popular software packages among the NPOs were Ganttify and Smartsheet. As the list of PMS provided was not exhaustive, other respondents indicated that they used Asana, Scrum and Quire. Of particular interest is that almost 25% of the respondents reflected that they did not know any PMS.

The most commonly used PMS is Microsoft Project. This finding was similar to that on the PMS knowledge. Jira, Teamwork Projects and Project Manager were also quite popular with over 20% in usage.

As this inquiry was addressed by people who already knew PMS, it was interesting to note that a high percentage of them (almost 25%) do not use the PMS in their work albeit their knowledge. There were also some high variances to note between the knowledge of PMS and

the actual usage (Table 4.6: Variance of PMS known versus PMS used) was drawn to show the variances.

5.1.2 Sub-Objective 2

Determine employees' interactions with PMS relative to project success.

This research objective went hand in hand with two research questions of:

i. *What are employee's perceptions of the current software in use?*
ii. *What is the relationship between the use of the software and the success of the projects?*

The findings revealed that most project stakeholders use the software either weekly or monthly. On the other side, it was also noted that though some have used and do have PMS being applied at their organisations, at least 19% of this population rarely ever use it. This statistic on usage was attributed to the previous findings in Table 4.5: Challenges to project), that there may be resistance to change in the organisations or technology gaps that do not allow or promote the frequent use of the PMS.

Project planning/ organising and project execution/ implementation were determined to be the most crucial stage for which PMS is required at 31% and 28% respectively. At least 43% of the population showed that they would be keen to try it out new/ additional PMS while a further almost 37% were on the fence about potentially using the software. These could be swayed if the PMS would have encapsulated the added functionalities or benefits of saving time, simplicity, improved inter-connectedness and improving transparency and accountability.

A significant population maintained, however, that they would not be keen on PMS because their scope of work was too small to guarantee usage, while almost 30% revealed that using PMS was time consuming.

Using an opinion poll and with reference to the earlier findings regarding project success rates (Equation 4.1: Project success), 56% of the respondents revealed that they perceived a positive relationship between the use of PMS and project success in their organisation. A significant portion of people were on the fence regarding the impact of PMS. This may be attributed that there was no control to measure if the success rates would be different if PMS is not applied.

5.1.3 Sub-Objective 3

Identify the limitations of current PMS being used.

This research objective went hand in hand with the research question, *"What are the shortcomings of the current software?"*

The findings revealed that a majority expressed that PMS overcomplicates issues and can be time-consuming. This is the case especially when we note that NPO projects are often times smaller in size than those handled in the private or public sector. It is the researcher's opinion, however, that the above limitations could also be due to the fact that there is limited training and refresher training offered to employees on PMS. Therefore, without that buy-in from the employee, the use of PMS may seem tedious.

Other opinions that were expressed outside of the options given were that sometimes PMS is costly, has poor synchronising between devices, poor offline capabilities and is not adaptable to local contexts. It is again the researcher's opinion that this may be due to the absence of localised support in the cases of some of the PMS.

5.2 Scientific and Methodological Reflection

To a great extent, the research approach utilised, did not influence the findings of this study. This is firstly because all seven due research processes as described by Burgess (2001:1), were followed. Secondly, a mixed design of causal and predictiveness was employed, which enabled the researcher to address the research problem as unambiguously as possible. Through this process, the researcher was also able to transform the research problem into quantifiable formulations.

Thirdly, the approach endured validity of results as it satisfied the requirements listed by Bachman & Schutt (2007:225) which included empirical associations, appropriate time order and possibility of replication.

The scientific elements were satisfied in this non-experimental, quantitative study which made use of standardized questionnaires. The quantifiable data that was collected was hereafter analysed statistically to produce quantified and objective results. From a research population of 200, Sekaran's (2000:295) "prevalence sample size table" was utilised to determine the best sample size of 132.

Issues of reliability, validity and prevention of bias were addressed through passing the data collection instrument via peer and literature review, panel of specialists' review, as well as a pilot study prior to it being sent to the respondents.

Ethical considerations were also handled in that respondents were made fully aware that participation in the study was voluntary, all information shared would be treated with confidentiality, the necessary clearances and permissions had been sought and therefore their participation would only be through informed consent.

On the other hand, and to a lesser degree, the study was affected in that a mixed methodology with a touch of a qualitative approach would have enabled the collection of more data. Upon capturing data, the researcher observed that in some cases, there was missing data from unanswered or inappropriately answered questions.

This was highly likely because those respective respondents would not have clearly understood the question. This could have been resolved by the use of qualitative methods such as focus groups or interviews, where the researcher would be able to explain to the respondents' what exactly was required.

5.3 Recommendations

Based on the findings of this study, the researcher would like to pose the following recommendations to the following groups: South African Government, NPOs, software developers and engineers, and lastly academics.

5.3.1 Further Development Work – Software Developers/Engineers

A significant proportion of the population expressed interest in utilising new/ additional PMS. To note is that a significant proportion was on the fence on whether to utilise or not. In both instances exists a potential market that software developers and engineers can tap into. The researcher's recommendations are as follows:

i. Addition of functionalities

From the findings of the study, the NPOs voiced a number of functionalities that they would like to see added to the PMS. They also voiced limitations of the current software which the software developers can either improve on or add-on as new functionalities in existing or new PMS. The respective functionalities include:

- *Discussion boards*
  This will address the issue of time-consumption in that it will for example assist in cutting down confusing email chains and consolidating all team communication onto a single page.

- *User support*
  Need for intuitiveness and pro-active support to fix miscellaneous issues like occasional bugs.

ii. **Modification of existing tools**

Ganttify is a great example of PMS that was formulated from an existing tool, specifically the Gantt Charts. The findings in this study show that the most common tools utilised are the WBS and CPM. Useful components of these tools can then be modified to make new/ revised software.

5.3.2 Practice – NPOs and Civil Society

As "project-implementing" NPOs were the case under study, the researcher would like to recommend the following to be incorporated into their practices:

Encourage participation in project management capacity training for "project-implementing" NPOs

The researcher would like to recommend that NPOs start or continue to engage in trainings to capacitate themselves to be able to fully utilise the various arsenal available to manage projects. This will foster base-level knowledge of project management principles, systems and tools. NPOs would then be able to assess and select what is relevant for their respective organisations.

5.3.3 Further Research – Academia

There is scope for fellows in academia, particularly in the project management field to further this line of research:

i. **Geographically** – The current research location was the Western Cape. Future research could include the whole of South Africa. The outcomes of this research could then be used as the nascence baseline study to be compared with findings from outside this province.

ii. **Sector/ Industry** – The current research looked at a case of NPOs. Future research could look at the use of PMS in the private sector or in government.

5.3.4 Strategy – South African Government

While still maintaining their independence and autonomy, NPOs in South Africa are regulated (and sometimes funded) by the South African Government primarily through the Department of Social Development (DSD) and furthermore within the sectors in which they operate (Western Cape Government, 2009). As a regulatory and funding body, the researcher would like to present the following recommendations for incorporating into policy:

i. Registration of NPOs

- As the (Western Cape Government, 2018), ascribes there is a need to minimise red-tape in various government departments. This could include reducing the lengthy requirements required for NPOs to register.
- Upon registration, they will be able to access a host of opportunities and networks in order to boost their work, particularly in aid of projects. Once registered, government will also be better able to keep track of the respective NPOs and their work through the updated databases.

5.4 Dissertation Overview

This overview will provide a summary of the overall research, and is divided into the respective chapters into which the research was written.

5.4.1 Chapter 1 – Introduction

This chapter was conceptualised and informed by the research proposal which was peer reviewed to determine the soundness and academic prowess of the research. Included in the chapter are the background to the research problem, the purpose and significance of the research, the research objectives and questions, amongst others.

The background to the problem was that though some of the 'project-implementing' NPOs had realised laudable project successes in the past, there was still scope for improvement when it comes to project performance. The rise in ICT has brought about numerous systems (for example, PMS) and technologies that aid in the attainment of project success. Numerous strides have been taken to ensure the availability and application of that technology to most organisations. Currently however, it is unclear if NPOs make use of systems like PMS in the execution and management of their projects.

The aim of the study was therefore to determine the uptake of PMS in NPOs in the Western Cape and establish its influence on project success. It was identified that the study would be significant to software developers and engineers, NPOs, academia and the South African Government.

The key concepts for this study were project, project management, project management software, project success, and NPOs. The main objective of the study was to determine the uptake of PMS and establish its influence on project success. The sub-objectives extrapolated from the above were to:

1. Establish if PMS is applied in the NPO's work.
2. Determine employees' interactions with PMS relative to project success.
3. Identify the limitations of current PMS being used.

Flowing from the main and sub-objectives, the research questions were:

i. Which project management software packages are used within the NPOs?
ii. What are employees' perceptions of the current software in use?
iii. What is the relationship between the use of the software and the success of the projects?
iv. What are the shortcomings of the current software?

This chapter also introduced the agenda of the ensuing chapters that included the literature review and the research methodology that would be utilised to conduct the study and bring us the findings of the research.

5.4.2 Chapter 2 – Literature Review

The purpose of this chapter was to provide a comprehensive exploration, analysis and discussion of existing and relevant literature concerning the study topic. This review was guided by the keywords, research objectives and research questions which had already been defined in Chapter 1. The issues discussed herein included amongst others, project performance, types of software on the market and the NGO landscape in the Western Cape.

The literature review determined that due to the importance and contribution of projects to value addition in an organisation, it is pivotal to find ways in which projects can be implemented and managed in organisations. As alluded to by Wald et al. (2015:26), project success is very important for organisations as it has a direct link in the long-run to the innovation and business success of the very same entity.

Yang (2016:673) advised the importance of effective and repeatable systems and processes that promote the efficiency and effectiveness of projects. It was revealed that this could be through reliable ICT-based systems and tools that are designed to assist project teams, to meet the needs of customers while being efficient and maintainable. One such system is PMS.

PMS can be described as "software used for project planning, scheduling, resource allocation and change management" (Techopedia, 2016). This definition suggests that PMS can play a bilateral role of assisting with the project stages while ensuring that the respective success criteria are met. Some of the factors usually considered in the due diligence process of selecting PMS are ease of on-boarding/ use, scalability and user support. Examples of PMS include Microsoft Project, Trello, Smartsheet, Zoho, Project Manager and Jira, amongst others.

PMS is, however, not without its limitations which include that the advantages of the software are not remarkably visible for small projects as compared to the big projects, and that PMS and web applications are disruptive innovations that can be disruptive to the workflow lack of local context for project management activities and challenges.

To investigate this uptake of PMS, the researcher elected to do a case study of NPOs in the Western Cape. The Western Cape Government defines NPOs as trusts, companies or other association of persons who are established for a public purpose, based on common interest to take action on a particular subject or issue (Western Cape Government, 2009).

The researcher elected to focus on this group, firstly because there exists a constant need for NPOs to renovate and reinvent themselves in order to be fully capable to address the various social problems that South Africa faces. One way of doing this is to utilise the advantages that ICT offers into their work.

Secondly, though there has been ample study on the application of software in the spheres of the corporates, there remains a gap in the study of the same principle to NPO environments.

5.4.3 Chapter 3 – Research Methodology

The two focal points for this chapter were the research design and the research methodology. The design section gave insight of selecting the design that this quantitative study followed. In this section, issues of paradigms and empirical associations were discussed. The methodology, on the other hand, gave insight on the rationale used to select the techniques and tools used to collect the data.

Under this section, issues of research populations and locations, sampling strategies and sizes as well as tools for measurement were discussed (including the rationale followed in selecting them). Also included in this chapter were other commonly practised ethical considerations; for example, informed consent, clearances and permissions.

The researcher elected to utilise a mixed design of causal and predictive research. The study fit into these designs because it satisfied some of the conditions listed by Bachman & Schutt (2007:225) as being necessary for determining causality and predictiveness; these include empirical association, appropriate time order and possibility of replication.

On the methodology aspect, the researcher followed the non-experimental quantitative approach. The researcher employed this approach because it allows for the gathered quantifiable data, to be analysed statistically to produce quantified and objective results (Garbarino & Holland, 2009:13). Standardised questionnaires consisting of open-ended and closed-ended questions were used as the data collection instrument. The questions in the questionnaires were divided into four sections, namely:

A. **Organisation and Projects Profile** – this section was set to explore the organisational and project history of the organisations.

B. **PMS** – this section was set to investigate whether the NPOs are familiar and/ or make use of the PMS. It was also to see if they view PMS as an enabler to project in their organisations.

C. **Other factors and recommendations** – To allow the organisations to give insight to the tools they use and how those assist them, as well as share any other detail they feel like sharing.

D. **Demographics** – this section was set to determine the roles played by the various respondents in their respective organisations, their educational background and their occupational levels.

The study focussed on “project-implementing” NPOs in the Western Cape. In order to locate these NPOs, the researcher utilised the existing database available at the DSD and one from Sangonet, also known as NGOPulse—a reputable and premium organisation that specialises in providing support services to the NPO sector in South Africa. From this consolidation, the researcher came to a possible population of at least 200 NPOs in the Western Cape that are ‘project-implementing’ at the time of study.

Together with the statistician, the researcher utilised Sekaran’s “prevalence sample size table” to determine the best sample size. A sample size of 132 NPOs was determined for this quantitative study. A mixed sampling strategy of random convenience as well as snowballing was used.

The researcher ensured the validity, reliability and prevention of bias of the instrument through the following measures: a peer and literature review, panel of specialists’ review, and a pilot study.

The researcher also addressed the essential ethical concerns to be addressed when conducting research, namely: voluntary participation, informed consent, no risk or harm to the respondents, confidentiality, and anonymity. The pith of these issues were communicated to the respondents on the cover letter of the questionnaire.

Due to the manageable size of the study, the researcher conducted the fieldwork independently. Some of the questionnaires were distributed physically whereby the researcher physically visited the sites where the NPOs were based. Seeing as most NPOs have time constraints, the researcher elected to have an option available where questionnaires could be completed electronically via e-mails or via the online tool, Google Forms. The respondents constituted of project members of varying roles in the selected NPOs; for example, project support, project technical or project managers.

5.4.4 Chapter 4 – Data Findings and Analysis

The purpose of this chapter was to display and analyse the findings from the questionnaires that were administered. The study was quantitative in nature and the findings were therefore presented in the form of tables and graphs and briefly explained. Where relevant, the findings were analysed in relation to the key research objectives and questions and reference was made to the findings and other work of researchers whose findings were reviewed previously in chapter two.

Following receipt of data from the questionnaires that were completed and returned, the researcher proceeded to capture the data. The SPSS program was used to code and analyse the data. The findings were grouped into four sections as had been presented in the questionnaire and are as follows:

Section A: Organisation and projects history

The average period of existence for the interviewed NPOs was 12 years. NPOs vary widely in sizes (as measured according to the number of employees) with the most popular sizes being 10, 15, 16 and 60 employees. Most of the people have been employed in the same organisation for five years or less. The exposure to projects that employees had varied widely with the highest number being 200, and the lowest being three.

Education and health projects are the most popular projects being implemented. Availability of funding and the alignment to organisational values are the main criteria used to select projects. Proper planning/ organising is viewed as the most important stage to focus on as it highly influences project success. Acceptability by end-user and completion on budget are the most common identifiers of project success. The main challenges to project success are insufficient resources and inadequately defined requirements.

Section B: Uptake of PMS

The most commonly used PMS are Microsoft Project, Jira and Project Manager. Most users employ PMS on a weekly or monthly basis. Project execution/ implementation and project planning/ organising are viewed as the most crucial stages for which PMS is required.

The limitations of PMS include the overcomplicating of issues and sometimes being time-consuming to employ. In light of these limitations, a large percentage of the respondents would still be keen to try out the PMS at their organisations. The benefits they would be aiming to yield from employing new or additional PMS include saving time and having improved transparency and accountability.

The main reason some were not keen on employing PMS in their work was that the scope of their work was too small to guarantee usage and employing the PMS could be time-consuming. The functionalities that were suggested in order to increase the uptake of PMS include that it should be modifiable to suit organisational needs, more simple to use, have less jargon, and foster more connectedness and coordination.

Section C: Other factors and Recommendations

WBS is the most popular tool used in the project management field. Other popular options are Gantt charts, the CPM and BOSCARD. There is a wide range of other benefits to utilising other tools, techniques and standards. These include work and task distribution, management of time, communication, keeping teams in check, shared collaboration and user-friendliness.

Section D: Demographics

The majority of people working in the NPO sector are above the age of 40, while those between the ages of 18 – 25 years populate the smallest group. There is almost an equal spread of men and women working in civic society. The differentiator is a very small margin in favour of men. A substantial number of the respondents (49%) are graduates, while the least number recorded of 9% hold a matric qualification. The most popular occupations in project-implementing NPOs are project managers and project technical persons.

5.4.5 Chapter 5 – Conclusions and Recommendations

The final chapter of the research firstly gave an overview of the structure of the dissertation. Thereafter, conclusions were derived from the findings presented in the preceding chapter and juxtapositioned against the key research objectives and questions of the study. Based on this, the chapter ended with recommendations on the potential academic, policy, practice and development implications that could be pursued.

5.5 Conclusion

To sum-up, it can be resolved that the main objective of this research study, specifically, to determine the uptake of PMS and establish its influence on project success, has been effectively addressed. Hence, we can conclude that the uptake of PMS does have influence on project success.

Furthermore, based on the findings and conclusions derived from this study, the researcher has made recommendations that may benefit academia, software engineers/ developers, NPOs, the South African Government and ultimately, the people of South Africa.

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APPENDIX A: QUESTIONNAIRE

Dear Participant

You are invited to participate in a research study titled **"APPLICATION OF PROJECT MANAGEMENT SOFTWARE AND ITS INFLUENCE ON PROJECT SUCCESS: A CASE OF NPO'S IN THE WESTERN CAPE"**

This study is being conducted by Ms Silibaziso Nobukhosi Magwali under the supervision of Mr Stanley Fore from the Faculty of Business and Management Sciences at Cape Peninsula University of Technology (CPUT). The study has been approved by the Research and Ethics Committee of CPUT and no risk has been identified in participating in it.

Participation will be via questionnaire that can be completed online or on paper. The questionnaire will require approximately 10 – 15 minutes of your time to complete. Participation is voluntary and participants may omit questions they do not want to respond to.

While you will not experience any direct benefits from participation, information collected in this study may benefit the Information and Communication Technology sector by enabling them to better understand the uptake and user-experiences of software technology especially as it relates to the NPO sector.

If you have any questions regarding the questionnaire or this research project, please contact Ms Silibaziso Nobukhosi Magwali on 074 860 8598/ 210226951@cput.ac.za or her Supervisor, Mr Stanley Fore on 0214603516/fores@cput.ac.za.Your participation and valuable inputs would be greatly appreciated.

Yours faithfully

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Section A: Organisation and Projects History

1. For how long has the NPO been in existence?

   ……years

2. Size of the organisation (measured in number of employees)?

   ……employees

3. Years in current employ:

   ……years

4. How many projects have you been involved in since being employed?

   ……projects

5. What type of projects have you been involved in? *(tick all that apply)*
   ☐ Infrastructure and Capital development ☐ Justice and Legal
   ☐ Information and Communications Technology ☐ Education
   ☐ Agricultural and Environment ☐ Health
   ☐ Other –specify ……

6. What is the selection criteria for the projects you embark on? *(tick all that apply)*
   ☐ Availability of funding ☐ Financial benefit
   ☐ Alignment to organizational values ☐ Stakeholder relationships
   ☐ Technical risk and feasibility ☐ Team's skills and competencies
   ☐ Other –specify ……

7. What do you consider to be project **success**?
   (tick all that apply)

   ☐ Completion on time ☐ Delivering high quality outcomes
   ☐ Acceptance by end-user ☐ Usability by end-user
   ☐ Completion within budget
   ☐ Other – please specify……

8. How many **successful** projects have you been involved in since being employed?

   ……projects

9. In your opinion, which project stage most affects project success in your organisation? *(tick all that apply)*

☐ Project Initiation/ Conception ☐ Project Planning/ Organising
☐ Project Execution/ Implementation ☐ Project Control/ Performance
☐ Project Closure
☐ Other – please specify……

10. What challenges do you face in attaining project success? *(tick all that apply)*

☐ Resistance to change ☐ Inadequately defined requirements
☐ Insufficient Resources ☐ Technology gap
☐ Poor Communication
☐ Other – please specify……

Section B: Uptake of Project Management Software at the NPO

11. Which of the following Project Management Software do you know? *(tick all that apply)*

☐ Microsoft Project ☐ Smartsheet ☐ Project Manager
☐ Primavera ☐ Liquid Planner ☐ Ganttify
☐ Teamwork Projects ☐ Jira ☐ Zoho
☐ None
☐ Other –specify ……

NB: If response to question 11 is "None", kindly skip to Question 16

12. Which of the following Project Management Software have you used before at the current organisation? *(tick all that apply)*

☐ Microsoft Project ☐ Smartsheet ☐ Project Manager
☐ Primavera ☐ Liquid Planner ☐ Ganttify
☐ Teamwork Projects ☐ Jira ☐ Zoho
☐ Other –specify ……
☐ If none, specify why not ……

13. How often do you use the Project Management Software in your work?

☐ Daily ☐ Weekly ☐ Fortnightly
☐ Monthly ☐ When need arises ☐ Never

14. For which project stages is the software/s beneficial?
(tick all that apply)

☐ Project Initiation/ Conception ☐ Project Planning/ Organising
☐ Project Execution/ Implementation ☐ Project Control/ Performance
☐ Project Closure
☐ Other – please specify……

15. What are the limitations of the Project Management Software?
(tick all that apply)

☐ Unfriendly interface ☐ Poor quality ☐ Over-complicates issues
☐ Poor support service ☐ Time-consuming
☐ Other – specify ……

16. Would you consider using new/additional project management software?
☐Yes ☐ No ☐ Maybe

17. If yes, which of the following reasons best motivate why you would want the project management software?
(tick all that apply)

☐ Save time ☐ Better teamwork ☐ Save cost
☐ Risk management ☐ Transparency ☐ Accountability
☐ Other –specify ……

18. If no to question 16, which are the following reasons best describe why you would not want project management software?
(tick all that apply)

☐ I do not understand it ☐ Its time consuming to use them
☐ Its too complex ☐ Scope of projects is too small to warrantee use
☐ Other –specify ……

19. What functionalities would you like to see added to Project Management Software in order for it to contribute more towards the success of your projects?

……
……

……
……

20. Do you see a relationship between the use of Project Management Software and Project Success in your organisation?
☐Yes ☐ No ☐ Maybe

Section C: Other factors and recommendations

21. Besides the Project Management Software, what other tools, techniques or standards have you found beneficial in ensuring project success?
(tick all that apply)

☐ Critical Path Method (CPM) ☐ Program Evaluation Review Technique (PERT)

☐ Gantt Charts ☐ Work Breakdown Structure (WBS)
☐ BOSCARD ☐ None
☐ Other – please specify……

22. If not "none", describe the benefits of using the selected tools?

……
……

……
……

23. Any other comments/ recommendations regarding the study?

……
……

……
……

Section D: Demographic Profile

24. Age ☐18 – 25 ☐ 26 – 40 ☐ 40 – 55 ☐ >55

25. Gender ☐ Male ☐ Female ☐ Prefer not to say

26. Highest completed level of education
☐ Matric ☐ Certification ☐ Tertiary
☐Other – specify……

27. Occupation:
☐ Project Support ☐ Project Technical ☐ Project Manager
☐ Governance/compliance ☐ Board member/Trustee ☐ Other

Thank you for participating in this study!

APPENDIX B: ETHICAL CLEARANCE CERTIFICATE

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

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

At a meeting of the Faculty's Research Ethics Committee on **19 June 2018**, Ethics **APPROVAL** was granted to **SILIBAZISO NOBUKHOSI MAGWALI (210226951)** for research activities of **MTECH: BUSINESS ADMINISTRATION IN PROJECT MANAGEMENT** at Cape Peninsula University of Technology.

Title of dissertation/thesis/project:	APPLICATION OF PROJECT MANAGEMENT SOFTWARE AND ITS INFLUENCE ON PROJECT PERFOMANCE: A CASE OF AN NPO IN THE WESTERN CAPE Lead Researcher/Supervisor: Mr. S Fore

Comments:

Decision: APPROVED

Signed: Chairperson: Research Ethics Committee	**23 July 2018** **Date**

Clearance Certificate No | 2018FBREC555

APPENDIX C: PERMISSION LETTER

THE HEALTH FOUNDATION
WESTERN CAPE

Together towards wellness

Research and Ethics Committee
Cape Peninsula University of Technology
PO Box 652
Cape Town
8000

1 June 2018

To whom it may concern

APPROVAL FOR MS SN MAGWALI TO CONDUCT RESEARCH AT THE HEALTH FOUNDATION

On behalf of the organisation, I would like to indicate awareness of the research proposed by Ms Silibaziso Nobukhosi Magwali titled '**Application of project management software and its influence on project success: a case of NPO's in the Western Cape**'.

I am further aware that she intends to conduct her academic research by administering questionnaires.

This serves to confirm that permission is hereby granted for her to conduct the above research at our organisation. It is imperative that all engagements with us be planned aforehand in order to allow for sufficient response times.

Yours faithfully

Mr Harry FJ Grainger
General Manager
The Western Cape Health Foundation NPC

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APPENDIX D: PROFESSIONAL EDITING CERTIFICATE

Kingdom Editing

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takutau@gmail.com
079 636 8353

Declaration of Professional Editorial Assistance for MTech Thesis

Professional editorial work undertaken in the preparation of this thesis has been done according to the Cape Peninsula University of Technology's (CPUT) guidelines.

Professional editorial intervention was restricted to: proof reading, CPUT formatting, grammar, spelling, punctuation and clarity of meaning.

The professional editor provided advice on grammar and structure; gave examples only and did not undertake a structural re-write themselves.

Material for editing or proofreading was submitted in hard copy, or where an electronic copy was submitted to the editor, their mark-up was done using Track Changes.

Candidate's Name: Silibaziso Nobukhosi Magwali

Thesis title: Application of Project Management Software and its Influence on Project Success: A Case of NPOs in the Western Cape

Editor's Name: Takudzwa Musiyarira

I declare that I have edited/proofread this thesis in compliance with the above conditions, as requested by the candidate.

The documents submitted by the student for proofreading or editing purposes remain the sole and exclusive intellectual property of the student.

Signed: ..... Date: 21/11/2018

Professional Editors' Guild