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THE IMPACT OF A PROJECT MANAGEMENT STYLE ON PROJECT TEAM PERFORMANCE IN AN ELECTRICAL ENGINEERING MANUFACTURING INDUSTRY.

By

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DECLARATION

I, Eric Anonchu, declare that the contents of this dissertation/thesis represent my own unaided work, and that the dissertation 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.

Signature

5th December 2022

Date

ABSTRACT

Project management style is a concept which is put into operation by individuals in their personal and professional lives. In order to implement this concept in an effective and worthwhile manner, the individuals need to acquire an understanding in terms of meaning and significance of project management.

When a project manager understands the meaning, and how the project management concept will prove to be useful to them in carrying out their duties well and achieve the desired goals, they will put it into operation. Project managers have the main objective of providing knowledge, support and assistance to their subordinates in carrying out their duties in a well-ordered and regimented manner and achieving the desired goals and objectives. When project managers are performing their duties or are working with other individuals, they need to inculcate the traits of morality and ethics that lead to goodwill and well-being.

Furthermore, project managers need to be well-aware in terms of measures and approaches to cope with changes and ensure that they prove to be efficacious, and useful to the project team members as well as the organization as a whole. Therefore, it can be stated, the project managers and senior managers need to acquire an efficient understand of project management concept, before they perform their responsibilities and functions. The main areas that are highlighted in this research dissertation are project management style and their effect on project team performance in electrical engineering industries, functions of leadership, types of leadership, and roles of the leaders.

KEYWORDS; Project, project team, subordinates, hard-skilled personnel, soft skills, and team effectiveness.

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DEDICATION

This thesis is dedicated to

My beloved parents

Mrs Anonchuh Martha Wonjik and late Mr Anonchuh Paul Awa

My lovely children

Felix-Ryan Awa Anonchuh and Nathaniel Achu Anonchuh

And my loving Wife

Dr Miranda Mengwi Ndipingwi

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CHAPTER 1
INTRODUCTION

1.1 Preamble

The success of project management in the twenty-first century has been linked to achieving the critical confluence of the triangulation of cost, time, and quality, with little or no attention paid to the project manager's style in completing projects. According to Herman Steyn (2016:245-248), many projects in South Africa, such as Eskom Medupi and Kusile power stations, have overrun their original budget and missed their completion deadline due to a lack of leadership, planning, poor communication, and poor stakeholder management. In a project, meeting customer specifications with the allocated budget while keeping all stakeholders satisfied are characteristics of good project management (Larson & Clifford 2014:356).

In developing countries like South Africa, where increased competition has led to many companies using projects as a mandate, requires the creation of a much closer relationship between the provider and the receiver (Larson & Clifford 2014:14). The development of project management styles are interventions for enhancing competitive advantage and fast track economic growth to create jobs and attract investment (Herman Steyn 2016:56-64).

Gewanla & Bekker (2015:34) cite Lawless (2007) as stating that, since the mid-1990s, the South African electrical engineering industry has experienced a significant loss of qualified and experienced project managers to other nations, other economic sectors, and retirement. He added that this has resulted in a lack of experienced and skilled project managers despite the South African government's high infrastructure development plan to stimulate economic growth. According to Gewanla & Bekker (2015:35), the shortage of qualified, experienced project managers has forced industries to hire young and inexperienced project managers to manage large and often complex projects. In addition, Yang, as cited by Eyiah-Botwe, Aigbavboa & Thwala (2015:1297), states that the shortage of project managers also resulted in young project managers being overloaded with work. All these can lead to poor project management and project failure.

1.2 Background to Study

1.2.1 Introduction

According to the Oxford dictionary, a literature review is an effective evaluation of selected documents to form a review of the literature that forms an essential part of the research process. Jowah (2011:47) posits that literature review references previous work done by other scholars, researchers, and other sources relevant to the study to be pursued. This section will discuss key effective and efficient project management styles and their effect on team performance and project success. The theory in this section shall help the researcher achieve the objectives of this research project. The importance and impact of these project management styles and their effect on project success shall be highlighted.

1.2.2 A Practitioner's Guide to Establishing and Managing a Project Managing Office at Electrical Engineering Industries

According to Malatji & Marnewick 2016:299, the fundamental purpose of embarking upon projects is to achieve strategic objectives that could not otherwise be accomplished through a functional unit or department. An increase in the use of projects in the electrical engineering industries is to achieve strategic objectives in today's business environment, and it requires a standardised approach to project execution (Malatji et al. 2016:210)

System evolution Inc as cited by Malatji et al. 2016:299 state that most electrical engineering industries face challenges, especially with inadequate project management (PM) tools and technique to deliver a single strategic project successfully, and yet most organisation attempt to implement a portfolio of projects without a robust PM framework from which to function. To achieve such a robust framework, Unger, Gemunden & Aubry (2012:608) argue that the project management office (PMO) has emerged as a key solution to be utilised for the coordination and management of multiple projects. Allocating a name to such an organisational PM function, such as a PMO, gives it significance and differentiates it from other functions within the organisation (Bolles & Hubbard 2015:6). Zohrevandi, as cited by Malatji et al. (2016:299), views the role of the PMO as that of aligning the various departments within an organisation with each other to ensure synergy and reduce the duplication of effort.

Malatji et al. (2016:299) argue that, in practice, it is unlikely that any PMO, in its first attempt at establishment, will render a complete suite of services. Therefore, research by Pinto, De

Matheus, Marcelo & Levin (2010:6) was conducted to identify typical PMO maturity models to help establish, to some extent, the appropriate PMO configuration types suited to render certain services. As shown in Figure 1, the PMO service maturity stage indicates the PM capabilities of a PMO within an organisation (Hill, as cited by Malatji et al., 2016:300).

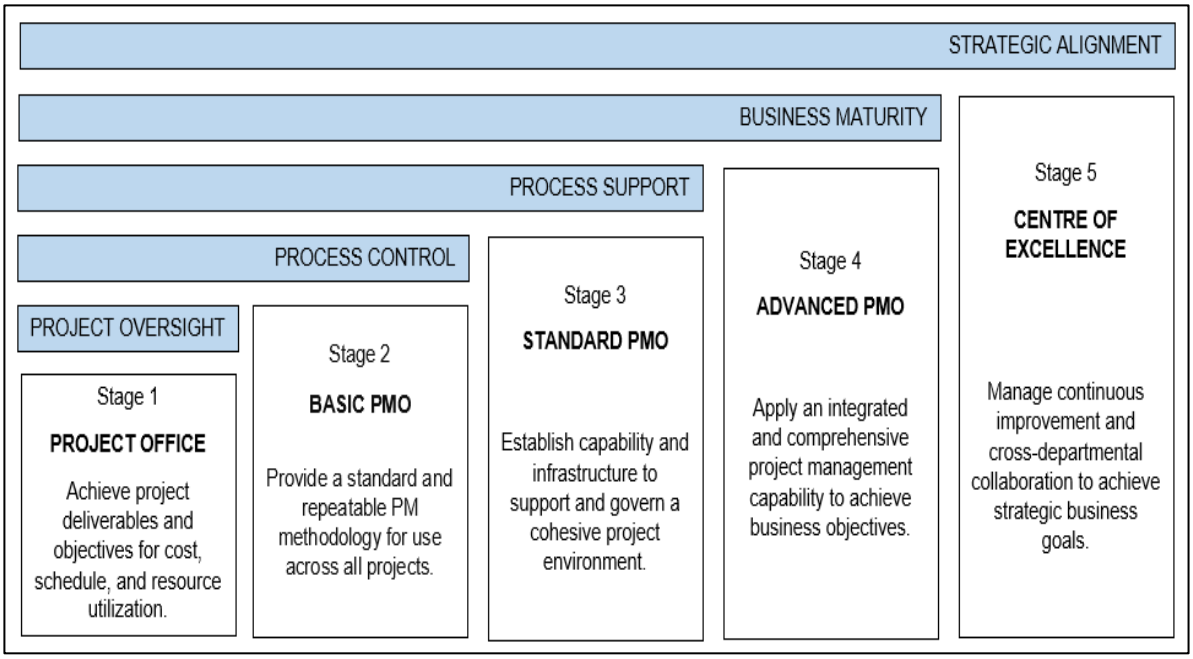


Figure 1.1: Overview of PMO Service Maturity Levels

Source: Hill as cited by Malatji (2016:300)

Pinto et al. (2010:6) take a different approach in presenting their perspective on the PMO service capability maturity model. As seen in Figure 2, the level of maturity progresses from a basic to a more advanced PMO, with the services rendered also changing from operational and tactical to more advanced and strategic services. Hill, as cited by Malatji (2016:300), states that a comparison of the two PMO service maturity models in Figures 1 and 2 indicate similarities in that a project office at basic level of maturity renders basic PM operational services. However, Pinto et al. (2010:6) noted that the enterprise wide PMO is at an advanced maturity level and renders strategic services.

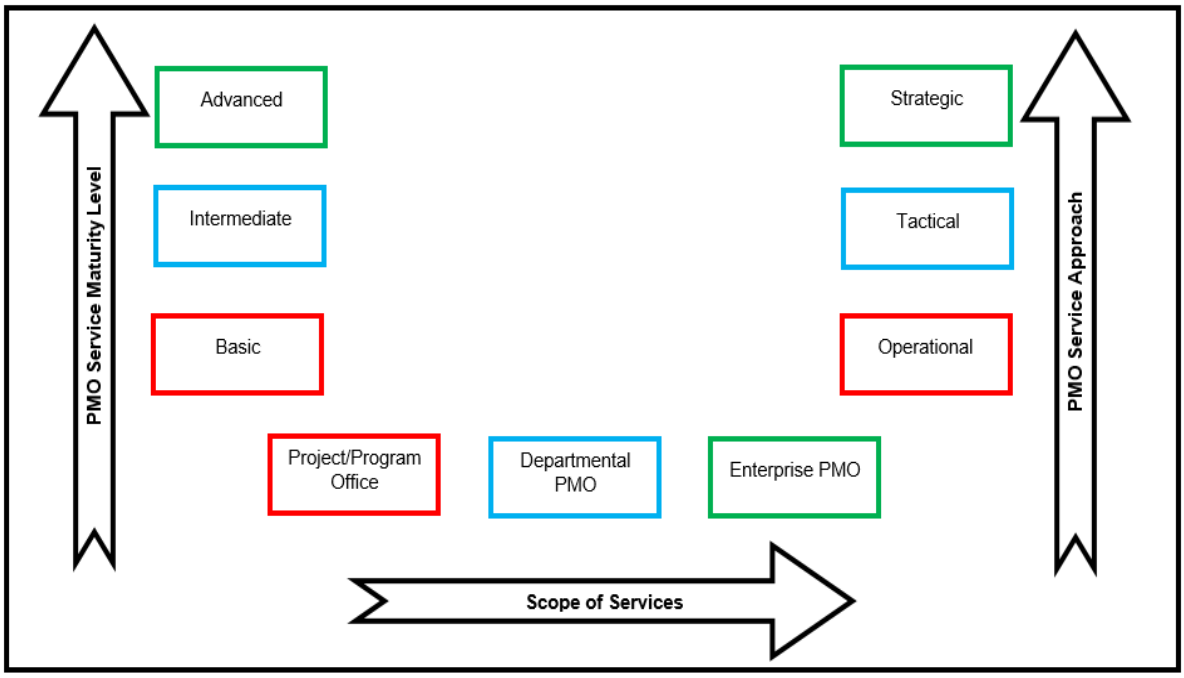


Figure 1.2: PMO Service Maturity Model

Source: Pinto et al. (2010:6)

It is important to note that, according to PMI (2012:2), an estimated half of the PMOs fail on their first attempt at establishment for various reasons, including not aligning themselves to the strategic organisational objectives.

1.2.3 Categorising Project Manager Attributes that Lead to Project Success

Schultz, Slevin & Pinto, as cited by Gewanlal & Bekker (2015: 36), created two broad categories, namely 'strategic' and 'tactical' requirements needed by project managers to achieve project success. Bellasi & Tukel, as cited by Gewanlal et al. (2015: 36), postulate that there are five categories of success factors: project-related factors, project manager factors, project team member factors, corporate organisation factors, and external factors. Ahadzie, Proverbs & Olomolaiye (2007: 684-687) found four clusters of criteria of project success factors, namely 'project environment', 'customer interaction and satisfaction', 'product quality', and 'value and time'. Crawford (2005: 12) argues that competence could be inferred from attributes, which included knowledge, skills and experience, personality traits, attitudes, and behaviours.

Gewanlal et al. (2015: 36) review the above literature and the specific characteristics in the categories defined by the cited authors regarding Crawford's findings (2005: 12-15). The following six classes of project manager characteristics are described: interpersonal factors, application of theory, personal character factors, personal contribution factors, personal skills, and practical application. Each category is further divided into six factors, as explained in Table 1 below (Gewanlal et al. 2015: 36-37).

Table 1.1: Categories for project management attributes

Category 1 *– Interpersonal factors (characteristics relating to the interaction of PMs with their team members)*	
1a	Supervision of project team
1b	Ability to delegate authority
1c	Ability to motivate team members
1d	Sense of teamwork
1e	Stakeholder management (parent organisation)
1f	Stakeholder management (client)
Category 2 *– Application of theory (controlling and evaluation instruments, industry-specific and appropriate qualifications and the concomitant institution of theoretical planning)*	
2a	Professional qualifications
2b	Monitoring and controlling (time)
2c	Planning (integrative)
2d	Monitoring and controlling (integrative)
2e	Monitoring and controlling (cost)
2f	Planning (time)

Category 3 *– Personal character (individual motivation and personality traits)*	
3a	Leadership style
3b	Emotional intelligence
3c	Results orientation
3d	Energy and initiative
3e	Self-confidence
3f	Optimism
Category 4 *– Personal contribution (management actions taken to achieve project success)*	
4a	Ability to determine cost/time trade-offs
4b	Level of involvement in the project
4c	Ability to determine quality/time trade-offs
4d	Ability to establish an appropriate organisational structure
4e	Commitment to meet cos/time and quality constraints
4f	Desire to achieve success and recognition

Category 5 *– Personal skills (managerial skills to apply to projects)*	
5a	Communication skills
5b	Technical skills
5c	Organising skills
5d	Coordinating skills
5e	Negotiating skills
5f	Decision-making and problem-solving skills
Category 6 *– Practical application (practices to implement during projects)*	
6a	Ability to implement an effective safety programmed
6b	Ability to implement an effective quality assurance programmed
6c	Relevant work experience
6d	Control of subcontractors' work
6e	Adaptability to changes in the project plan
6f	Define and follow strategic direction

Source: Gewanlal et al. (2015: 36-37)

Table 1.1 enumerated and summarised list of all characteristics can be argued to be significant. Nevertheless, some characteristics may be more significant than others or more applicable in certain types of projects than others. Finding the "ideal" project manager continues to be difficult, but guidance in selecting the best project management candidate should help improve the likelihood of project success (Gewanlal et al. 2015: 37-38). Based on the above attributes identified, a questionnaire shall be designed and distributed to potential project managers in electrical engineering industries in Cape Town to identify the most important project management styles required by project managers to ensure project success.

1.2.4 Factors Influencing Project Manager Performance in the Industry

In various research outputs, Belassi & Tukel, as cited by Gewanlal et al. (2015: 35), discovered considerable variation between project types and industries. Research by Baloyi & Bekker (2011: 62) examined what caused the cost overruns and project delays in developing and constructing the South African 2010 FIFA World Cup Stadiums. Lack of skilled labour was one of the most significant causes of cost overruns from the contractor's perspective. Most projects in industries today are faced with project delays; the major contributing factors are, as with the stadiums, the dearth of skilled labour, inadequate planning and scheduling, exacerbated by unrest in. labour manifested in the periodic and seemingly-ongoing strikes.

Ahadzie, Proverbs & Olomolaiye, as cited by Gewanlal et al. (2015: 36), investigated the critical success criteria for building projects in electrical engineering industries and concluded that the "current and future success of an enterprise is a reflection of the effectiveness of the senior team, their vision and leadership, and the combined knowledge and skills of the organisation's workforce". Project leadership style and supervision featured as key factors in the research conducted by Odusami, cited by Gewanlal et al. (2015: 35) on engineering projects. This study examined the influence of a team leader's professional qualifications, profession, leadership style, and project team composition on the success of projects. According to the findings, the project manager's qualifications substantially impacted the project's performance. This signifies that project manager qualification can influence their management style and lead to project success. Muller & Turner (2007: 22-24) investigated the relationship between the project manager's leadership style and the project type and the effect of these two variables on the project's overall success. The leadership styles of project managers were modelled in terms of intellectual, emotional, and

managerial characteristics, style competence and compared to the success of their most recent projects. Seven traits of effective project manager's styles were identified: problem-solving ability; results orientation; energy and initiative; self-confidence; perspective; communication, and the ability to negotiate.

Chua, Kog & Loh, as cited by Gewanlal et al. (2015: 36), listed ten critical success factors for engineering projects. Apart from technical requirements, the list also included project manager attributes such as competency, commitment, and level of involvement. As cited by Gewanlal et al. (2015: 36), Crawford researched the qualifications of a capable project manager. She presented an analysis of research-based literature concerning the criteria by which project success is determined, the factors that contribute to the success of projects, and the project manager's knowledge, skills, and personal characteristics expected to lead to the successful completion of projects. In a follow-up study, Crawford examined senior management's perceptions of project managers' competence. The findings indicated that project managers and their supervisors or senior management have different perceptions and expectations of project management competence. Crawford, as cited by Gewanlal et al. (2015: 36), defined competence as "an underlying characteristic that is causally related to criterion-referenced effective and superior performance in a job or situation".

1.2.5 Project Risk Management

The project management body of knowledge (PMBOK) defines project risk as uncertainty that can negatively or positively affect meeting project objectives (Project Management Institute 2008:275). The International Organization for Standards, in its ISO31000 risk management standard, defines risk as the "effect of uncertainty on objectives" (Mnkandla, 2012:280). Hillson, cited by Mnkandla (2012:280), argues that whilst the ISO definition for risk seems clear and unambiguous, with just five words, the focus of the definition is on 'effect' instead of 'uncertainty', which is the traditional focus of the definition of risk. Hillson further argues that managing effect would be somewhat different from managing uncertainty, yet risk is about managing uncertainty.

There are many issues surrounding project risk management, such as the apparent failure of many organisations to implement risk planning, monitoring and control. This was reflected in various surveys such as Ibbs & Kwak, as cited by Mnkandla (2012:281), in which project management maturity was assessed. The results showed, among other things, the fact that project risk management was the least implemented knowledge area. Such implications are because carrying out project risk management does not necessarily have any visible

artefacts, and yet the lack of project risk management will undoubtedly negatively affect the success of a project if the risk does occur (Mnkandla 2012:284-286).

Project risk management involves the planning, monitoring, and controlling of risks in a project. During project planning, risk management involves developing project risk plans, identifying risks, performing qualitative and quantitative risk analysis and determining how to respond to risks (Project Management Institute 2008:53). As the project progresses, risks will need monitoring to implement contingency plans either when the triggers for the risks occur, or the risks themselves occur (PMI 2010:34-35). From a security perspective, risk differs from a threat and a vulnerability; however, in most systems development project literature, all these terms are included under risk.

In terms of security, a threat would be anything that can take advantage of a weakness in the system intentionally or by accident to obtain, damage, or destroy what the system is trying to protect (Larson & Clifford, 2014:208-209). A threat is, therefore, that entity against which the system is trying to protect. On the other hand, a vulnerability would be a weakness or gap in a system that can be exploited by threats to affect the project negatively. Hence risk is the potential for loss, damage, or destruction of a project due to a threat exploiting a vulnerability (PMI, 2008:54). When applying this whole concept to the management of projects, it becomes inevitable to identify the source or root cause of a risk. Risks occur when a threat which could be internal or external to the project processes, successfully exploits a vulnerability within the project processes; hence risks can be better managed by dealing with their root causes, i.e., vulnerabilities in the project processes or threats to the project processes (Mnkandla, 2012:281).

1.2.6 Project Risk Analysis Techniques

Projects may seem to be inundated with inherent risks, but there are strong indications that with considerable care, these risks can be successfully controlled (Raz, Shenhar & Dvir, as cited by Mnkandla 2012:282). This section looks at some of the techniques available for analysing project risk. Jantzen, Adens and Armstrong, as cited by Mnkandla (2012:282), advocate for a cost and schedule balanced approach in estimating risk for project development. They warn against being overly optimistic (assuming no risk will occur) or overly pessimistic (assuming that all risks will occur). The limitation of their approach is the focus on only two knowledge areas, i.e., cost and time, and yet risk in projects can emanate from any knowledge area.

DeMarco and Lister, as cited by Mnkandla (2012:282), agree that greater risk brings greater reward, particularly for new development projects. In their experience, a business that shies away from risk will quickly fall behind its more daring competitors. Project managers drive their organisations into the ground by disregarding the possibility of adverse outcomes in the name of optimism or a gung-ho attitude. They believe that the only reason people do project risk management is not to avoid risks but to enable aggressive risk-taking. DeMarco and Lister, as cited by Mnkandla (2012:282), recommend an early start to new projects as a sure way to mitigate schedule-related risks, and their technique is to identify the most common risks for new projects, such as schedule flaws, requirements inflation, turnover, specification breakdown and under-performance.

Kwak and Stoddard, as cited by Mnkandla (2012:282), recommend implementing formal risk management processes to manage complex issues associated with new development projects. However, their research revealed that organisations face challenges in integrating processes into the organisations due to the disparity between the theoretical nature of risk management processes and the practical challenges of organisations.

1.2.7 A Comprehensive Risk Identification Technique

Comprehensive identification of project development risks improves the rates of success of such projects (Koopman 2010:3). The use of techniques that integrate risk management during the requirement engineering phase has been investigated by Islam (2009:6). Ma, Liu, Feng, Shan and Peng (2009:8) present a detailed analysis of risks in projects using a model that is based on the social context of projects development. They use Hofstede's national culture index and Chinese culture as an example to explain how cultural factors impact project risk management.

Hillson (2011:20) tackles the topic of risk management from the perspective of failure. He shows that the fear of failure, when taken to extremes, can lead to overprotectiveness which could prevent organisations from taking necessary risks or pursuing profitable opportunities in the fear that things could go wrong. Murrah (2012:5) presents a formal risk assessment model that can be applied to project development in the early stages of the project development life cycle. The model has been validated against thousands of post-mortem projects, with applicability to any project development activity (Murrah 2012:8). Hillson (2010:8) maintains that the key to applying structured risk management is to remember that no matter how complex and uncertain things may seem in projects, risk management works.

Running through the various techniques for project risk management, a general theme emerges that starts from identifying risks, prioritising risks down to formulating the aversion strategy and finally monitoring the risks. What is clear from the literature is that there is a general concern for managing risks in project development, but a comprehensive approach to incorporating risk management in project development methodologies is lacking. To bring risk management closer to what project development teams and their project managers do, there is a need to treat project management not as a separate group of activities that parallel project development activities but as an inseparable part of project development (Larson et al*.,* 2014:210). Therefore, there is a need to incorporate project risk management into the methodologies used to develop projects.

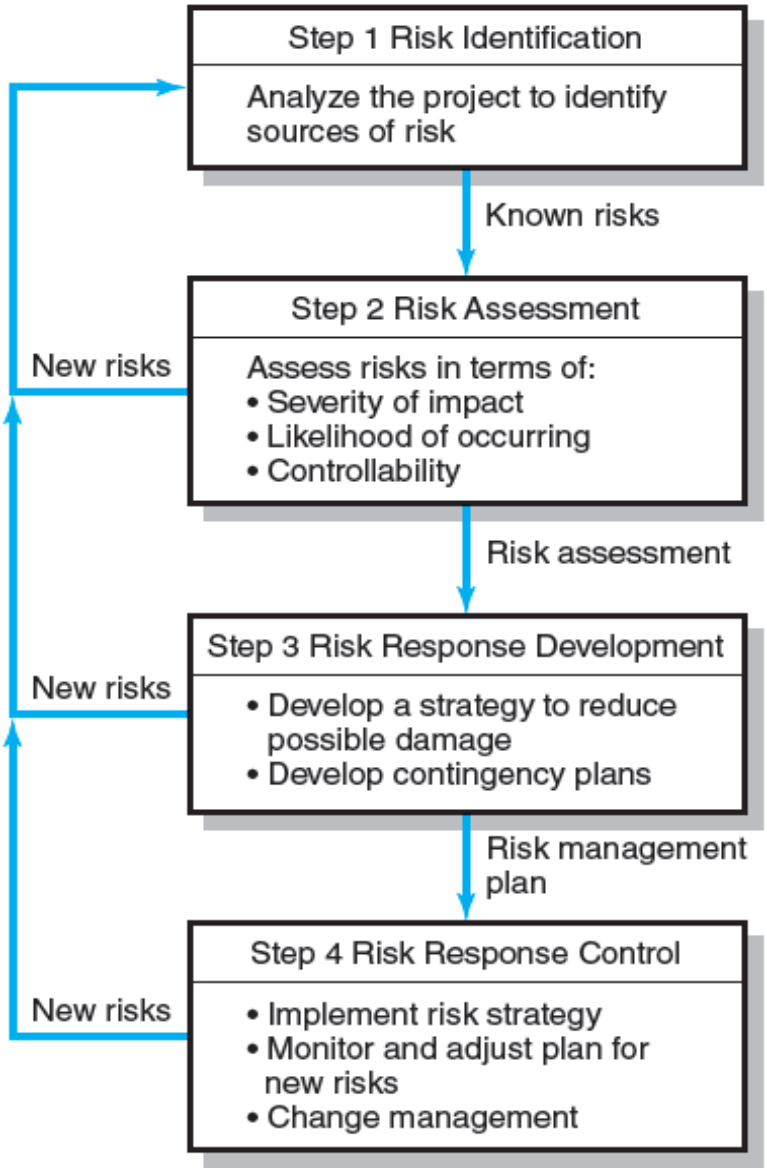


Figure 1.3: Risk Identification

1.3 Project Quality Management

Quality management involves satisfying the customer by delivering a product that meets the customer's requirements and is used as intended (Schwalbe 2010:434). According to Mnkandla (2012:288), quality management is a complex undertaking considering that changing requirements are inevitable for project development. The changes in requirements imply that the customer's quality expectations will also change as the project progresses. Based on the definition of quality given here, since there is a direct relationship

between quality and requirements, the quality plan for the project will have to be changed. This study methodology should therefore guide the proper planning of quality to avoid the risks of low-quality assurance standards and the number of defects in the final product (Schwalbe 2010:436).

1.3.1 Stakeholder management process

According to Eskerod and Jepsen (2013:78), Stakeholder management consists of all activities undertaken to enhance the success of a project's stakeholders. Eyiah-Botwe, Aigbavboa & Thwala (2015:1299) argue that the number and diversity of project stakeholders in the electrical engineering industry add complexity to stakeholder engagement and project management. This, combined with the power, needs, promotion and growth of diversity, influence, and stakeholder satisfaction as a success factor, has resulted in projects embracing the need for stakeholder consideration (Meding, McAllister, Oyedele, & Kelly, 2013:24). To accomplish this, it is necessary to identify all stakeholders, particularly crucial stakeholders, as well as their required contributions, expectations, power in relation to the project, and strategy for influencing each stakeholder (Jepsen and Eskerod, 2008: 65).

Stakeholder management (SM) should involve the systematic identification, analysis, action planning, communication, and negotiation of project stakeholders to influence them. (Lock, as cited by Eyiah-Botwe, Aigbavboa & Thwala, 2015:1299). Mitchell, Agle & Wood, as cited by Eyiah-Botwe et al. (2015:1299), propose a stakeholder identification and salience framework for categorising stakeholders based on the claim's urgency, legitimacy, and power. & Walker, as cited by Eyiah-Botwe et al. (2015:1299), provides a five-step process: identify, prioritise, visualise, communicate and engage with the stakeholders at the same time that the effectiveness is being tracked and monitored. Chinyio and Olamolaiye (2010) recommend utilising a stakeholder matrix. Nevertheless, additional research has confirmed that neither a formal approach to the SM process nor a consensus on the optimal model for developing nations exists (Yang, Shen, Drew & Xue, 2011:34).

1.3.2 Stakeholder engagement

Engaging project stakeholders is a crucial component of stakeholder management to ensure a project's success. It is a two-way communication process that promotes interaction between decision-makers and stakeholders. Mot, as cited by Eyiah-Botwe et al. (2015:1300), suggests that for effective communication in stakeholder engagement,

delivering the correct message, utilising an appropriate medium, and elucidating the project's values and benefits are crucial. Bourne & Walker, as cited by Eyiah-Botwe et al. (2015:1300), cite the stakeholder circle as a valuable project management tool to comprehend the nature of SM's impact as a result of power and influence for effective engagement. It identifies and ranks the most critical project stakeholders to develop an engagement strategy for a productive relationship.

According to research, stakeholders may interact with a project through either cooperation or conflict and competition in the political arena (Mintzberg, as cited by Eyiah-Botwe et al. (2015:1300). Newcombe, as cited by Eyiah-Botwe et al. (2015:1300), suggests the use of the power/predictability matrix and the power/interest matrix in assessing the importance of stakeholder expectations in project strategy analysis. A project manager can therefore engage with key stakeholders on "how likely each stakeholder group is to enforce its expectations on the project", "the means to do so", and the possible impact of stakeholder expectations on future project strategies. This research considers the fact that studies have revealed that a stakeholder management process involving a high level of pre-project planning effort can save up to 20% from cost and 39% of schedule in facilities projects if considered (Cho & Gibson, as cited by Eyiah-Botwe, et al. (2015:1300).

This study's primary purpose was to explore and evaluate the project managers' approach to managing project teams and its impact on the success of projects. In addition, the objectives were to determine to underline critical success factors that result in management failure of many projects and evaluate the extent of project manager engagement with crucial project stakeholders. Finally, recommendations were made based on the research findings to enhance on-time delivery, acceptable quality level and within the planned budget.

1.3.3 Conclusion

According to Larson et al. (2014:16-15), the velocity of change required to remain competitive or keep up has created an organisational climate in which hundreds of projects are implemented concurrently. This has created a multi-project environment and a plethora of new problems and challenges to management (PMI, 2010:34-35). Sharing and prioritising resources and aligning projects to support business strategy are some of the few challenges project managers face. To successfully implement projects in this environment, project management styles must adapt to the constantly changing environment.

1.4 Problem Statement

Leader behaviour directly affects how teams and individuals perform in a workplace. Additionally, the contingency theory based on leadership styles and behaviour is considered as informed by the type of followership, the tasks to be performed and the organisational culture. The difference in types of skills and perceptions of the project leader about subordinates also compounds the situation and allows for situational leadership. Since the tasks to be performed differ from project to project, it is equally expected that the leadership in electrical engineering projects may inform the patterns of behaviour and leadership accepted by practitioners in electrical projects. Therefore, this study is focused on the acceptability of specific leadership styles considered generically ideal for electrical projects. Furthermore, the study seeks to identify the expectations of the subordinates to a specific leader-member-exchange behaviour as a factor of effectiveness.

1.4.1 Research Questions

RQ 1: How does the project manager select the project team?

RQ 2: How does the project manager provide training to the project team?

RQ 3: How does the project manager relate to the project team?

The study comprises seven main sections. Section one includes the introduction, which summarises the shortcomings and has led to the background study in Section two. The literature review in Section three rigorously unpacks the available project management research body of knowledge. Section four presents the study objective, and section five presents the research methodology, which details the research approach, data collection and analysis methods adopted. Finally, the research conclusion is presented in section six, with section seven presenting the referencing.

1.5 Project Objectives

1.5.1 Primary objectives

- To determine the deficiencies in project management style which negatively affect the project team.

1.5.2 Secondary objectives

- To identify risks associated with wrong project team selection.
- To determine how the project manager relates to the project team.
- To identify if the project manager and project team perceive projects as value-adding.
- To determine if the project manager provides training to the project team.
- To determine if the project manager and project team document lessons learned from previous projects.
- To identify if the project manager has authority over the project team.

1.6 Research Methodology

This research aims to identify those project management style attributes that positively impact the project team. Being a quantitative study, the survey method to gather primary data will be via questionnaires (Easterby-Smith, Thorpe & Jackson, 2008: 11). The study is descriptive, cross-sectional, and confined to commercial projects, excluding residential projects. There were three target populations:

- senior managers,
- project managers and project staff or
- project teams from private and public sector projects.
- As project managers, independent professionals and non-professionals serve as the client's primary interface. They are the senior management exercising oversight over project staff. Project staff are those parties who do the actual project work.

1.6.1 Population

A population consists of individuals, objects, groups of measurements or characteristics, depending on what is to be studied (Jowah 2011:123). Jowah added that it is a collection of related units or elements that may have common variables that can be studied together to draw conclusions. The population of this research shall comprise senior management,

project managers and project staff in electrical engineering manufacturing industries in the Western Cape.

1.6.2 Sample

According to Jowah (2011:126), sampling is the process of identifying, selecting, and separating a representative part of the population of objects or individuals from which a survey will be conducted. Due to limited resources, the author will use sampling techniques and ensure that the sample size is representative of the population.

1.6.2.1 Sampling method

This research will be based on a probability sampling technique. According to Jowah 2011:130, probability sampling is a technique in which each element of the population has an equal chance of being selected or a known (nonzero) likelihood of getting selected.

1.6.2.2 Sample size

Watkins (2012:65), defined sample size as the act of choosing the number of observations or replicates to include in a statistical sample. Jowah (2011:129) added that the larger the sampling, the higher the possibilities of getting the correct generalisations about a population. According to Watkins (2012:66), if the population size N is greater than 1000, the population size becomes almost irrelevant, and the sample size of 400 will be considered representative.

1.7 Data Collection Instrument

Questionnaires serve in this study as the collection instrument of the data. Watkins (2012:74) defined a questionnaire as a list of carefully structured questions chosen after considerable testing to elicit reliable responses from a chosen sample. To make it easy for the participants, the questionnaires are divided into two sections. Part One consists of close-ended questions, where participants can choose the appropriate answers with a "tick". Part Two is close-ended, where participants are requested to rate their opinions by making a cross in the appropriate box with the level of agreement in each of the statements by indicating whether; Strongly agree, Agree, Uncertain, Disagree, and Strongly disagree, with the statements describing project management style. Participants are welcome to comment on this research at the end of the questionnaire.

1.7.1 Data collection method

Only active project staff are classified as project team members for this study. Population details of project staff were obtained from selected registered businesses in the Western Cape, which indicated a population size of 120. Population details in respect of project managers and senior managers were obtained from the selected businesses in the Western Cape, which indicated a population size of 68 for the Cape Town area. Due to the relatively small population, an attempt to conduct a census was made. A census is a sampling plan which gathers information from an identified population, according to Brown & Suter (2014).

Therefore, questionnaires were administered personally by the researcher to 68 project and senior managers and 120 project staff. Fifty-seven project and senior managers and one hundred and two project staff responded, constituting a response rate of 83.82% and 85%, respectively. The questionnaire covered a biographical section and a section examining the style factors of project management. The purpose of including the biographical section was to test for statistically significant variance between the designated biographical factors and views of project management style factors. The section relating to the impact of project management style on project team performance consisted of 36 questions divided into six categories of six questions. Category one looks at interpersonal factors; category two looks at the application of theory; category three looks at personal character, category four looks at personal contribution; category five looks at personal skill; category six looks at practical application. These comprised closed-ended questions using a five-point scale (strongly agree – strongly disagree, where 1 indicates strongly agree and 5, strongly disagree). Closed-ended questions were favoured because they reduce respondent bias and facilitate questionnaire coding (Akintoye & Main, 2007: 597-617). After the questionnaire, respondents were invited to provide any pertinent comments. Using descriptive and inferential statistics, analyse the quantitative data as explained in the paragraph below.

1.7.2 Data analysis

The researcher will ensure that the data obtained in this research is valid and reliable. Collis and Hussey, as cited by Watkins (2012:74), state that validity concerns the extent to which the research findings accurately represent what is happening. This research will focus on the following form of validity.

- Content validity,
- Criterion-related validity and
- Construct validity.

Reliability also called 'trustworthiness', is concerned with the findings that ensure that this research's findings are reliable and that the same findings can be obtained if another researcher does the research. There are three common ways of estimating the reliability of the questionnaire responses, namely 'test re-test method', 'split-halve method' and the 'internal consistency method' (Watkins 2012:75-76). This research shall use the test re-test method to test the data's reliability.

1.8 Ethical Considerations

Saunders et al*.,* as cited by Watkins (2012:77), refer to ethics as the appropriateness of your behaviour in relation to the rights of those who become the subject of your work or are affected by it. According to Leedy & Ormrod (2010:101-104), most ethical issues in research fall into one of four categories: protection from harm, informed consent, right to privacy, and honesty with professional colleagues. All respondents in this research were informed about their rights as follows.

- Responses cannot be traced to any individual.
- The free and frank expression of opinions will be most helpful.
- Participants have the right to withdraw from this study at any time, as participation is voluntary.
- There are no correct or incorrect answers to any items in the questionnaire.
- It is their opinion on each of the statements that matter.

1.9 Chapter Classification

Chapter 1 introduces the subject, provides an initial literature review, and develops the study gap – problem statement, research objectives, research questions, research methodology, population targeted for the research, methods used for sampling and the sample size. The data collection instrument and methods are discussed briefly before the ethics consideration and a chapter summary.

Chapter 2 distinguishes management from leadership, identifies critical project management knowledge areas, applies soft skills to people with technical skills, discusses the importance of these in relation to the type of tasks, and addresses the prevailing work ethics amongst people with hard skills.

Chapter 3 focuses on basic performance-enhancing theories, the concept of teams, team dynamics [motivators and demotivators], the impact of specific human relations on work loyalty, the control of team members, and the ability to draw congruency between team members and team leaders.

Chapter 4 provides details on the research methods, types of methods, differences between research design and research method, the need for a research method, the impact of the method on findings, the population, the sampling methods chosen and reasons why, sample size and reason, research instrument and reason for use, data collection and analysis.

Chapter 5 makes use of graphs and tables to illustrate the responses and analyses the responses given.

Chapter 6 closes off the research by providing conclusions and recommendations based on the responses and analyses given in chapter 5.

1.10 Conclusion

When reviewing the top ten project management styles, the first seven factors are all seen to be related to the managerial and personal behaviour. This is in contrast to their technical skills. Leadership, strategic direction, communication, problem-solving, and supervision are high-ranking factors. This observation demonstrates that peers continue to view the project manager as a figure of authority who must be able to guide the team through a project. These observations support Odusami's findings, as cited by Gewanlal et al. (2015: 46) and Muller & Turner (2007: 22-23). With technical capabilities among the top ten out of 36 project management style factors presented in the questionnaire, the importance of a balanced skillset for project managers is reaffirmed. It should be considered when designing project management training and skills development programs.

Despite the numerous sources, a relatively small number of potential respondents, and the possibility of the study displaying some bias, the findings are intriguing and are very likely representative of the South African project management industry. To some extent, the

results of this research and the low level of concordance support the general findings by Lawless (2007:37). He discovered that the civil engineering and construction industries are in disarray. The relative disagreement regarding what should be expected of project managers has the potential to create tension during personnel recruitment and selection. Consequently, stakeholders must develop a shared understanding of what factors are crucial and which project management leadership style and personal attributes are required for project managers in the industry.

CHAPTER 2
LEADERSHIP VS MANAGEMENT IN PROJECT MANAGEMENT

2.1 Introduction

Project managers manage projects, people and resources that demand high management and leadership skills. Jarad, as cited by Liphadzi, Aigbavboa & Thwala (2017:478), states that leadership is viewed as a subset of management; both are important to facilitate organisational performance. Project management requires management and leadership skills, and any effort to separate the two is likely to cause more problems than it solves. The project manager's job is initiating, planning, executing, monitoring, controlling, and closing the project (Larson et al*.* 2014:16-17). The project leader's job is to influence, inspire, and motivate team members and other stakeholders to higher levels of teamwork (Liphadzi et al*.* 2017:479). Leadership is part of the human side of project management. Therefore, project managers must understand the characteristics and features of these definitions as they underpin the project leadership body of knowledge.

2.2 Management And Leadership Skills Needed by A Project Manager

A. Management Skills

As project management and performance management gain momentum in electrical engineering industries, the question often arises as to if, how, and when these applications should complement each other in various projects implementation (Van der Waldt, 2012:217). Project management includes planning, execution and managing the project's people, resources, and scope (Larson et al*.* 2014:16-17). Therefore, objectives which have been clearly conveyed by management and wherein all levels of the organisation can see it being achievable must be created by the management structure. According to Tseng & Levy (2018:4), management manages the scope and limited resources and ensures that the project is on schedule, meets minimum customer requirements and is within the planned budget.

B. Leadership

Leadership is critical in accomplishing the vision and mission of all organisations. Northhouse (1997:234) defines leadership as a process whereby individuals can influence other individuals to achieve or reach commonly desired outcomes. Lynham and Thomas (2006:567-568) expand this definition to include a participatory, interdependent, and focused performance management system in which there is dynamic relationship; influence; discussion; and discourse related to inputs, processes, outputs, organisational procedures, feedback, and performance outcomes. Leaders determine the course for the rest of us; they help us see what lies ahead; they assist us in visualising what we may accomplish; they motivate and inspire us. Without leadership, a group of humans quickly devolves into argument and discord because we see things differently and gravitate toward alternative solutions. Leadership assists us in aligning our efforts and focusing them in the same direction (Liphadzi, 2015:87).

2.2.1 Relationship between Leadership and Management

Project managers manage projects and people. This function requires both management and leadership skills. Management and leadership must go hand in hand. Jara 2012:567 viewed leadership as a subset of management, which is important to facilitate organisational performance. This, therefore, implies that management and leadership are linked and complementary. According to Price (2009:26), management's job is to initiate, plan, budget, execute, monitor, control, and close the project. Bartol et al., as stated by Liphadzi et al., refer to a project leader's job as influencing, inspiring, and motivating team members and other stakeholders into higher levels of teamwork.

Along with management and leadership roles is the differentiation between internal and external roles. According to Price (2009:27) and Zalesnik (2004:76), managers' objectives stem from requirements, whereas leaders' objectives stem from intrinsic attitudes. This theory's concept is that leaders will use their resources to encourage employees to be innovative in their problem-solving approach. At the same time, managers are responsible for ensuring the company's day-to-day operations are carried out, which may include instructing subordinates on the actions they must take. Table 1 below gives direct

comparisons between leadership and management activities. An individual can be a great leader, a great manager, or both, but each area requires the mastery of slightly different skills and competencies.

Table 2.1: Leadership versus management

Management Produces **- Order & Consistency**	**Leadership Produces** **- Change & Movement**
• Planning and Budgeting • Establishing agendas • Setting timetables • Allocating resources	• Establishing Direction • Creating a vision • Clarifying the big picture • Setting strategies
• Organizing and Staffing • Provide structure • Making job placements • Establishing rules and procedures	• Aligning People • Communicating goals • Seeking commitment • Building teams and coalitions
• Controlling and Problem Solving • Developing incentives • Generating creative solutions • Taking corrective action	• Motivating and Inspiring • Inspiring and energise • Empowering subordinates • Satisfying unmet needs

Source: Liphadzi et al. (2017:480)

2.3 Critical Project Management Knowledge Area

2.3.1 Management style in project management

This project aims to identify the management style adopted by successful project managers in electrical engineering industries. Due to the increase in project management interest in industries and its new challenges, different disciplines, competence, and skills are now required from project management practitioners (Garel 2013:902). People in electrical engineering industries have vital roles in ensuring organisational objectives are achieved. Ramos, Mota & Correa (2016:902) argue that successful project managers must have personal flexibility and the skills to vary their behaviour according to their staff's individual needs and motives. Bejestani (2012:48) agrees that management and leadership styles can affect project success. Management style and organisational culture is aligned, and a company's management style reflects its identity (Oledo-Cifuentes & Martinez-Leon,2014:199).

According to McCarthy, Puffer, Vikhanski & Naumov (2005:37-38), the new requirements to change the management style in failed projects are based on changing one or five of the following fundamentals;

1. Develop a customer-oriented culture.
2. Create business strategies that emphasise differentiation.
3. Redesign business processes.
4. Manage knowledge and information.
5. Develop new leadership styles.

Ramos et al. (2016:902) argue that professional project managers can improve their competencies and achieve better results by knowing and understanding different management styles, even if they are unaware of or faithful to a particular style.

2.3.2 Models of Project Management Styles

Project managers have many roles and responsibilities, inherent and learned skills, and their behaviour is affected by personal, social, and economic bias (Ramos et al. 2016:903). Theorist and practitioners agree that management influence human performance, but the specific dimensions have not been pinpointed precisely. According to Harvey & Turnbull (2006:58-59), a management style can be developed to support a low-cost strategy, combining a low-cost operator system and higher-quality service. Driver, as cited by Remos et al. 2016:903, states that the information and the number of alternatives is the main factors to be considered when defining the appropriate management style one can adopt in the five-style model that is;

- **Decisive Style:** uses little information to make decisions. Actions are relatively straightforward, and there is mitigation planning with no respect for hierarchy. This applies to organisations with well-defined tasks and problems solved one at a time. Results drive this style.
- **Flexible Style:** this style uses little information and tries to analyse different aspects, termed as adaptive, flexible, and creative. It works best in an organisation with little structure and fewer rules. Decisions are based on group discussions.
- **Hierarchical Style:** plans are made at the right time, making maximum use of information to achieve the single best solution. The detail-oriented and centralised controller is concerned with the method to be used and the expected results.
- **Integrative Style:** here, there is excessive use of information. An individual in this group generates a more significant number of possible alternatives for the decisions. These decisions are open for modification leading to delays in decision-making. This works well in less rigid organisations where projects are long in duration and well-developed.
- **Systemic Style:** this style is complex and challenging to understand. There is a combination of the qualities of integrative style with hierarchical style. The manager emphasises priorities and detailed strategies to address the problem, and there is short-term planning with specific and measurable goals.

2.3.3 Project Management Knowledge and Organization Factor

Project management knowledge influences the organisational elements of leadership, communication, stakeholder, risk, and trust (Culp & Smith cited by Burger et al., 2015:51). These elements are discussed because they emphasise the significance of industry-specific knowledge and its effect on project success. Kerzner (2013:67) states that organisational factors such as leadership, communication, stakeholder, risk and trust influence project management style and contribute to project success.

2.3.4 Project Leadership

To be a good leader, project managers should have some leadership responsibilities (Kerzner, 2013:67). Leadership contributes to project success (Heldman, 2006:34). Leaders need to be competent, requiring technical knowledge, interpersonal skills, and expertise in project management (Culp & Smith, cited by Burger et al., 2015:51). Without knowledge and the requisite skills, a project manager's leadership will suffer, as visionary leaders inspire and motivate others through effective leadership and project management (Heldman, cited by Burger et al., 2015:51). However, to motivate others, effective communication is critical.

2.3.5 Leadership Style and Context

According to Frame, as cited by Muller & Turner (2007:22-23), four leadership styles of laissez-faire, democratic, autocratic, and bureaucratic can be appropriate at different stages of a project life cycle (i.e., feasibility, design, execution, and close-out). Zulch (2014:73) argues that the personality of a leader, the maturity of followers and the environment's needs determine the leadership style to follow. An effective leader can adapt a style or combination of leadership styles to suit the circumstances. Project managers are often selected or not selected because of their leadership styles (Xerzner as cited by Zulch 2014:173).

Muller & Turner (2010:34-36) show that leadership styles can be classified into six broad categories: directive, pacesetting, participative, visionary, coaching and affiliative. Kerzner

(2009:279) added two styles, namely bureaucratic and laissez-faire. According to Zulch (2014:173-174), these leadership styles are characterised as.

i. The authoritarian/directive/commanding style: characterised by dominance and total control by the leader and is ineffective in motivating team members.
ii. The pacesetting style is characterised by meeting challenges and goals.
iii. The democratic/participating style: characterised by the team's participation in decision-making, and such a leader will hold frequent meetings and establish methods to obtain employees' input. These inputs will assist the leader in knowing and understanding the environment better.
iv. The transformational/visionary style: inspires a team with a shared vision of the future. This leadership style is evident in the organisation, frequently speaking in public, holding frequent meetings and sending out statements that motivate and guide all employees.
v. The coaching style: characterised by strong mentoring and probably places importance on training and development, thus enhancing employee effectiveness through skills and knowledge.
vi. The affiliative style: creates harmony by connecting team members one-on-one or in small groups. The characteristics of this style determine how project leaders deal with a team member.

According to Smit & Cronje (2002:34-38), there are known leadership styles generally selected by the business management arena which can be applied individually, selectively or in combination depending on different situations and are:

a. Contingency or Situational Leadership Style: Is the concern with the appropriateness of different leadership styles in different leadership situations by matching the personal characteristics of a leader to the leadership situation (Muller et al. 2010:418).
b. Sloan or Visionary Leadership Style: this style is vision orientated, and for it to be effective in managing the project, the project manager should be an analytical

thinker and achievement-orientated (Muller et al. 2010:419). Here project leader uses the vision to give the life and work of the organisation a sense of meaning and purpose. Furthermore, according to Skipper & Bell (2006:5), these leaders enlist others by involving them, listening to them, and clearly communicating with them.

c. Path Goal Leadership Style: This is a leadership style in which a leader must assist the members in attaining the organisation's goals (Smith et al. 2002:44).
d. Fiedler's Leadership style: Fiedler, as cited by Zulchi (2014:174), presents a theory of leadership effectiveness that considers leadership personalities and situational factors in the leadership situation. Fiedler's theory matches the style and the situation, changing the situation so that it is compatible with the style (Smit et al. 2002:35).

McGregor's Theory X and Theory Y Style: McGregor proposed two fundamental approaches to managing people—theory X and theory Y—as follows:

i. Theory X assumes that the average person will do all to avoid work and responsibility and must be directed and forced to work. Liu, Fellow & Fang (2003:14-15) describe theory X as employees-centred or people orientated.
ii. Theory Y assumes that team members enjoy work and will take responsibility for applying and directing the project's aim. Team members manage and work independently. Theory Y is production-oriented (Burke & Barron 2007:8).
iii. Life Cycle Leadership Style: This leadership style is a contingency approach and must adapt to the maturity of employees. As cited by Zulchi (2014:174), Hersey and Blanchard explain maturity as the desire to achieve, a willingness to accept responsibility, and working knowledge and experience. Smit et al. (2002:34) state that effective leaders are neither pure task nor relationship behaviourists but aim to achieve a relationship between the task and relationship.

iv. Behavioural Leadership Style: This style distinguishes between two basic styles: task-orientated and people-orientated or relationship style. According to Walker (2007:11-12), achievement, motivation, willingness, and ability to take responsibility, education and experience determine the mixture of the two basic styles.

v. Action-Centred Leadership Style: this style focuses on leadership activities in which the project leader focuses on tasks, team and individual, acting on the demand of each other. Burke & Barron (2007:8) added that a project leader must attend to the task, team and individual responsibilities but should focus on each one at different times to deal with specific needs. For example, in task orientation, the purpose of a team is to complete some work, so the leader must focus on achieving objectives. On the other hand, team orientation requires the leader to ensure that the team's collective needs are identified, and that group cohesion is maintained. Finally, individual orientation requires the leader to recognise that each group member or team will have individual personal needs (Burke et al. 2007:12-13).

2.3.6 Knowledge Types of Project Management

Two schools of thought characterise what knowledge is required by project managers. These are generic or industry-specific knowledge (Besner & Hobbs, 2008: 16-33; Cadle & Yeates, as cited by Burger et al., 2015: 52). Those who adhere to the generic school of thought consider project management to be transferable across industries. It implies that a project manager can succeed only with the project toolkit. This implies that a project manager's technical knowledge of the industry in which he or she operates is unimportant (Turk, 2007: 25). Implicationally, a project manager does not need technical knowledge of the project environment. On the contrary, they can depend on the knowledge acquired regarding project management.

According to the industry-specific school of thought, a project manager's familiarity with the industry of the project they are managing is crucial. The only point of agreement between

the two perspectives is project management. The industry-specific perspective holds that all project managers must possess industry and project management expertise (Turk, 2007: 25).

2.3.7 Project management knowledge (generic)

Project management knowledge can be viewed as a toolkit. This toolkit is used and transported to any industry, regardless of the project manager's knowledge of the industry being managed. The PMI Project Management Body of Knowledge (PMBOK) 4th edition identified and listed nine generic knowledge areas. The PMI PMBOK 5th edition of 2015 listed ten knowledge areas, with stakeholder management being a new addition (PMBOK, 2015: 44). The nine knowledge areas are integration management, scope management, time management, cost management, quality management, human resource management, communication management, risk management, and procurement management (PMBOK, 2008:45).

The PMI Construction extension to the PMBOK identified four extra areas that have been stipulated in the guide, namely financial management, claims management, environmental management, and safety management (PMI Construction PMBOK, as cited by Burger et al., 2015: 45). This indicates that the PMI agrees that a generic approach to the electrical engineering industry does not suffice. Furthermore, publishing a PMI engineering extension to the PMBOK acknowledges the need for further industry knowledge. This suggests that industry knowledge is essential for project managers.

2.3.8 Project management knowledge (industry specific)

As stated in the PMBOK (2008), project managers need industry knowledge, project management knowledge and general management knowledge to be effective in their job. This adds to the efficiency and effectiveness of the management of projects. This is also supported by Ashworth & Hogg (2007: 379-380), who state that project managers need industry knowledge to do specific tasks effectively. This may include developing a project strategy, evaluating tenders, coordinating design processes, and participating in contractor selection (Ashworth & Hogg, 2007: 379-380).

The SACPCMP (South Africa council for the project and construction management professions) also supports the importance of industry knowledge. They note that, to be able to conduct the projects effectively, a project manager needs to have certain competencies, namely project management competencies and technical competencies (SACPCMP, as cited by Burger et al., 2015: 55). Table 2 below lists the four areas provided by the SACPCMP and reflects the required knowledge within these areas.

Table 2.2: Technical knowledge of a construction project manager

Technical knowledge areas	***Required knowledge***
Knowledge of construction science	Understanding structures
	Understanding construction and building sciences
	Understanding construction and building finishes
	Knowledge of building materials
Knowledge of design processes	Site, plant, and equipment
	Formwork systems
	Quality management

	Health and safety management
	Environmental management
	Organizational/Management structures
	General building sequences
	General output and production factors
	Basic knowledge of building trades
Knowledge of design processes	Sequence of design processes
	Time required for design processes
Knowledge of financial and cost factors	Financial processes
	Cost of construction

Source: Burger et al. (2015: 54)

2.4 The Application of Soft Skills or Technical Skills in Projects

2.4.1 Soft Skills

Whether they are called soft skills, nontechnical or professional skills, applying these soft skills in project management is becoming more critical to project managers and technical professionals. As quoted by Kesornkaew, Tewaboot, Klinthaisong & Somprach (2013:112), Gillard states that excellent soft skills are necessary for project success. Soft skills fulfil an important role in shaping an individual's personality (Schulz, 2008). A perfect blend of personal qualities, soft skills and hard skills will contribute to enhancing project success (Wye & Lim, 2009).

Effective supervision and management of technical projects depend upon the ability of a project manager to use soft skills. According to Susan (2017:1-2), the quality of technical contribution by project team members increases when individuals work more collaboratively with their project manager. Soft skills help improve personal effectiveness, providing a vehicle to deliver project results. Project managers can use several qualitative and quantitative methods to determine the impact of soft skills on a project. One way of measuring the impact is by surveying project participants and their supervisors according to Kirkpatrick's level of evaluation (Susan 2017:1).

2.4.2 Hard or Technical Skills

Hard skills enable project managers to deliver project packages in a more cost-conscious and controlled way. To make the best use of their often-limited human resources to create a competitive advantage and meet customer requirements (Fisher 2010:994). Hard skills enable a project manager to integrate organisational functions and motivate groups to achieve higher levels of performance and productivity. Due to the increase in product and service quality by customers, hard project management skills are a necessity for today's project managers. Verma, as cited by Fisher (2010:995), stated that conflict management is a key requirement for a project manager, as conflict in projects is inevitable.

2.5 Critical Soft Skills Attributes for Project Manager

The project manager's role in today's changing business environment and working practice has increased dramatically since the 1990s (Cleland, as cited by Fisher 2010:994). According to Fisher (2010:994), project managers in industries are expected to deliver project work packages in a more cost-conscious and controlled way while striving to make the best use of their limited human resources to create a competitive advantage and meet customer requirements. Crawford (2000:10) argue that as more and more organisations adopt project management as a modus operandi to deliver work packages, there is an increased interest in the people skills of project managers. As cited by Fisher (2010:994), Dainty suggests further insights that support the need for new and improved effective people skills and associated behaviour for project managers.

According to Lippman, Ryberg, Carney & Moore (2015:5-6), there are five critical skills most likely to increase the odds of success across all outcomes which companies expect project managers to display. These five critical skills are illustrated below:

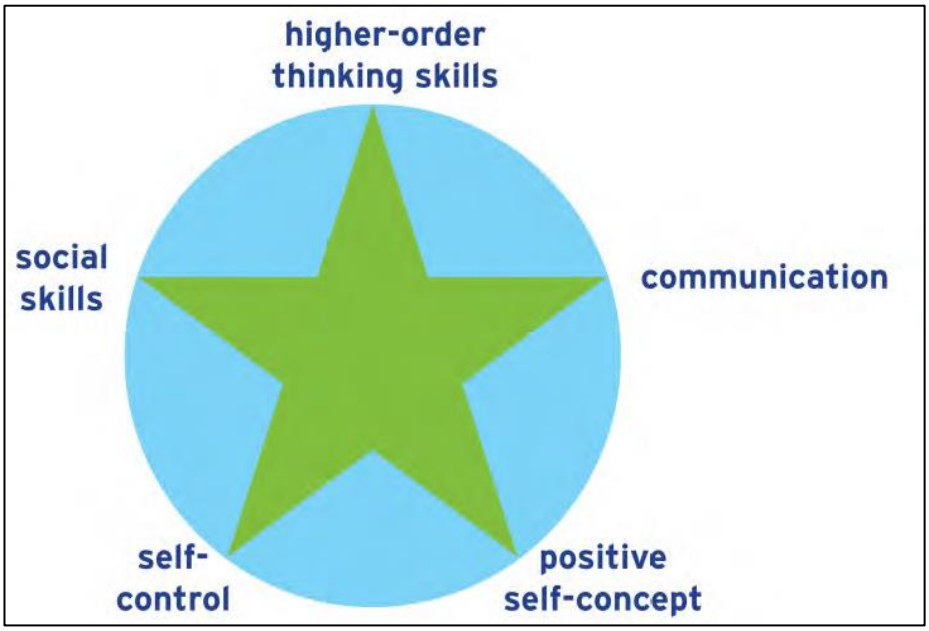


Figure 2.1: Critical soft skills for project workforce success

Source: Lippman et al. (2015:5)

- **Social Skills:** Help project staff get along well by respecting others, using context-appropriate behaviour, and resolving conflicts. Social skills are universally important and predict all four types of workforce outcomes: employment, performance, income/wages, and entrepreneurial success, and are seen as critically important by experts in the field of project management. Social skills are supported across all types of industries globally.
- **Communication Skills:** This refers to the type of communication used in the workplace and includes oral, written, nonverbal and listening skills. Strong general communication skills contribute to developing other soft skills, like social skills. Communication skills are distinct and essential for workplace success across sectors. They are the most frequently sought skills among employers, and stakeholders in major industry projects strongly endorse them.
- **Higher-Order Thinking Skills:** This consist of problem-solving, critical thinking and decision-making skills. This includes identifying an issue and collecting information from multiple sources to evaluate options to reach a reasonable conclusion. Higher-order thinking is very much sought by employers and is critical for all four workforce outcomes in all regions of the world. However, these skills are complex to measure in a survey, and less empirical research has been conducted on how these skills relate directly to successful employment.
- **Self-Control Skills:** This refers to one's ability to delay gratification, control impulses, direct and focus attention, manage emotions and regulate behaviours. Self-control is an intrapersonal skill, foundational to many others: it enables successful decision-making, resolution of conflicts and coherent communication. Self-control is highly related to all four workforce outcomes.
- **A Positive Self-Concept:** This includes self-confidence, self-efficacy, self-awareness, beliefs, self-esteem and a sense of well-being and pride. Positive self-concept is another intrapersonal skill that is important for workforce success. It is related to success across all four workforce outcomes.

2.5.1 Barriers to the Application of Soft Skills in Projects

- **Education:** Lack of education among project staff can hinder a project manager's effort to apply soft skills.
- **Organisational culture:** A particular belief by an organisation's employees can affect a project manager's ability to apply soft skills in project management.
- **Aggressive deadlines:** Since all projects are always under intense pressure to meet deadlines, project managers sometimes display an authoritative style in project management and do not apply soft skills.
- **Poor conflict resolution:** Poor resolution of conflicts in a project can affect the ability of project management to apply soft skills.
- **Limited project budget:** Lack of funds to finance the project can affect the project manager's ability to apply soft skills.
- **Project staff competency:** Low knowledge base or lack of skills by project staff can hinder a project manager's ability to apply soft skills in project management.
- **Globalisation:** With increased globalisation and projects being run in more than one country. This can hinder a project manager's ability to apply soft skills.

2.5.2 Effect of Soft Skills on Project Outcome

According to Howes et al. 2017:2, the impact of soft skills on a project can be determined by surveying project participants and their supervisors. The impact of soft skills can be derived from the project leader's ability to influence, inspire, and motivate team members and other stakeholders to higher levels of teamwork. This is vital when leading a group of people, a project, or an organisation. It involves establishing direction and influencing others to follow that direction, establishing a clear vision, and sharing that vision with others so that they will follow willingly. In addition, the leader will be committed to providing the information, knowledge, tools, methods, and resources to attain that vision while coordinating and balancing stakeholder interests.

2.6 The prevailing work ethic amongst people with hard skills

2.6.1 Project Communication

Communication is essential for leading, integrating people, and making decisions to ensure the success of a project. (Garbharran et al., 2012:94). There must be a shared project vision, where the project manager identifies the interests of all relevant stakeholders and ensures that there is buy-in to the project (Yang, Shen & Ho, 2009: 166). According to Zwikael (2009: 385), once the project objectives are set and the scope clarified, there must be constant updates as the project progresses. Progress on activities assigned to individuals or groups needs to be monitored to achieve overall goals. These updates must be communicated to the relevant parties. Newton, as cited by Garbharran et al. (2012:94), believes that a detailed communication plan is necessary to disseminate information effectively. To this end, frequent project meetings are necessary. Besides consulting with the community, direct local involvement is key to project success. Given the relatively high unemployment rates in South Africa, consideration must be given to residents. This could include sourcing materials and human resources from local suppliers and residents. It is advisable to use an influential community member as a liaison between the project manager and the community (Teo, 2010: 222). Finally, proper handover procedures need to be developed. This is an important consideration, given that the project management industry is increasingly viewed as a service industry (Karna, Junnon & Sorvala, 2009: 117).

2.6.2 Project Trust

Trust is an essential element of a project and impacts a project's success. It is, therefore, important to understand how it develops and where it comes from (Romahn & Hartman, cited by Burger et al., 2015:52). Robbins, cited by Burger et al., 2015:52 states that trust is based on five dimensions, namely integrity, competency, consistency, loyalty, and openness. Competency includes technical and interpersonal knowledge and skills. This once again highlights that a project manager needs to have knowledge to be trusted by team members. Trust has an influence on effective communication (Romahn & Hartman, cited by Burger et al., 2015:52), and communication is essential for successful project

management (Chiocchio, 2007: 97). It is imperative to have trust within a project to ensure a successful project. Therefore, a project manager needs to improve the ability to communicate, organise, build teams and provide leadership (Birkhead, Sutherland & Maxwell, cited by Burger et al., 2015:52).

2.6.3 Project Team Competence

The competence component identifies the following four aspects as being central to successful project management in project management.

- **First**, utilisation of up-to-date technology. Nguyen, Ogunlana & Lan, cited by Garbharran, Jeevarathnam & Thulani (2012:93), believe that adopting new technology and utilising it to its full potential has become critical in achieving a competitive advantage in project management. In addition, project management has witnessed significant technological developments in recent years. Therefore, selecting the appropriate new technology and optimal utilisation is key to project success.
- **Secondly**, there must be proper emphasis on experience. According to Pathirage, Amaratunga & Haigh (2007: 117), tacit knowledge plays a key role in this regard. In addition, project members should be encouraged to document tacit knowledge gained from the project to prevent mistakes in subsequent projects.
- **Thirdly**, competent teams must be in place, implying that staff members must have the necessary skills (Melkonian & Picq, 2010: 82). This requires a comprehensive skills analysis that should reveal gaps in skills. Finally, awarding bids to the right project manager/contractor needs consideration. Project management in South Africa has witnessed increased contractors, resulting in more intense competition in this sector. The Black Economic Empowerment (BEE) status of a contractor plays a key role in selecting contractors, especially in the case of public sector projects. Other considerations when selecting contractors include company track record, quality management, health and safety, and technical proficiency (Philips, Martin, Dainty & Price, 2008: 312).

2.6.4 Commitment

Commitment emphasises the support of top management, commitment to the project, clear objectives and scope, and political support. The support of top management goes beyond the provision of funds and making resources available. Johnson, Scholes & Wittington, as cited by Garbharran et al. (2012:94), believes that commitment to the project is very closely linked to a sense of collectivism rather than individualism. An environment needs to be created in which team members experience job satisfaction and are, therefore, motivated to be part of the team. Optimal performance by team members is essential. Having clear objectives and scope is vital in providing direction to team members. Objectives must be clear and scope as simple as possible to avoid "grey areas". Changes will inevitably occur during the project. Flexibility and adaptability are, therefore, central to achieving success. Finally, political support is vital for project success, given that a large proportion of projects are public projects. To this end, support from non-governmental organisations and the ruling party is necessary (Jacobson & Choi, 2008: 646).

2.7 Conclusion

This chapter distinguishes management from leadership, identifies critical project management knowledge areas, the application of soft skills to people with technical skills, discusses the importance of these in relation to the type of tasks, and addresses the prevailing work ethic amongst people with hard skills.

CHAPTER 3
THEORETICAL FRAMEWORK AND LITERATURE REVIEW

3.1 Introduction

This chapter focuses on basic performance-enhancing theories, the concept of teams, team dynamics [motivators and demotivators], the impact of specific human relations on work loyalty, the control of team members, and the ability to draw congruency between team members and team leaders.

1. The Concept of Team in Project Performance Enhancement
2. Team Creation or Team Formation

There is limited data to support a particular method for optimal team creation in electrical engineering industries (Gaviola, Alanda, Howard & Yuet 2019:01). This research aimed to evaluate a systematic approach to team creation and compare the impact on team dynamics to teams created via random selection. According to Gaviola et al. (2019:01), a systematic approach to team creation improved team members perceived team dynamics, consequently significantly impacting project performance. Therefore, in large industries, a web-based platform in a systematic approach to team creation is feasible and may provide an avenue for assessment approaches related to teamwork and team dynamics.

A. Team Wisdom in a Multi-Faceted Process

While the concept of wisdom, which refers to how team members make proper use of their knowledge through their practical action, judgements and ethical decisions, in general, attracts researcher interest in a variety of disciplines but little is known about how wisdom is conceptualised and then operationalised in managing projects in electrical engineering industries.

Ghobadi, cited by Akgun A. (2019:228), states that project management is an operational industry that is a knowledge-intensive and complex process involving different individuals and departments and their respective knowledge and expertise. There is a common understanding that effectively managing the knowledge in electrical engineering industry

projects through reconfiguring and exploiting existing knowledge assets and exploring gathered new knowledge is imperative to cope successfully with projects and project-related risks. This would thus lead to completing projects successfully and on time (Neves, da Silva, Salomon, & Satomode 2014:546). Project success not only relates to the knowledge stock or existing knowledge assets that project development team members have but also to their collective abilities to understand what knowledge to select and use (Akgun, Keskin & Kircovali 2019:18).

B. Knowledge Hiding Negatively Affect Project Performance

Knowledge hiding, a unique concept distinct from knowledge sharing, frequently occurs in functional project teams. Zhang Z. (2019:225) states that although knowledge hiding has been proven to cause distrust and reduce individual creative performance, little is known about the negative influences of knowledge hiding on team performance in project teams in electrical engineering industries. According to Linder & Wald, as cited by Zhang Z. (2019:225), knowledge is a critical resource for sustainable organisational development and success. To better capitalise on organisation-wide knowledge, organisations increasingly rely on project teams to carry out tasks related to the design, development, manufacturing, and marketing of new products (Olaisen & Revang, 2017:14). Effective knowledge sharing was found to improve product innovation, team creativity and project team performance (Park & Lee, 2014:234).

C. Shared Leadership in Project Teams and the effect on Project Performance

Today workplace is becoming increasingly project-centric, with projects growing more complex and requiring the use of many different team types, including multidisciplinary teams, multiple teams and sometimes inter-firm teams to deliver project objectives (Von Danwitz, 2018:18) efficiently. Often these project teams are co-located, but some work virtually and are dispersed across time and geographical zones, presenting additional challenges for coordination (Muethel & Hoegl, 2016:241). Pearce & Manz, cited by Scott-Young, George & Grisinger (2019:516), state that any single individual will rarely possess all the knowledge and skills necessary to direct or carry the entire project team performance. Scott-Young et al. (2019:565) state that effective integrated project teams

collaborate to use members' diverse expertise and contribution fully and can draw upon the leadership of more than one person to manage and coordinate different tasks. According to Singh & Jampel (2010:16), modern organisations now recognise that every person is a leader in their sphere and that shared leadership is a valuable mechanism for managing complex project environments. Scott-Young et al. (2019:566) agree that the concept of participatory or empowered leadership, where leadership roles are shared among team members, has been gaining increasing attention from both scholars and practitioners in multiple industries where teamwork is a standard work practice.

D. The Positive Effect of Creating Emotions on Knowledge Creation Capability and Performance of Project Teams

Organisations are built around teams to manage complex work efficiently, such as technological projects (Stephens & Carmeli 2019:862). However, complex teamwork presents challenges that can often generate positive and negative emotions and demand efforts to generate new knowledge. Bartsch, Ebers & Maurer (2013:46) confirm that team interaction and communications that occur in the relationship among members enhance the team's capability for developing new, team-level knowledge that is crucial to the project's success.

Elfenbein, cited by Stephens et al. (2019:862), states that emotions are one form of affective experience and refer to short-lived, intense feelings that can be linked to specific events such as anger and joy. According to Stephens et al. (2019:864), when teams have more information about each other's feelings and responses, team members can better cope with uncertainty, develop a better understanding of where each person is coming from, and thus build on each other's knowledge. Without expressing emotions to communicate the significance of ideas and events to others, team members will be without necessary information that may or may not require further management.

E. Team Alignment to Project Goals

Team alignment has been identified as an important criterion for a successful project team (Jorgensen 2018:799). Projects are often stressful and very closely monitored against their

milestones and budgets (Collier, 2009:17). This will arguably result in pressure to work effectively. In this setting, reaching decisions within the right time frame becomes very important, or the project could be jeopardised. According to Jorgensen (2018:800), members of a high-performance team are jointly responsible for the results and are evaluated for the team's total performance instead of individual work packages. This infers that project members discuss issues, provide input, and help each other as part of the work process. One primary purpose of interdisciplinary teams is the potential to enhance collective skills and their potential to provide a different perspective on ideas, problems, and solutions (Janis as cited by Jorgensen, 2018:801).

From psychology, we know that social groups highly affect us. Being aligned with a group, we feel comfortable and safe, and trust other members. This helps in fostering common goals. However, a certain level of disagreement and conflict is important to test ideas, discuss assumptions, different options and perspectives and make better decisions (Lincoln & Guba as cited by Jorgensen 2018:801).

3.2 Demotivation and Motivation Factors in Project Team Dynamics

3.2.1 Demotivation factors

3.2.1.1 Workplace Bullying

Einarsen, cited by Creasy et al. (2017:966), defined workplace bullying as harassing, offending, socially excluding someone or negatively affecting someone's work tasks. These acts must occur repeatedly and constitute systematic negative social acts to be classified as workplace bullying. Workplace bullying impedes organisational functioning, leading to individual, group and legal consequences (Creasy & Carnes 2017:964). Given the prevalence of project team collaboration, understanding team dynamics has become crucial for increasing the effectiveness of key project teams.

Past research on workplace bullying has shown far-reaching effects on the target, such as withdrawal, physical health, and suicidal ideation. It also produces adverse psychological outcomes for the bystanders (Nielsen & Notelaers 2015:284). In addition, past research

has shown that workplace bullying impacts important outcomes such as creativity, leadership, and communication in project teams.

3.2.1.2 Lack of Project Strategy and Direction

The project managers' environment is about planning, organising, motivating, and controlling resources and procedures to achieve specific goals (Vilhelmsdottir, Kristsansdottir & Ingason, 2015:279). The factors that project managers need to have in mind when planning a project are scope, time, budget, and quality. In the project management environment, the project and their scenarios differ between projects, and almost no task is the same. This call for project strategies to be unique to an individual project (Pinto & Slevin, as cited by Vilhelmsdottir et al. 2015:278-279).

The importance of having the project strategy or clearly defined goals and benefits from the beginning cannot be over-emphasised as it is important for the project teams to understand the goals and benefits for the whole organisation. According to Vilhelmsdottir et al. (2015:279), having a clear project strategy in place can help win the support of senior management responsible for allocating resources (finance, human resources and time). Project manager confidence increases with management support, leading to successful project completion. According to Pinto & Slevin, as cited by Vilhelmsdottir et al. (2015:279), a good project strategy can help with project schedules and planning. He added that having a detailed plan of the stages of implementation is vital for project success. The plan describes the milestones, resources and equipment needed for the project.

Steinthorsson, as cited by Vilhelmsdottir et al. (2015:270), states that a project strategy shows where to focus on the future and how to manage the project resources for better performance. A poor project strategy can negatively affect the project team dynamics and thus affect the successful completion of the project.

3.2.1.3 Lack of Cohesion Among Project Teams

On the knowledge base projects, like in electrical engineering industries, project managers tend to adopt a team-based work structure to improve project functioning and success. According to Loo R. (2003:18), industries realise that designing and managing teams that

work well together is a complex challenge as the project teams must develop and complete project tasks. Gelbard & Carmeli (2008:464) state that project team involvement and executive management support are the keys to a project's success. In addition, team dynamics and processes such as communication and collaboration are crucial to the success of projects.

Evidence indicates that most project teams often fail to share cognitive processes socially, that is, coordinate expertise, because, among other things, they are not successfully managing their collaborative processes effectively (Jarvis, Mackenzie & Podsakoff, 2003:46-47). Project success depends to a great extent on the effectiveness of the work teams assigned to the task can do. According to Gelbard et al. (2008:465), team effectiveness reflects their ability to

a. Produce outputs are often assessed by product quality, speed, and customer satisfaction.
b. Provide benefits to team members such as learning, knowledge and satisfaction.
c. Enhance the team's capability to accomplish future project tasks.

Janis, as cited by Gelbard et al. (2008:465), argues that team dynamics are critical for project success because these dynamics effectively exploit the cognitive arsenal of the group and can prevent groupthink; a situation where team members strive for unanimity at any cost, which unfortunately suppresses proper discussion and impedes a realistic appraisal of alternatives.

3.2.1.4 The Effect of Intellectual Property Rights Knowledge Sharing and Innovation in Project Team

Knowledge is a critical asset and an important source of innovation, and ensuring the integrity of the information becomes of paramount importance, especially in inter-organisational project teams (Biemans & Omta, 2009:842). Potentially, this can negatively impact knowledge sharing and collaboration, and the conditions for knowledge exchange become a significant challenge in managing innovations. According to Olaisen & Revang

(2017:584), one way to manage such conditions is by using Intellectual Property Rights (IPRs). He added that IPRs are often introduced to projects and specify the ownership of the valuable assets developed in the project or a critical technological process used in completing the project. Therefore, using IPRs can affect trust, attitudes, knowledge sharing and innovation in inter-organisational project teams.

Fong, as cited by Olaisen et al. (2017:584), states that three important factors promoting knowledge sharing in project teams are trust, commitment, and attitudes.

i. Mutual Trust and IPRs:

IPRs can have positive and adverse effects on knowledge sharing directly through their effect on the trust relationship. Where there is trust, the necessity to monitor the partners and collaborators is eliminated. It minimises safeguards such as comprehensive contracts (McNeish & Mann, 2010:42). Caution must thus be exercised to minimise the escalation in the use of contracts as the reduction of trust can be exacerbated, as the introduction of contracts can be seen as a signal of lacking trust and expectations of opportunistic behaviour (Kadefors, 2004:467). According to Olaisen et al. (2017:584), the IPRs will increase.

ii. The trust among the members of the inter-organisational project teams.
iii. The collaboration among the members of the inter-organisational project team.

3.2.1.5 Attitudes Towards Knowledge Sharing and IPRs

The sharing of knowledge cannot be made mandatory for project team members; willingness to share knowledge without coercion among the members becomes crucial to project success. According to Liu & Liu (2011:46), beliefs regarding the outcomes of the actions and an evaluation of these findings significantly influence attitudes toward knowledge sharing. Hence, employees evaluate the benefits and costs related to knowledge sharing. Olaisen et al. 2017:586 concluded by stating that:

i. IPRs will positively influence project members' attitudes toward knowledge sharing.
ii. Those with IPRs lean more towards the sharing of knowledge than those without IPRs

3.2.1.6 Commitment and IPRs

According to Olaisen et al. (2017:586), a significant positive relationship exists between organisational commitment and knowledge sharing. Those that are committed engender beliefs that the organisation has the right to the information and knowledge one has created or acquired. Nonaka, as cited by Olaisen et al. (2017:586), states that commitment is one of the most critical components for promoting the creation of new knowledge and, thus, essential for successful inter-organisational projects.

Effective commitment implies that the members believe in the project and contribute to its success. On the other hand, cognitive commitment to the *project* and its aims is characterised by acceptance of the goals and values of the project and willingness to be engaged (Mowday, Streers & Porter as cited by Olaisen et al. 2017:586).

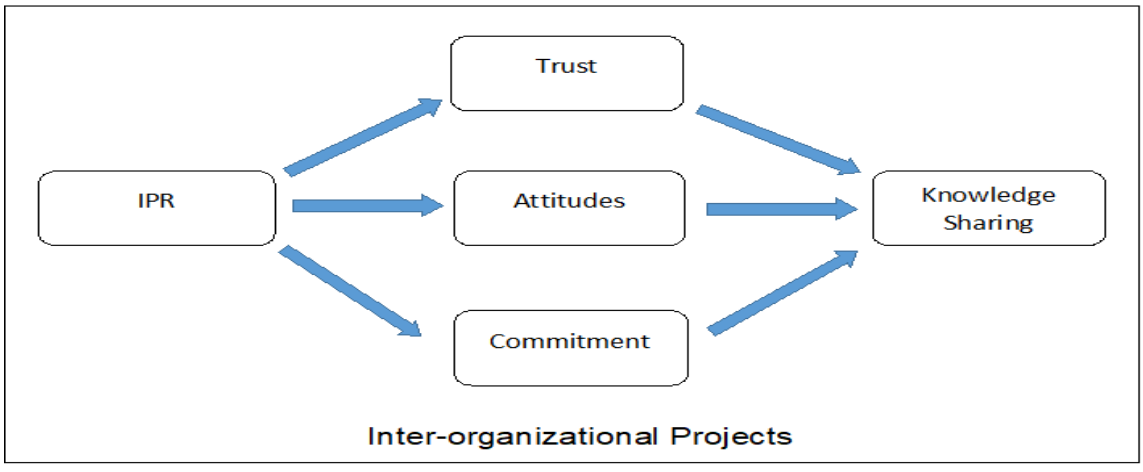


Figure 3.1: Conceptual framework: The relationships between IPR contracts and knowledge sharing in inter-organizational projects

Source: Olaisen et al. (2017:587)

Olaisen et al. (2017:591-592) highlight the following points which must be taken into consideration when using the IPRs to influence trust attitudes, commitment, knowledge sharing and innovation in inter-organisational projects.

i. IPRs must be planned and agreed upon before inter-organisational teamwork is started.
ii. IPRs are essential for building up trust in an inter-organisational team.
iii. IPRs are essential for knowledge sharing and knowledge integration in inter-organisational teams.
iv. IPRs promote innovativeness and incremental innovations in inter-organisational teams.
v. IPRs are not important for developing radical innovations and design processes.

3.3 Value Creation in Project Team Alliance

Project team alliance requires all to work together in good faith, share project risks and make unanimous decisions for the betterment of the project. According to Pargar, Kujala, Anttonen & Ruutu (2019:716), a vital feature of the successful implementation of a project alliance is a focus on value creation and value for money at the team level. Project management has traditionally focused on delivering output or products on time, within budget, and of a defined quality (Andersen 2008). However, this does not justify the resources deployed in project teams which can create conflicts. To increase our understanding of value creation processes in the concept of project team alliances, Pargar et al. (2019:717) state that it is essential to determine which mechanisms should be incorporated in managing a project team alliance to deliver more valuable outputs and avoid conflicts among teams. These mechanisms are social and environmental elements plus intangible deliverables, including, for example, quality of relationship, leadership, learning, reputation, and trust.

According to Walker & Lloyd-Walker (2015:46), alliancing and value creation is a collaborative project delivery arrangement that has been most extensively applied in many electrical engineering industries. Pargar et al. (2019:719-720) state that project alliance

and value creation are divided into three phases: selection, development and implementation. Figure 3.2 below illustrates the main tasks and outcomes of the different phases.

- **Phase one:** In the selection phase, the project manager and client form an alliance by selecting partners and project teams capable of working together, emphasising competence and technical capacity.
- **Phase two:** In the development phase, the alliance members work jointly under a common organisation to make decisions related to the project's overall scope and meet the client value for money criteria. This phase facilitated open knowledge sharing, brainstorming, innovation workshop and cooperative behaviours.
- **Phase three:** The implementation phase aligns the project team's behaviours toward achieving a project's key performance targets through an incentive scheme.

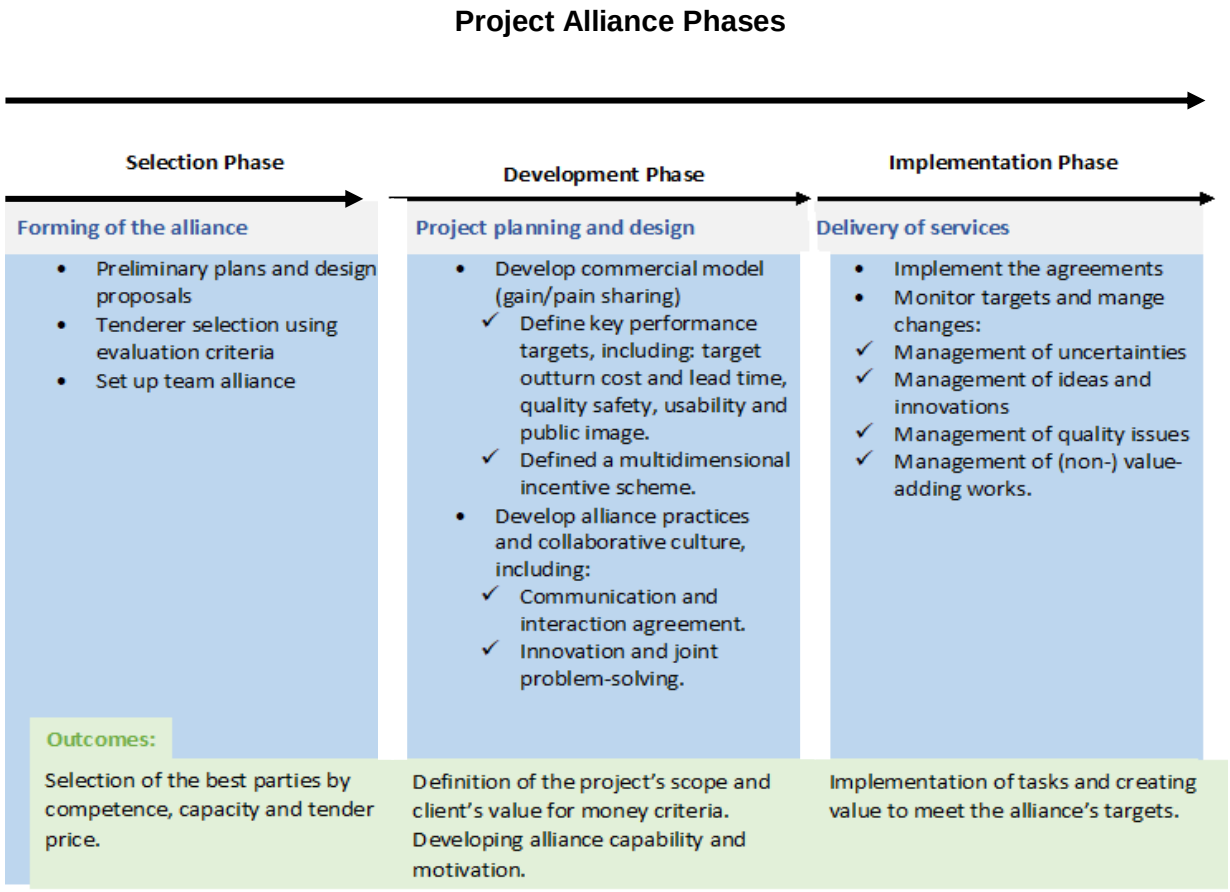


Figure 3.2: Main tasks and outcomes at different project teams' alliance phases

Source: Pargar et al. (2019:720)

3.4 Understanding the Motivator Factors in Project Team Dynamics: Using Maslow's hierarchy of (Personal) needs

Psychological research has produced many theories of human motivation, many of them tested empirically. However, one of the most popular theories in psychology, Maslow's Hierarchy of Needs (1943), has evoked much empirical study (Deci & Ryan, as cited by Neubauer & Martskvishvili, 2018:02). A great deal of research has been carried out to discover more about the way people behave—the aim being not only to explain their behaviour but, if possible, also to predict how people will react to a new situation (Allen,

Munoz & Ortuzar, 2019:76). For a project manager this is an essential consideration since the projects they manage are invariably and continuously being unique from one another.

According to Neubauer et al. (2018:02), behavioural scientists believe that individuals are motivated to act in a certain way by a desire to satisfy certain needs. One of the widely accepted notions about needs was developed by Abraham Maslow, who postulated that every individual has certain essential needs and that these needs arrange themselves in a hierarchical pattern. Maslow argues that when one need becomes primarily satisfied, the following need in the hierarchy will start to exert its motivating influence. At the bottom of the hierarchy are *physiological needs***.** These are the basic needs that must be met to sustain life itself. Therefore, satisfying one's physiological needs will be the primary concern of any person, and until one has done so, one will not be concerned with any other issues. However, once project team members feel reasonably sure of fulfilling their physiological needs, they will seek to satisfy the next need in the hierarchy, that of *security***.** Security means a feeling of protection against physical and psychological harm and security of employment. For project team members who have already satisfied their physiological and security needs, the next motivating factor is affiliation, which is wanting to belong to a group or an organisation and to associate with others. Next on the hierarchical scale is the *need to be recognised,* followed by the need for *fulfilment* (sometimes called "self-actualisation"). This last need expresses the desire of project team members to be allowed to show their talents.

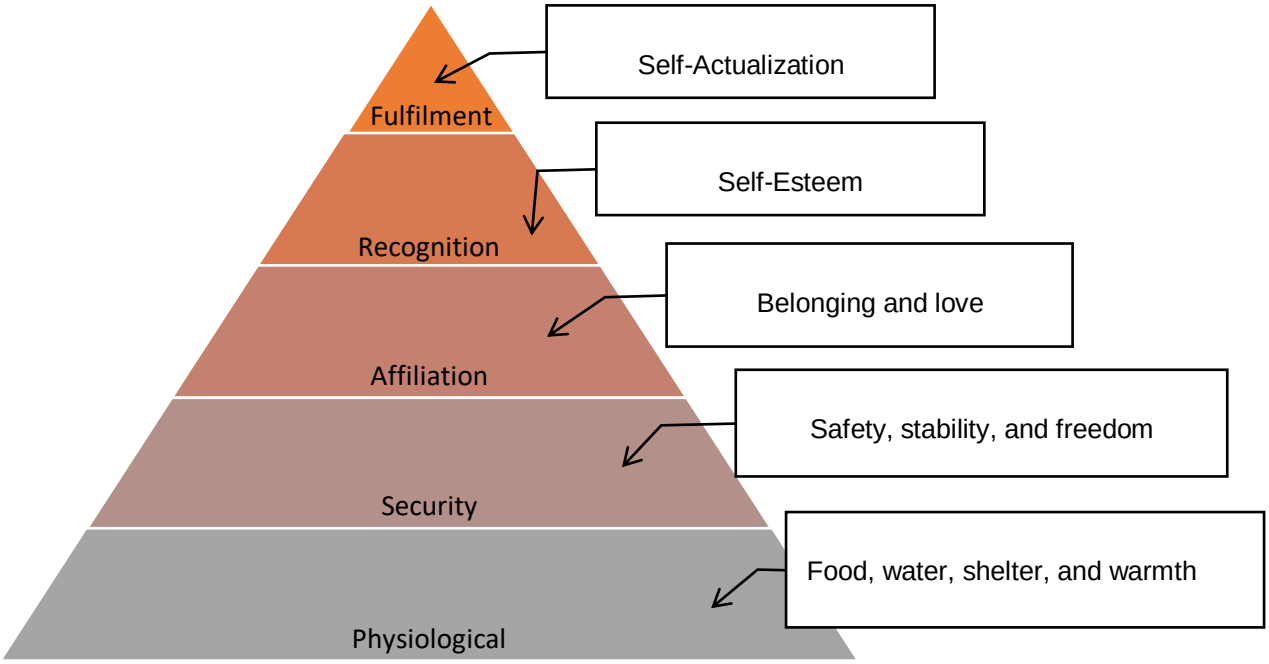


Figure 3.3: Maslow's hierarchy of needs

Source: Neubauer et al. 2018:03

In practice, most people satisfy some of these needs in part and are left with some that are unsatisfied. In developing countries, people are probably preoccupied more with their basic needs. In developed countries, on the other hand, where physiological and security needs are typically met, people seem motivated more by needs at the upper end of the hierarchy. According to Haier (2017:456), one of the interesting results of the research carried out in this area, which should be of concern, is the discovery that to satisfy affiliation needs, workers associate with each other to form various types of informal groups. Thus, a worker is usually a member of a project task group; a group or project team composed of workers performing a common task.

He or she may also be a member of various other groups, such as a friendship group composed of fellow workers with whom he or she has something in common or with whom he or she would like to associate. This means that every organisation has a formal and

informal structure (Deary, 2012:45). The formal structure is defined by management in terms of authority relationships. Similarly, there also exists an informal organisation composed of a significant number of informal groups with their own goals and activities that bear the sentiments of their members. Each group, it was found, expects its members to conform to a certain standard of behaviour since, otherwise, the group cannot achieve its goal, whether this is accomplishing a task or providing a means for friendly interaction. It was found, for example, that a task group tends to establish a quota for production among its members, which may or may not be in line with what a supervisor or manager wants.

3.4.1.1 Linking Maslow's hierarchy of needs to two basic human abilities; Intelligence and Creativity

Intelligence refers to the ability to reason deductively or inductively, think abstractly, use analogies, synthesise information, and apply it to new domains (Neisser et al., 1996:67). Moreover, intelligence is considered a polygenic, fitness-related trait that should have evolved to solve adaptive problems like survival and reproduction (Chiappe & MacDonald, 2005:14-20). Therefore, we argue that intelligence should help a project team member fulfil Maslow's basic hierarchy of human needs: physiological, relatedness and safety.

Creativity is the ability to produce work that is original, useful, and generative (Sternberg & Lubart, as cited by Neubauer et al., 2018:02-03). Moreover, it "leads us to change the way we think about things and is conceived as the driving force that moves civilisation forward" (Hennessey and Amabile, 2010:594). Creativity is considered important in project management tasks force of an industry and is considered a sign of mental health and emotional well-being (Conner et al., 2016:04). Also, to Maslow's hierarchy of needs, creativity serves higher needs such as Self Esteem and Self-Actualization.

Concludingly, an important conceptual difference between creativity and intelligence is that intelligence is mostly used to advance existing social agendas, whereas creative thinking often opposes those agendas and implies the proposition of new agendas. Therefore, human beings and societies need a balance between intelligence and creativity, the old and the new, to achieve stability and change within a societal context (Hennessey et al., 2010:601).

3.4.1.2 Applying Maslow's hierarchy of needs to Project Performance

Meeting the customer's needs is essential in project delivery. Therefore, project managers must consider personal motivations in project management decision-making. The authors consider that Maslow's theory on the hierarchy of needs is applicable in explaining project staff's motivations in project performance. According to Zavei & Mahmud (2012:312), providing a suitable working environment is made possible by meeting project staff's preferences, even more so when they are allowed to personalise their working environment while keeping to safety standards. Disconnection between project staff and project managers has been regarded as a dimension of the modern era that has also led to the lack of attention given to traditional know-how by project teams and its associated skills and innovations (Oliver, 2006:412). The most important consequence of this phenomenon is the poor level of attention given to project teams' motivational factors in designing the built environment, which negatively affects project team performance.

3.5 The Impact of Human Relations on Project Team Loyalty

3.5.1 Job Satisfaction and proactive employee personality

Several studies have revealed that employees show the best job performance in challenging, resourceful work environments, as such environments facilitate their work engagement (Demerouti & Cropanzano, 2010:467). This implies that project managers should offer their employees sufficient job resources, including feedback, social support, and skill variety. In addition, research suggests that management can influence employees' job demands, resources and loyalty (Nielsen et al., 2008:20) and may indirectly influence employee engagement and performance (Harter as cited by Arnold, Tims & Daantje 2012:1360).

However, it may be equally important that project team members mobilise their job challenges and resources. According to Arnold et al. (2012:1360), managers are not always available for feedback, and organisations confronted with economic turmoil may set other priorities. Under such conditions, it may be necessary for project team members to show proactive behaviour and optimise their work environment. In this research, we

examine the role of proactive personality in predicting engagement and (other ratings of) job performance. We expect that project team members with proactive personalities are most likely to craft their jobs to stay engaged, loyal and perform well.

3.5.2 Job crafting and work engagement

Parker and Ohly (2008:235) have argued that project team members may actively change the design of their jobs by choosing tasks, negotiating different job content, and assigning meaning to their tasks or jobs. This process of project team members shaping their jobs has been referred to as job crafting (Arnold et al., 2012:1363). Job crafting has been defined as the physical and cognitive changes individuals make in their tasks or relational boundaries. Wrzesniewski and Dutton, as cited by Arnold et al. (2012:1364), state that job crafting is restricted to those changes that project team members may make in their specific work tasks, relationships at work, and cognitions about work. However, some recent studies have suggested that job crafting may take other forms. Accordingly, job crafting is defined as the changes project team members may make regarding their job demands and job resources. Based on these theories, we expect that project team members with proactive personalities are most likely to ask for help and feedback (social resources) and to proactively enrich their work environment, e.g., ask for autonomy, create skill variety, and follow training (structural resources).

Work engagement is defined as a positive, fulfilling, work-related state of mind characterised by vigour, dedication, and absorption (Schaufeli, as cited by Arnold et al., 2012:1364). In essence, work engagement captures how workers experience their work: as stimulating and energetic and something to which they want to devote time and effort (the vigour component); as a significant pursuit (dedication); and as engrossing and something on which they are entirely concentrated (absorption: Bakker & Demerouti, 2008:212). Qualitative research has revealed that engaged employees are highly energetic, self-efficacious individuals who exercise influence over events that affect their lives (Schaufeli, as cited by Arnold et al., 2012:1364). Job resources, such as feedback, social support, and skill variety, are assumed to play an extrinsic motivational role. However, they are instrumental in achieving work goals or have an intrinsic motivational role because they foster employees' growth, learning, and development.

3.5.3 Work engagement and performance

There are several reasons engaged workers perform better than non-engaged workers (Demerouti & Cropanzano, 2010:155), but one of the most convincing arguments is that engaged project team members often experience positive emotions, including happiness, joy, and enthusiasm. Positive emotions seem to broaden people's thought−action repertoires, implying that they build a variety of personal resources (Fredrickson, as cited by Arnold et al., 2012:1365). According to Arnold et al. (2012:1365), these resources may include physical resources (e.g., physical skills, health), social resources (e.g., friendships, social support networks), intellectual resources (e.g., knowledge, executive control), or psychological resources (e.g., self-efficacy, optimism). These personal resources can be used to cope with the project demands and to perform well. Furthermore, Demerouti et al. (2010:156) claimed that several studies show that a positive relationship between project team members' engagement and project performance is increasing. For example, project supervisors and their closest co-workers in electrical engineering industries agree that work engagement uniquely contributes to explaining variance in project performance.

3.5.4 Application of interpersonal Skills by Project Manager to influence work loyalty

Supervisory project management personnel are in a pivotal position to influence employee behaviour. It is no exaggeration to say that the project team leader and project managers are the spokespersons for the organisation. Their philosophy, competence, and leadership style establish the organisation's image in employees' eyes. As a result, each employee develops certain perceptions about the organisation's concern for his or her welfare. These perceptions, in turn, influence such essential factors as productivity, customer relations, safety consciousness, and loyalty to the firm.

Some project managers do not believe that total person development, such as job enrichment, motivation techniques, or career development strategies, helps increase productivity or strengthen worker commitment to the project. It is true that when such practices are tried without total commitment or full management support, there is a good chance they will fail. Such failures often have a demoralising effect on employees and management alike. A basic assumption of this book is that human relations when applied

in a positive and supportive environment, can help individuals achieve greater personal satisfaction from their careers and help increase an organisation's productivity and efficiency.

There are six major forces that influence human behaviour in a variety of work settings. An understanding of human behaviour at work begins with a review of these forces that affect every employee, regardless of the size of the organisation. As Figure 3.4 below, these are organisational culture, supervisory-management influence, workgroup influence, job influence, personal characteristics of the worker, and family influence.

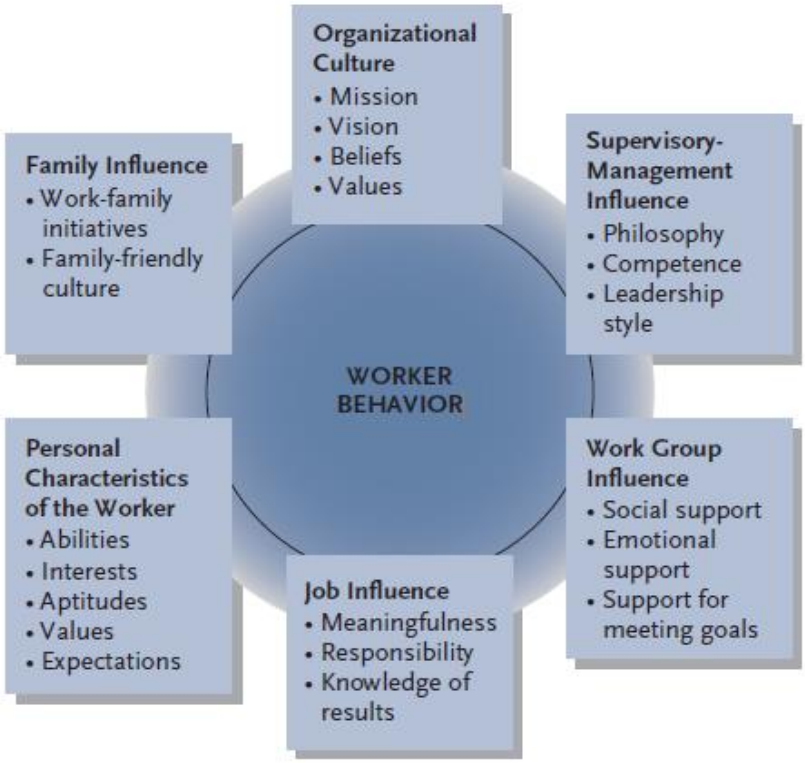


Figure 3.4: Major Forces Influencing Worker Behaviour

3.6 The Control of Project Team Members

Control is pervasive in electrical engineering project environments. Tuuli, Rowlinson & Yong (2010:180) state that the management of projects through various planning and control tools has therefore been described as bureaucratisation, which increases control over individuals, teams and organisations through ideologies of efficiency and performativity. However, certain characteristics of the project setting make it an ideal climate for empowering individuals and teams. Control is viewed as all devices and systems employed to ensure that acts, behaviours, outcomes and decisions of individuals, teams and organisations are consistent with meeting organisational or project goals, objectives, and strategies (Cicmil and Hodgson, 2006:115). While formal control remains the primary control mode, a portfolio of control appears necessary to augment the inadequacies of formal control due to the evolving nature of the project environment.

3.6.1 Development of a control framework for project teams

The organisation and management literature views control as encompassing all the devices and systems employed to ensure that the behaviour and decisions of organisational constituents are consistent with the organisation's goals, objectives, and strategies (Merchant & Stede, 2007:378-379). According to Ouchi, as cited by Tuuli et al. (2010:190), a prominent organising framework for the mechanisms (i.e. devices and systems) through which organisational control is exercised is divided into three control modes/types model, comprising market control, bureaucratic control and clan control.

I. In the market control mode, a premium is placed on the ability to precisely measure and reward individual contributors to a task as the means of control.
II. Bureaucratic control relies on surveillance and comparative evaluation, built on comparing outcomes or behaviours with predetermined ones.
III. Clan control relies on informal socialisation, such as shared values, beliefs, and norms, to eliminate goal incongruence.

Kirsch, as cited by Tuuli et al. (2010:190), dismissed market control as an inappropriate control mode in complex task contexts and proposed instead the addition of self-control, an appropriate mode of control when knowledge of a task is high. This view resonates with the notion that the electrical engineering industry is a knowledge- and professional-based industry, a characteristic which makes the project setting a suitable climate for empowerment (Greasley, Bryman, Price, Dainty & Soetanto, 2008:45-46). Kirsch, as cited by Tuuli et al. (2010:190), described self-control as the scenario where one sets his or her targets concerning the needs of the organisation or task, monitors his or her behaviours, and when necessary, changes them in accordance with the self-set or agreed targets.

Outcome-based and behaviour-based controls, the two modes of bureaucratic control, are viewed as formal controls which attempt to restrict behaviours or outcomes, while clan and self-control depict informal control modes which attempt to induce a value or belief change (Flamholtz as cited by Tuuli et al., 2010:191-192).

Table 3.1: Conceptual framework of control modes and control mechanisms

Characteristics	**Formal/bureaucratic control**		**Informal control**	
	Outcome-based	**Behaviour-based**	**Clan-based**	**Self-based**
Focus of control	Outcomes; results	Behaviour; actions	Values, beliefs	Self-regulation
Basis of control	Rules; surveillance	Rules; surveillance	Shared values, shared norms	Self-monitoring
Source of control	Organisation or external parties	Organisation or external parties	Group members, associations	Individuals, groups

Ideal conditions for use	Task outcomes are known and measurable; an explicit link exists between extrinsic rewards and producing outcomes	Knowledge of the transformation process; behaviour observable; explicit link between rewards and behaviours	Imperfect knowledge of the transformation process; immeasurable outputs; behaviour observable; rewards linked to values	Imperfect knowledge of the transformatio n process, immeasurable outputs, low behaviour observability
Examples of control mechanisms	Performance standards, targets	Codes of conduct, contracts, handbooks	Mission statement, core values, peer pressure, culture, norms	Autonomy, decision-making power, intrinsic motivation

Source: Tuuli et al. (2010:191)

Table 3.1 above summarises the key characteristics of the four control modes and provides an organising framework for studying control in project teams. Control in this context encompasses all the devices and systems employed. This ensures that acts, behaviours, outcomes and decisions of individuals, teams and organisations in a project are consistent with meeting organisational or project goals, objectives, and strategies (Nieminen & Lehtonen, 2008:69). Control viewed in this manner can be examined from different levels within the project context at inter-organisation and intra-organization levels. Interpolating an agency theory perspective into the electrical engineering industry project context, attempts by the principal (i.e., the client) to control the agent (i.e., contractors and consultants) are particularly pervasive. Controls that arise from this principal-agent relationship at the inter-organisational level often translate at the intra-organization level

between top managers and the individuals and teams they deploy at the project level and can often be a direct reaction to the inter-organisation level controls (Tuuli et al. 2010:191).

3.6.1.1 The Ability to draw contingency between project team members and the team leader

The past decade has seen a dramatic increase in the application of work teams in organisations (Devine as cited by Jun, Xiaoyu & Xianju, 2012:283). Innovation is critical for teams to maintain and enhance effectiveness within this rapidly changing and challenging business environment. Although teams often have leaders who play an essential role in ensuring team effectiveness, the relationship between leadership and team innovation in work settings is very important. Transformational leadership is a central theme in many innovative industries in South Africa today, yet the role of a transformational leader in team innovation is largely ignored. In addition, as cited by Jun et al. (2011:283), Waldman argued that transformational leadership represents an active form of strategic leadership that is an essential ingredient for organisational effectiveness.

The contingency perspective of leadership suggests that leadership is a social construct that cannot be fully understood when examined in isolation from the context in which it occurs (Yammarino, Spangler & Dubinsky, 2018:30). Bass, as cited by Jun et al. (2011:284) also asserted that certain contextual factors might moderate the impact of leadership style on followers' performance. By integrating the contingency perspective, we identify emotional labour – a job characteristic – as a critical boundary condition and examine its moderating effect on the relationship between transformational leadership and team innovation.

3.7 The Virtue of Humility

Calls for leader humility have intensified in the wake of corporate scandals attributed to the unbridled ego, hubris, sense of entitlement, and self-importance of the corporate executives involved and because leader arrogance and narcissism have been identified as reasons why leaders make bad decisions (Chatterjee & Hambrick, 2007:359). In addition, as organisational environments become more dynamic, uncertain, and

unpredictable, it becomes increasingly difficult for anyone leader to "figure it all out at the top," thus, emphasis has shifted to leaders engaging in more "bottom up," humble approaches to leadership (Kerfoot, as cited by Owens & Hekman: 2012). Thus, the term "humble leadership" literally means "leading from the ground" or "bottom-up leadership."

Humility has been identified as one of the core organisational virtues proposed to provide the foundation for moral action in the workplace and to foster positively deviant behaviour (i.e., exceptional performance, altruistic/prosocial behaviour (Cameron & Caza, 2004:758). Virtues connote "moral strength, valour, excellence, and worth", and in the context of organisations, virtues such as humility have been generally viewed as good, human, and produce social betterment (Bright, Cameron, & Caza, 2006: 251).

Humility has been identified as a "meta-virtue" that is foundational to other virtues such as forgiveness, courage, wisdom, and compassion (Grenberg, 2005: 133). In addition, humility may be foundational to other positive characteristics because, as a "temperance virtue" that guards against excess and it may temper other virtues, keeping them within the Aristotelian "golden mean". Though some view humility as low self-esteem or an inferior sense of worth or importance—a view that has led at least one prominent philosopher to question humility's worthiness to be called a virtue (Hume, as cited by Owens et al. 2012: 799), this conception fails to capture the historically held view of humility as a "classical source of strength" that captures a person's proper self-perspective.

3.7.1 Humility in Leadership

Increasingly, scholars and practitioners have argued the need for today's (and especially tomorrow's) leaders to approach their roles more humbly (Morris as cited by Owens et al.2012:799). For example, owing to increasing general workplace complexity and requirements for adaptability, recent leadership theories have begun to emphasise the bottom-up aspects of leadership. Some even argue for a need to change "the very idea of leadership—what it is and how it works and even how people even know it when they see it" (Owens et al. 2012: 824). In addition, researchers have suggested that leaders should move beyond the hero myth or "great man" perspectives on leadership (Murrell, as cited by Owens et al. 2012:824), show their humanness by being open about their limitations in

knowledge and experience, and focus more on how followers influence the process of leadership.

Leadership writers have increasingly homed in on the virtue of humility as being at the core of many of these bottom-up approaches to leadership (Matteson & Irving, 2006:45). More recently, many fields have called for professionals and leaders to approach their roles with more humility. For example, in electrical engineering industries, competence and humility are the two essential dimensions of engineering professionalism (Butler, as cited by Owens et al., 2012:825). In the management literature, most of the discussion of humility has also been in the context of leadership. Although many leadership writers have argued that leader humility is essential to organisational growth and survival, it is not clear what leader humility is, what it produces, and what influences its effectiveness (e.g., Greenleaf & Spears, as cited by Owens et al. 2012:825).

In existing perspectives on humble leadership, humility is mainly an innate virtue or stable personality trait rather than a set of behaviours that leaders can enact. For instance, some writers have suggested that leader humility involves self-awareness, openness to new ideas, and the tendency to look past or "transcend" oneself (Morris & Urbanski, 2005:1340). Similarly, others have argued that humility entails a willingness to understand the self (strengths and weaknesses) and an orientation toward others more than the self (Nielsen, Marrone, & Slay, 2010:37). In the servant leadership perspective, leader humility involves the "ability to learn from and gratefully receive the gifts of the less powerful" (Greenleaf & Spears, 2002: 320), and the leadership perspective suggests that leader humility involves a lack of charisma, a sense of calmness and quietness, and a baseline assumption that success comes in part from being humble to your fellow teammates.

CHAPTER 4
RESEARCH METHODS

4.1 Introduction

The discussion of team project management enhancing, demotivator and motivator factors in team dynamics, the impact of human relations on work loyalty, the control of team members and the ability to draw contingency between team members and team leader were discussed in chapter three. The chosen research design and methodology that will support the research objectives and answer the research question is dealt with in this chapter

According to Watkins (2012:40), the concept of "research design and methodology" includes critical aspects of "data collection design and methodology" here, the author will state which research type this research will follow and why that research type was selected. This is supported by Jowah (2011:42), who stated that each research effort is unique to its own circumstances. He argues that many different factors are involved. Some of these factors contributing to the uniqueness of the project are:

1. The type of population to be studied (Objects, animals or people)
2. What is to be studied (is it relationship or attitudes), and
3. How will the research be conducted (interviews or observations)?
4. What is the intended use of the research findings?

Of the six different types of research stated by Collis & Hussey, as cited by Watkins (2012:4-7), the author decided that this research shall be quantitative. Therefore, a detailed explanation of quantitative research is given below.

4.2 Types of Research Method

There are various types of research methods Collis & Hussey, as cited by Watkins (2012:4-7), discuss several of these concepts:

1. Exploratory research: This research is conducted into a research problem or issue when there are very few or no earlier studies to which one can refer for information about the issue or problem.
2. Descriptive research: This research refers to research which describes phenomena as they exist. It is used to identify and obtain information on the characteristics of a particular research problem, complex phenomenon issue, variables, or the causal link between the characteristics to be better explained.
3. Analytical (explanatory) research: This is a continuation of descriptive research, with the researcher going beyond describing the characteristics as in the instance of descriptive research and focusing on analysing and explaining 'why' and 'how' the phenomena being studied are happening. Analytical research aims to understand phenomena by discovering and measuring causal relationships. An important element of explanatory research is identifying and, possibly, controlling the variables or the causal links between the characteristics to be better explained.
4. Predictive research: This research goes further than analytical research and aims to generalise from the analysis by predicting certain phenomena based on hypothesised general relationships. For example, how would an increase in interest rate impact profit margins? More specifically, predictive research provides 'how', 'why' and 'where' answers to current and similar future events.
5. Quantitative research: This research involves collecting and analysing quantitative data and analysing such data using statistical methods. According to Jowah (2012:43), quantitative research considers an outsider perspective on quantifiable objective data, generally based on a hypothesis to be proved. He added that the population to be researched must be stabilised, and sometimes it is controlled by a set of standards used to measure the correctness of the findings. The research is very focused, and there is considerable emphasis on the reliability of the result; hence large numbers are used in the samples.
6. Qualitative research: This involves collecting and analysing qualitative data using interpretative methods. According to Jowah (2011:42-43), qualitative research is mainly done with human behaviour, which is not predictable and subject to change. Data is collected in the form of recorded words or video, which is sent for

analysis; it most likely will bring about different interpretations from the analysts. Variables may not be quantifiable in terms of their relationships to each other, limiting qualitative research in terms of hypothesis (Jowah, 2011:43). Qualitative research is subjective, explorative and is an insider's view of the human behaviour understudy. There is no stability, nor can controls be put in place. The population is dynamic and changes over time or according to the circumstances, conditions or even locations. Small samples are used to provide a holistic understanding of the phenomenon, but it may not be easy to repeat with the same results.

7. Applied research: Refers to research designed to apply its findings to solving a specific, existing problem. Applied research involves the application of existing knowledge to improve management practices and policies.

Table 4.1: Comparison of qualitative and quantitative research

Quantitative (Positivist Approach)	Qualitative (Anti-Positivist)
Focus on observable behaviour	Focus on laws of relationships
Focus on universal relationship laws	Focus on human experience
Focus on the causes of the phenomenon	Focus on the experience of phenomena
Uses the natural science model	Uses the experiential model
It is aided by firm checks and balances	Does not have firm checks and balances
Emphasis measurements and analysis	Emphasise investigating processes

Quantitative (Positivist Approach)	Qualitative (Anti-Positivist)
Have natural science build structures	Have a socially built nature of reality
Emphasises causal relationships and the variables	Focuses on the relationship of the object to the researcher
Ideal for objective data with numbers	Uses subjected data from opinions
Uses rigidly structured methods	Uses flexible exploratory methods
Tries to understand from outside	Tries to be involved with subjects
Need a static environment	Work with non-static realities
Uses of a particularistic approach	Uses a holistic (comprehensive data) approach
Uses large samples	Samples are small

Source: Jowah (2011:43)

4.3 Differences Between Research Design and Research Methods

From the definitions, we may be able to separate research design from research methodology, though erroneously, they have been used interchangeably (Jowah, 2011:102-103). However, research design and methodology include critical aspects of

data collection design and methodology. According to Watkins (2012:40), this process is often omitted in most research, creating a gap in the research strategy, ultimately culminating in extensive rework demanded by the researcher. To remedy this much-needed requirement and to expand on the essence of the issues of data collection design and methodology, it shall be viewed as part and parcel of the research process.

4.3.1 Research Design

According to Yin, as cited by Watkins (2012:40), a research design is a "logical sequence that connects the empirical data to a study's initial research question and ultimately to its conclusions. Colloquially, a research design is an action plan from getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions (answers) about these questions. Jowah (2011:102) defined research design as a blueprint or program of action showing the process that the researcher will use in response to a clearly stated problem and research question. This process clearly outlines what should be done and what stage or level, sometimes stating by whom it should be done. In addition, it talks about what techniques need to be used to achieve the intended goals and objectives.

The research design assists with, among other things, the allocation of resources and promote the making of crucial choices on what research designs will be appropriate for what research. Essentially it responds to the question, what? It is a strategic vision document which indicates where we are and where we want to be at the end of the research project. For example, the research designer may ask; Is an intensive study of a small group more effective for the required research (deciding on qualitative and quantitative? What kind of analysis will have the best results?

4.3.2 Research Methodology

The methodology explains how the techniques will be used to execute the research design stipulated in the master plan (Jowah, 2011:102). Alternatively, research methodology is the methodical execution or implementation of the research plan as in the research design. The questions to be answered are generally:

- How will we collect the data (interviews, observation, mailing, literature review)?
- Are the data collection methods to be structured, and to what extent (closed or open-ended questions, quantitative or qualitative research, who will ask the questions, what training is required)?

Table 4.2: Differences between research design and research methodology

Research Design	Research Methodology
Strategic master plan	Operational or execution plan
Emphasises the road to be walked	Emphasises how the walking is done
Emphasis on what results are expected	Emphasis on tools/techniques for results
Guided by the research problem/question	Guided by the tasks and work packages
Focuses on the rationality of research	Focuses on procedures and processes
Focuses on the "what should be done?"	Focuses on "how should it be done?"

Source (Jowah, 2011:103)

These phrases are used interchangeably in the research literature, but the difference must be made known, as shown in the table above. The research methodology is derived from the stipulation of the research design; in a sense, the research methodology is a part or

portion of the research design (Jowah, 2011:102). It is the research design in operation seeking to correctly implement the master plan to meet the desired objectives.

4.4 The Need for a Research Method

The research method is the manner or order in which we will conduct the data collection process. This is about the; how, where, and from whom? During the research process (the process of expanding existing knowledge, finding solutions to existing problems, or investigating phenomena), there is an order to be followed (Jowah, 2011:111-112). From this quest for knowledge or solutions is derived the research methodology, the general principles, and guidelines based on which we gather data and analyse it into knowledge. These are theoretical analyses of the method used to gather the necessary data for analysis and conclusions.

The research methodology through the selection of the appropriate methodology process describes;

- What must be done,
- How it will be done,
- What data is needed,
- What devices will be used to gather the data,
- How the data sources will be selected,
- And how the data will be analysed.

4.5 The Impact of Research Methods on Findings

There are different schools of thought about research and different research paradigms (Jowah, 2011:42). He added that these schools of thought hold different views about science and knowledge, as they were. The research method emphasises objectivity and reliability as critical elements of research and discourages any subjectivity in research (i.e., quantitative research). With a suitable research method, the researcher can repeat the research with the same results. In other research types, such as investigating or

phenomenological, the research is inevitably subjective since the researchers, as human beings, are part of the environment they are studying. Phenomenological research findings may not yield the same results if they are repeated, and this negatively impacts reliability (Jowah, 2011:42). The difference in the findings may be attributed to the difference in the observers and of cause the subjects of the study may not remain the same (i.e., qualitative research). This creates significant problems of subjectivity, but with a straightforward research method, the impact of subjectivity can be minimised.

The decision on what research method to use, qualitative or quantitative, is determined based on the research itself. The researcher needs to set the objectives clearly and decide on the type of results and how they can best be extracted from the population. Clarity about the research process and the design and methodologies to be used is of the essence in ensuring reliable findings.

4.6 The Population

According to Jowah (2011:123), the population is the complete set of units to be studied and analysed for an inference or conclusion to be reached. The population may be considered closed (finite) or exhaustive (infinite). The population has units, or it may be a unit from which the sample is drawn, or the study is to be conducted. Researchers should isolate or separate the element or unit of study from the population. Jowah (2011:123) characterised the population by:

- Refers to the study of objects, animals, and people
- The population should have researchable cases
- Must have all units of analysis necessary
- The units should be worthy of studying
- Must have clear researchable variables

A population consists of individuals, objects, groups of measurements or characteristics, depending on what is to be studied (Jowah, 2011:123). The population of this research shall be a collection of related units or elements with common variables that will be studied

together to draw conclusions. The research population of this study shall be employees in electrical engineering industries in Cape Town who have worked on projects in the past three months.

The population frame of this research is all the employees who have worked on a project in the electrical engineering industry during the past three months. However, the individual employees become the population elements who, when summed up, give us the total population.

4.7 The Sampling Methods Chosen and Reasons Why

According to Watkins (2012:63), citing Collis and Hussey (2009), a sample is part of the members of a population (the target population), the latter referring to a body of people or any other collection of items under consideration for the research. According to Jowah (2011:126), sampling is the process of identifying, selecting, and separating a representative part of the population of objects or individuals from which a survey will be conducted. Considering that the population to be studied is generally large and would take a long to go through studying, compounded by scarce resources, sampling is a better option.

The sampling methods may be random, systematic, stratified or cluster sapling (Jowah, 2011:126). Other forms of sampling he added were convenience sampling, purposive sampling, or snowball sampling. We will ensure that our sample is a true reflection or representative subset or portion (element) of the total population under investigation. For our research purposes, our sampling will have the following:

- Reflect the correct characteristics of the population
- Permit population generalisation of the findings
- Be representative of the population of interest
- Combine benefits of generalisation and cost savings

4.7.1 Sampling Techniques

Sampling is essential for research purposes and needs to be done correctly, as its implications are far-reaching (Jowah, 2011:130). Therefore, a few sampling methods are used in research and can be classified into two basic types: probability sampling and non-probability sampling.

4.7.1.1 Probability sampling

Each population element has an equal chance of being in this sampling technique. Or a known (nonzero) likelihood of getting selected, such as

- Simple random sampling.
- Systematic sampling.
- Sampling with probability proportional to population size.
- Stratified random sampling.
- Sub-sampling, multi-stage sampling.
- Cluster sampling.

4.7.1.2 Non-probability sampling

In this technique, not all elements have a likelihood of getting selected, and the results will most likely be biased. The sample is not as representative as:

- Incidental sampling
- Quota sampling
- Purposive samples
- Self-selection samples
- Convenience samples
- Snowball samples

4.7.1.3 Sample Method Chosen

The sampling method chosen for this research is simple random sampling which, according to Jowah (2011:131), is defined as a sampling technique whereby units or elements are drawn at random without regard to the characteristics of the population unit, and each element has an equal chance of getting selected. The reasons for choosing this method is because

- It is reasonably accurate.
- Done with or without replacement.
- The simplest form of sampling.
- It provides equal chances of selection of the units.
- It is easy and can be done without mistakes.

4.8 The Sampling Frame

There is a need to understand the population that is to be investigated. A sample frame is a physical representation of all the objects, individuals, and groups (Jowah, 2011:131). The sample frame of this research is

- Top managers (Directors).
- Project Managers.
- Supervisors or project team leaders.
- Employees from the shop floor or project team members.

4.8.1 Sample Size and Reasons

The larger the sample, the higher the possibility of getting the correct generalisations about a population (Jowah, 2011:129). In statistics, if the sample increases in size, it decreases the width of the confidence interval at a given confidence level. Using the laws of probability, we can have confidence in the accuracy of the results from a correctly drawn

sample. According to Jowah (2011:129), some basic factors necessary to determine the sample size are the population's heterogeneity, the extent of the permissible error, and the anticipated confidence levels. There will be a relationship between sample size and the population under study.

4.8.2 Establishing confidence levels

Let us toss five coins at a time and then record the number of times we have heads and the number of times we have tails for each of these five coins. Let us then repeat this operation 100 times. The results could be presented graphically as in Figure 4.1. However, if we considerably increase the number of tosses and, in each case, toss many coins at a time, we can obtain a smoother curve, such as that shown in Figure 4.2.

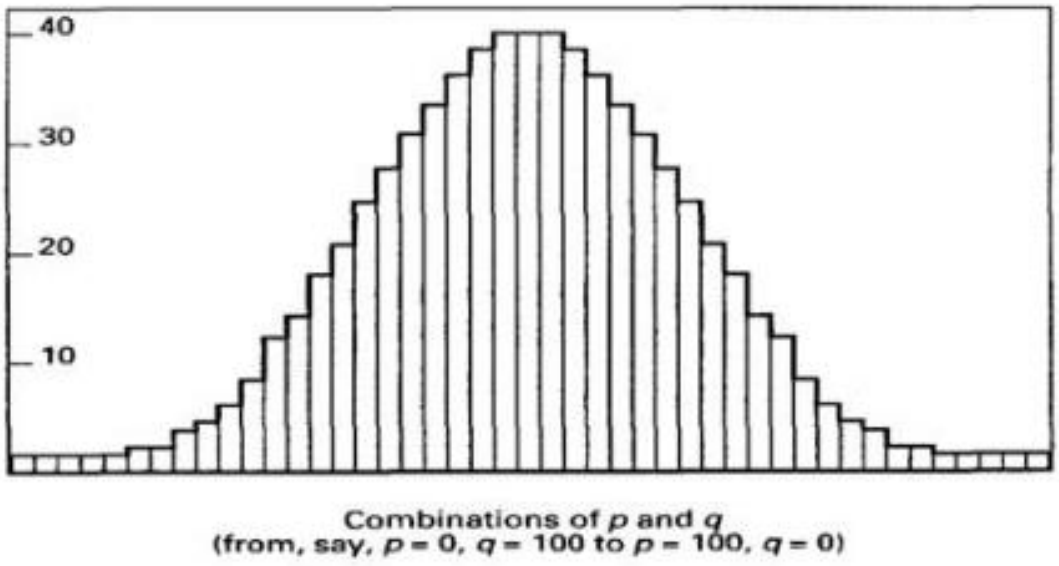


Figure 4.1: Curve of normal distribution (a)

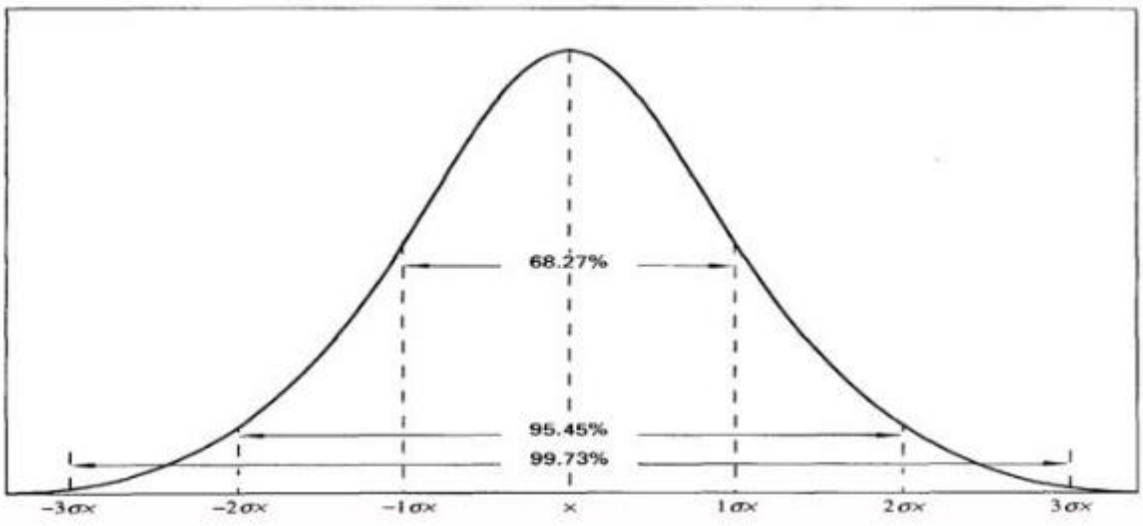


Figure 4.2: Curve of normal distribution (b)

This curve is called the curve of normal distribution. This curve tells us that, in most cases, the tendency is for the number of heads to equal the number of tails in any one series of tosses (when *p = q, the* number of tosses is a maximum). In a few cases, however, p is markedly different from *q* due to mere chance. Curves of normal distribution may be of many shapes. Since, in this case, we are dealing with a proportion, we use op to denote the standard error of the proportion.

The area under the curve of the normal distribution can be calculated. In figure 4.1(b), one σ_p on both sides of *x* gives an area of 68.27 per cent of the total area; two σ_p on both sides of x gives an area of 95.45 per cent and three σ_p on both sides of x gives an area of 99.73 per cent. We can put this in another way and say that, provided that we are not biased in our random sampling, 95.45 per cent of all our observations will fall within $x \pm 2\sigma_p$, and 99.73 per cent of all our observations will fall within $x \pm 3\sigma_p$. In this research, we can say that we will work with a confidence level of 95 per cent of the cases. Our observations will fall within $\pm 1.96\sigma_p$.

4.8.3 Determination of sample size

As well as defining the confidence level for the observations, we must decide on the margin of error we can allow for these observations. So, for example, we must be able to say that we are confident that 95 per cent of the time, this observation is correct within ±5 per cent of the time.

Let us now determine the sample size by distributing a few questionnaires at construction sites in Cape Town to determine the value of p and q. There are two methods of determining the sample size that would be appropriate in our case: the statistical method and the nomogram method.

4.8.3.1 Statistical method

The formula used in this method is:

$$\sigma_p = \sqrt{\frac{pq}{n}}$$

where

σ_p = standard error of proportion

p = percentage of employees responding to the questionnaire

q = percentage of employees not responding to the questionnaire

n = number of observations or sample size we wish to determine.

Before using this formula, we need at least an idea of the values *of p* and *q.* The first step is, therefore, to distribute questionnaires randomly at a construction site in Cape Town. Approximately 100 observations were made as a preliminary random study, showing employees not responding to the questionnaire in 40 per cent of the cases *(p* = 40) and employees responding to the questionnaire in 60 per cent of the time *(q* = 60). We thus

have approximate values for p and *q;* to determine the value of *n,* we must determine the value σ_p.

Since our confidence level is 95 per cent with a 5 per cent margin of error, we are confident that in 95 per cent of the cases, our estimates will be ± 5 per cent of the actual value.

At the 95 per cent confidence level:

If we reduce the margin of error to ± 5 per cent, we have

1.96 σ_p = 5

σ_p = 2.5 (approx.) 2.5

$$2.5 = \sqrt{\frac{40 \times 60}{n}}$$

$$n = \frac{40 \times 60}{(2.5)^2}$$

$$n = 384 \ \ observation.$$

In other words, if we reduce the margin of error by half, the sample size will have to be quadrupled.

4.8.3.2 Nomogram method

An easier way to ensure the sample size is accurate is by using the nomogram to read off the number of observations needed, such as the one reproduced in figure 4.2 below. Taking our initial study, we draw a line from the "percentage occurrence" ordinate *p* (in this case 25-75) to intercept the "error (accuracy required)" ordinate (say, 5 per cent) and extend it until it meets the "number of observations" ordinate n, which it intercepts at 384 for the 95 per cent confidence level. This is a speedy way of determining the sample size.

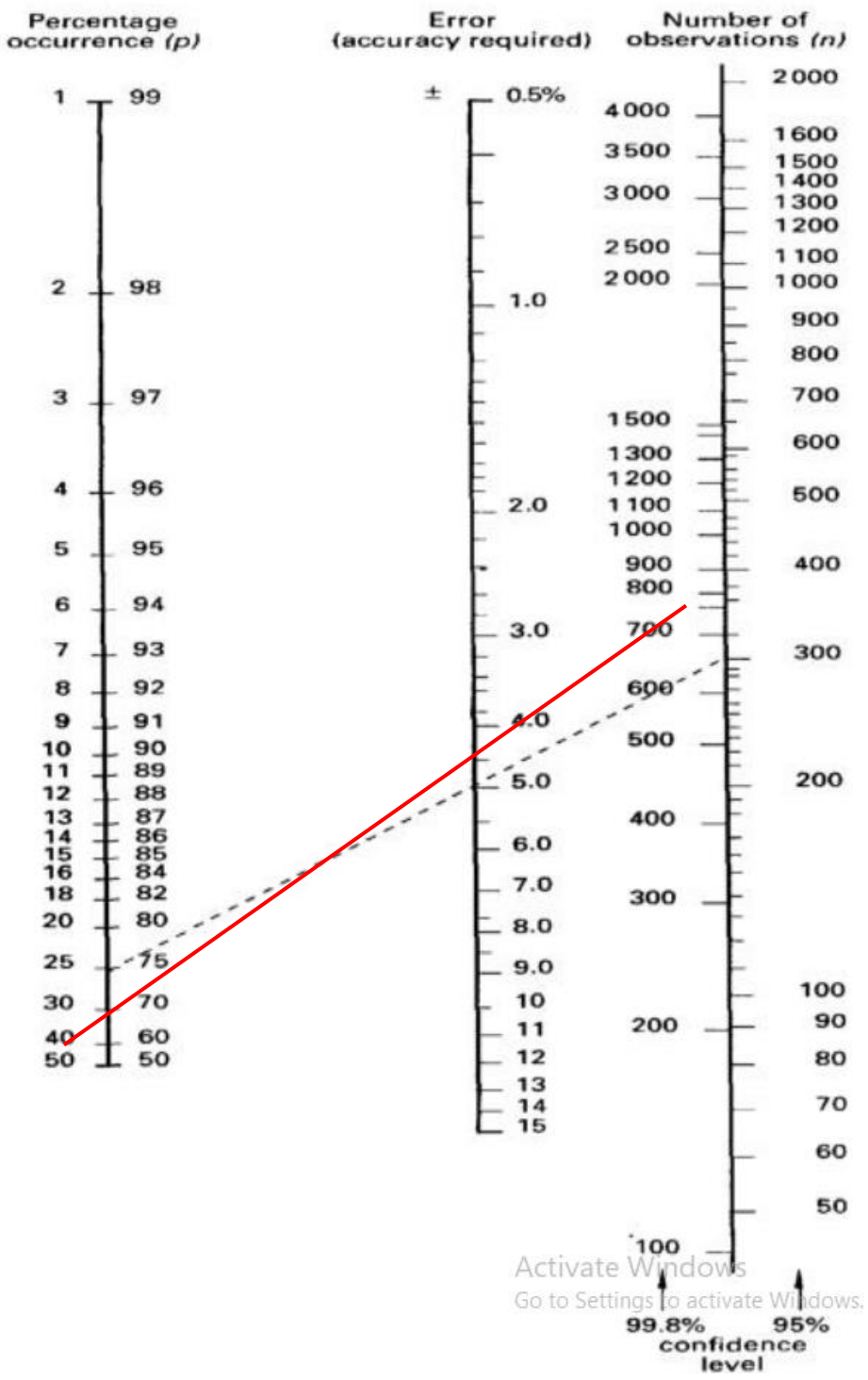


Figure 4.3: Nomogram

4.9 NomogramResearch Instruments and Reasons for Use

A questionnaire is one of the most widely used tools to collect data, especially in social science research. The main objective of a questionnaire in research is to obtain relevant information in the most reliable and valid manner. Thus, the accuracy and consistency of the survey/questionnaire form a significant aspect of the research methodology, which is known as validity and reliability. However, new researchers are often confused with the selection and proper validity type to test their research instrument (questionnaire/survey).

4.10 Inclusion and Exclusion Criteria

In this research, the author has included criteria which he has used as stated below:

- The entire population must be able to read and understand English.
- The entire population is working on a project in the construction industry.
- The population participating in this research will do so willingly and not forcefully.

For exclusion criteria, the reverse of the above inclusion criteria is true.

4.11 Ethical Considerations

Within a research context, Watkins states (2012:77-80), "ethics refers to the appropriateness of your behaviour about the rights of those who become the subject of your work or are affected by it". Therefore, based on the environment in which this research was conducted, the author considers the following ethical issues: protection from harm, informed consent, right to privacy and honesty with professional colleagues.

- Protection from Harm: The author ensures that the participants know about any form of psychological discomfort this report will bring and will recommend counselling immediately after their participation. For example, some participants may feel embarrassed or confused with the new production techniques the author recommends in this research.

- Informed Consent: The author informed all the participants in advance about the nature of the study to be conducted and made it clear to them that the choice of either participating or not participating lies with them. He also informs them of their rights to withdraw from the study at any time, as participation is strictly voluntary. Finally, the author presents an informed consent form to the participants that describe the nature of the research and the required participation. The author's informed consent form takes the format of the following points below, as stated by Leedy and Ormrod (2001:108):
    - A brief description of the nature of the study.
    - A description of what participants will be involved in regarding activities and duration.
    - A statement indicating that participation is voluntary and can be terminated at any time without penalty.
    - A list of potential risks or discomfort that participants may encounter.
    - The guarantee is that all responses will remain confidential and anonymous.
    - The researcher's name, plus information about how the researcher can be contacted.
    - An individual or office that participants can contact should they have questions or concerns about the study.
    - An offer to provide detailed information about the study (e.g., a summary of findings) upon its completion.
    - A place for participants to sign and date the consent form, indicating an agreement to participate.
- Right to Privacy: The author respects the participant's right to privacy by ensuring that the nature and quality of the participant's performance are strictly confidential.
- Honesty with Professional Colleagues: The author's findings in this study are complete and honest without misrepresenting what he has done or intentionally misleading others about the nature of his findings. The author has not, under any circumstances, fabricated data to support a particular conclusion, no matter how seemingly noble that conclusion may be.

4.12 Measurement Scales

The author will use the Likert scale measurement in this research whereby respondents are asked to respond to each of the statements in the questionnaire by choosing one of five agreement choices (Emory and Cooper, 1995:179). Typical agreement choices used in the Likert scale are depicted below, and the author will use them in this research.

Table 4.3: Likert Scale Measurement

Decision options	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
Code	**1**	**2**	**3**	**4**	**5**

Source: Adapted from Likert (1932:1-55)

This study will be using the popular Likert Scale because of the advantages as enumerated by Emory and Cooper (1995:180-181):

- Easy and quick to construct
- Each item meets an empirical test for discriminating ability
- The Likert scale is probably more reliable than the Thurston scale and provides more data than the Thurston differential scale.
- The Likert scale is also treated as an interval scale whereby the scale data can be analysed by virtually the full range of statistical procedures. In addition, the interval scales facilitate meaningful statistics when calculating means and standard deviation.

4.13 Survey Design

There are two approaches to structuring questions, namely positivity (structured closed-end questions) and phenomenological (unstructured, open-ended questions) (Ngetich, 2012: 15-16). The questionnaire framework of this research will attempt to address the impact of a project management style on project team performance in an Electrical Engineering Manufacturing Industries in Cape Town. The questions shall be split into four categories as follows:

1. To identify risks associated with management style.
    - How can project management techniques assist Electrical Engineering Manufacturing Industries in Cape Town in its quest to deliver projects on time, within cost and customer specifications?
2. To assess how projects align with an organisational strategic plan is being done.
    - How can a portfolio of projects be streamlined to ensure it supports organisational business strategy?
3. To identify the effect of organisational structure on management style.
    - What is Project Managers' reporting level in the organisation hierarchy chart at Electrical Engineering Manufacturing Industries in Cape Town?
4. To determine how management prioritised resources across different projects.
    - How do project team members feel reporting to the project manager and operation manager, and how is the working relationship between both managers?
5. To assess the impact of failed projects on the organisation.
    - What are the project success rates, and is there a cost value associated with the failed projects at Electrical Engineering Manufacturing Industries in Cape Town?
6. To identify the factors preventing successful project implementation.
    - What is the interest of senior management or project sponsors in project success?

4.14 Data Collection

Data collection is a systematic approach to gathering information from various sources to get a complete and accurate picture of an area of interest (Online: 2014). According to Jowah (2011:135), data collection is metaphorical pieces of information or facts collected through instruments, observation, standardised tests, instrument calibration, and laboratory tests. Data are characterised by their abstractness, ability to be verifiable, proximity to the phenomenon and elusiveness.

4.14.1 Research Questionnaire

According to Watkins (2012:155-156), citing Collis and Hussey (2009), a questionnaire collects primary data in which respondents are asked a list of carefully structured questions, chosen after considerable testing, to elicit reliable responses. Jowah (2011:149) defined a questionnaire as a set of questions used as an instrument to collect or gather information from a target population for the sake of researching to understand a phenomenon or relationship. These are the most common means of field research, where a predesign / structured set of questions are asked to the respondent.

This is a form or type of instrument used to gather the information that may be necessary for decision-making, confirmation of existing thoughts or other purposes. As a research instrument, a questionnaire has advantages over other forms of the information-gathering process for the sake of decision-making and other reasons. The questionnaires are:

- Cheaper to administer than other survey methods,
- Require less effort and management by the researcher,
- Are structured and ask the questions in a uniform pattern,
- The data is simpler to compile because of uniformity,
- Can be administered telephonically or online, or by email,

Questionnaires also have their shortcomings, such as:

- The uniformity of the questions frustrates some respondents,
- Some respondents may not be able to read or write for themselves,
- Can only be administered on human subjects, not other objects,
- Do not carter for other questions in the mind of the respondents.

The design of this research questionnaire will be split into three elements:

- Developing question content
- Design the question sequence and overall questionnaire layout
- Select the question type for each question and specify with wording

4.14.2 Collecting the Data

Data collection will take the form of questionnaires in survey form based on a random sampling approach. The sample size and sample type of this research shall be based on probability sampling, which according to Watkins (2012: 63-65), is a sampling technique where the researcher can in advance determine that each segment of the population will be represented in the sample.

4.15 Reliability And Validity

4.15.1 Validity

Data validity concerns the extent to which the research findings accurately represent what is happening (Collis and Hussey, 2009:204). According to Cooper and Schindler (2006:318-320), three major forms of validity can be identified: content validity, criterion-related validity, and construct validity.

The author will ensure validity by ensuring that this research answers the investigative questions and achieves the research objective.

4.15.2 Reliability

Data reliability, on the other hand, also referred to as trustworthiness, is concerned with the findings of the research (Collis & Hussey, 2009:64). Watkins (2012: 75) goes on to add that the findings can be said to be reliable if you or anyone else repeated the research and obtained the same result. According to Watkins (2012: 75), there are three common ways of estimating the reliability of the responses to questions in a questionnaire, namely, test re-test method, split-halves method, and internal consistency method.

The author will ensure reliability by ensuring that:

- The research population is adequately represented.
- The respondents understand the research objectives and are willing to participate in the research.
- Respondents are encouraged to give their honest opinion in the questionnaire.
- The project is referenced correctly.

4.16 Conclusion

The author is confident that the chronic causes of failed project implementation at Electrical Engineering Manufacturing Industries in Cape Town shall be identified and addressed using a questionnaire that considers the research sub-questions and objectives. It will provide a clear picture of some, if not all, challenges that have been confronting Electrical Engineering Manufacturing Industries in Cape Town to successfully implement a project to support their strategy and achieve competitive advantage.

The author will, in the next chapter, collect and analyse data from a sample group of employees drawn from Electrical Engineering Manufacturing Industries in Cape Town employees (i.e., population). From the data analysis, the author will come up with key findings, which will be why Electrical Engineering Manufacturing Industries in Cape Town are facing challenges in successfully completing projects.

This chapter provided details on the research methods, types of methods, differences between research design and research method, the need for a research method, the impact of the method on findings, the population, the sampling methods chosen, and reasons why, sample size and reason, research instrument and reason for use, data collection and analysis.

CHAPTER 5
DATA ANALYSIS AND INTERPRETATION

5.1 Introduction

According to Watkins (2012: 153-154), quality research data' forms the core of 'quality research. He added that quality research data, furthermore, is dependent on a specific area of research with the specific purpose of eliciting 'accurate' and 'relevant' data. For this reason, the author adequately addressed chapter four's research design and methodology. The author will state how data will be collected and subsequently analysed in this chapter.

According to Leedy & Ormrod (2001:196), analysis is when a researcher poses a series of questions to willing participants; summarises their responses with percentages, frequency counts, or more sophisticated statistical indexes; and then draws inferences about a particular population from the sample.

5.2 Method of Analysis

The author will pose a series of questions to willing participants; summarise their responses with percentages, frequency counts and more sophisticated statistical indexes like mean, median and standard deviation. Finally, the author will draw inferences about a particular population from the sample.

It is important for the author to state the data format of this research. The data format shall be based on the Likert scale, as explained in chapter 4, section 4.9.3.

5.2.1 Analysis

A total of 400 copies of questionnaires were distributed by the author as follows:

- 29 Top managers (Senior manager)
- 58 Managers (Project managers)
- 78 Supervisors (Team leaders)
- 235 employees from the shop floor (Team members).

The reason why the author distributed more questionnaires than the research sample size (i.e., 400 instead of 384 questionnaires which is the sample size at a 95% confidence level) was to make sure the returning number of the questionnaire was above the sample size was not everybody will complete the questionnaire on-time. Therefore, the author collected a total of 385 fully completed questionnaires as follows:

- 24 Top managers (Directors)
- 41 Managers
- 93 Supervisors
- 227 employees from the shop floor.

Fifteen respondents did not complete their questionnaires or hand them in on time. This was because of one of the following reasons:

- An employee was on leave
- An employee was moved to work at a different site.
- An employee was moved to other provincial branches to meet some critical deadlines.
- Employees did not want to be part of the research project.

5.3 Descriptive Statistics

According to Watkins (2012: 179-180), descriptive statistics describe the basic features of the data in the study. It provides summaries of the sample and the measures. With descriptive statistics, one is simply describing the information that was collected.

The author will use the most popular arithmetic calculations to interpret research data. They are mean, median, mode and standard deviation.

Mean – The mean is obtained arithmetically by adding all the scores in a sample and dividing it by the total number in the sample.

Median – Here, we arrange the sequence in ascending order, then:

- For an odd number of observations, the median = is the middle value in the array.
- For an even number of observations, the median = the mean of the two middle values.

Mode – The mode is the most frequent number in the distribution.

Standard deviation – The formula to determine the standard deviation is:

$$S^2 = \frac{\sum_{i=1}^{n}\left(x_i - \bar{x}\right)^2}{n-1}$$

Where $\Rightarrow$ x_i is the score of the i^{th} person, $\bar{x}$ is the arithmetic mean for the variable, and n is the number in the sample.

Table 5.1: Descriptive arithmetic calculation

Questionnaire Statements	Mean	Median	Mode	Standard Deviation
1. There are guidelines in place for just-in-time delivery.	19	6	-----	21.69
2. Pull-principle and Kanban are practised at Electro Inductive Industries.	19	10	1	20.89
3. Waste-reduction techniques like setup time reduction and Kaizen are practised at Electro Inductive Industries.	19	15	-----	17.10

Questionnaire Statements	Mean	Median	Mode	Standard Deviation
4. Our workstations are efficient and ergonomically designed.	19	12	-----	16.00
5. Our layout minimised waste of movement.	19	15	-----	16.42
6. Our layout minimised material and transformer parts search on the floor.	19	15	-----	9.33
7. Material flow in a logical and effective manner in our factory.	19	15	-----	12.71
8. Our layout provides for easy supervision of work by supervisors.	19	13	-----	14.70
9. Employees are knowledgeable and know their job.	19	16	-----	6.56
10. We are provided with training opportunities.	19	16	-----	12.61
11. We always received proper support on the floor from management.	19	12	-----	13.78
12. The right people are being sent for training.	19	15	-----	11.96

Questionnaire Statements	Mean	Median	Mode	Standard Deviation
13. Employees are motivated to do their work.	19	14	14	15.52
14. We assess our morale as a team.	19	10	-----	18.47
15. We measured and monitored our performance as a team.	19	6	-----	21.10
16. We set some performance targets and goals for our team.	19	12	----	15.52

Source: Own construction

5.4 Analysis of Data

The author gave the respondents a letter of consent which stated that participation in this research project was voluntary. He also explained to the respondent that there are no right or wrong answers to any items in the questionnaire. It is their opinion on each of the statements that matters. He also explained in the consent letter to respondents how the questionnaire was structured and how they should fill it in. The author concluded the letter by informing the respondents where to drop the questionnaire after completion.

5.4.1 Analysis of Part One of the Questionnaire

Question 1: What is your position in the organisation?

Of the 385 questionnaires received, 24 were from top managers, 41 from managers or project managers, 93 from Team leaders or Supervisors and 227 from team members.

Position	Number of Respodent	Percentage
Top Manager	24	6,23%
Project Manager	41	10,65%
Team Leader	93	24,16%
Team Member	227	58,96%
Total	**385**	**100,00%**

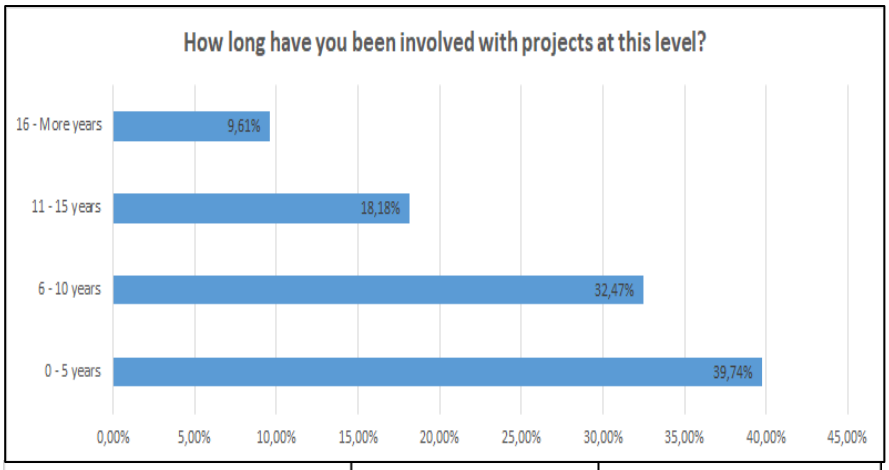
Figure 5.1: Position of participants in an organisation

Source: Own construction

The idea of giving questionnaires to every employee across all levels in an organisation was to study how employees at different levels perceived the impact of a project management style on project team performance in an electrical engineering manufacturing industry.

Question 2; How long have you been involved with projects at this level?

Of the 385 respondents who participated in the survey, 153 have been working on projects for five years or less. In addition, 125 employees have been working on projects for between ten and five years. Seventy employees have worked on projects between ten and fifteen years, and 37 have worked on projects for sixteen years or more.



Years	Number of Respodent	Percentage
0 - 5 years	153	39,74%
6 - 10 years	125	32,47%
11 - 15 years	70	18,18%
16 - More years	37	9,61%
Total	**385**	**100,00%**

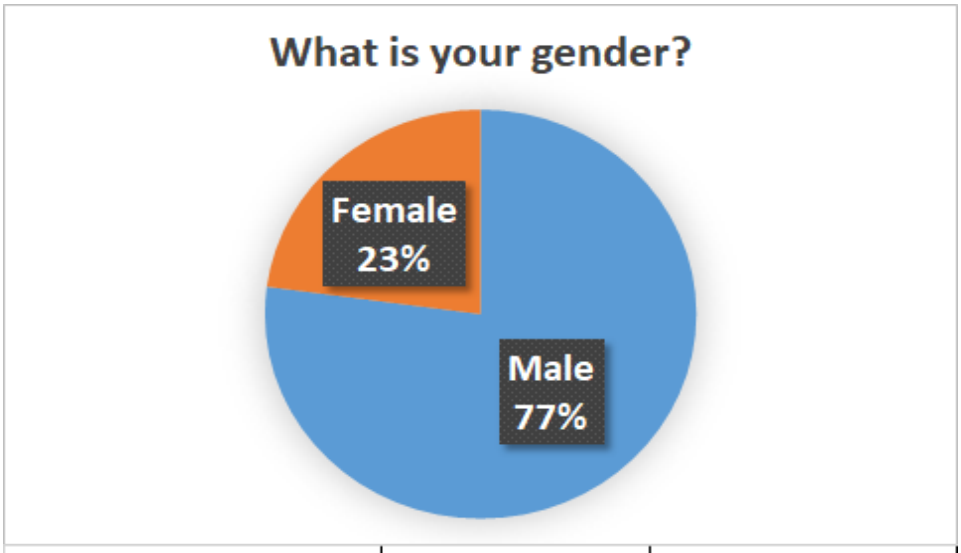
Figure 5.2: Years in projects of participants

Source: Own construction

From the above data, more than 70% of the respondents have worked on projects for more than five years. This will help ensure that the data we collect from them is reliable and accurate.

Question 3; What is your gender?

Of the 385 respondents who answered the questionnaire, 297 were male, and 88 were female. Again, this is an indication that engineering is still very much a male-dominated career.



Gender	Number of Respodent	Percentage
Male	297	77,14%
Female	88	22,86%
Total	**385**	**100,00%**

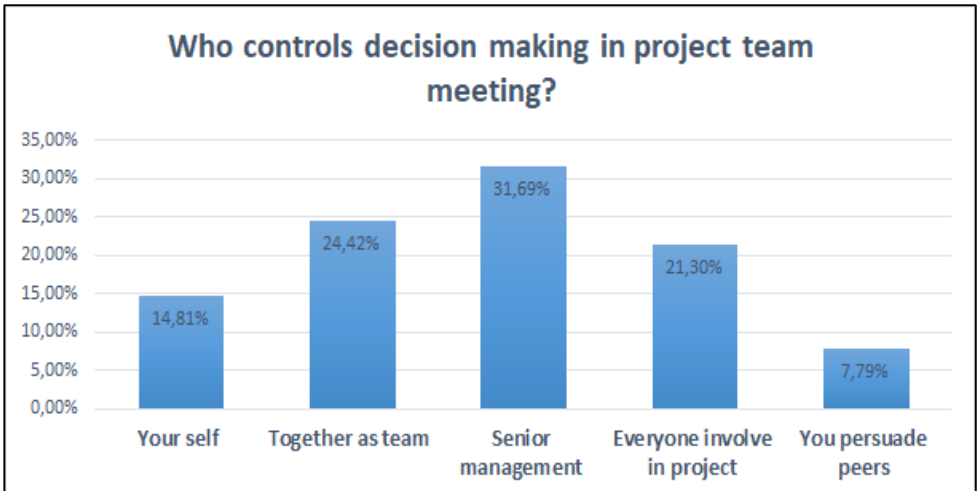
Figure 5.3: Gender of participants

Source: Own construction

The considerable gender gap will not impact the outcome of this study, given the fact that females were as qualified as males and good at what they were doing. However, this also highlights the fact that industry leaders and universities must do much to encourage women to consider engineering as a career.

Question 4; Who controls decision-making in a project team meeting?

Of the 385 respondents in this study, 31.69% thought that senior management controlled decision-making in the project team meeting. 24.42% thought that project team members themselves controlled decisions in project team meetings. 21.30% thought that everyone involved in the project controlled project team decisions. 14.81% of respondents thought everyone controlled the project team decisions, while 7.79% thought they had to persuade peers to control project team meeting decisions.



Decision Making Style	Number of Respodent	Percentage
Your self	57	14,81%
Together as team	94	24,42%
Senior management	122	31,69%
Everyone involve in project	82	21,30%
You persuade peers	30	7,79%
Total	**385**	**100,00%**

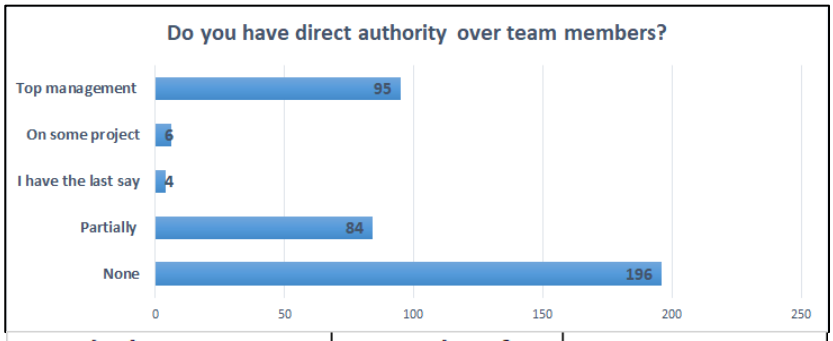
Figure 5.4: Decision-making in project team

Source: Own construction

It is disturbing that 31.69% of respondents thought that decision-making in project team meetings was controlled by senior management even though they do not attend their meetings daily. Furthermore, 24.42% of respondents thought everyone involved controlled the decision-making of the project team. This is not true, as the project manager or project coordinator must have a coordinated approach in steering the team toward a common goal. The team, under one vision and a common goal should be able to collectively as a team, agree and disagree on matters that affect them as a team. Project managers should play a more meaningful role in ensuring that project team members understand that in a team, decisions are collectively made by the project team guided by project vision and goals.

Question 5; Do you have direct authority over team members?

As seen in Figure 5.5 below, 50.91% of respondents do not know who has direct authority over team members, and this was followed by 24.68% of respondents who believed that top management has direct authority over team members. 21.83% of respondents believed they had partial authority over project team members. 1.56% and 1.04% of respondents believe they have authority in some projects and have the last say, respectively.



Authority Over Team member	Number of Respodent	Percentage
None	196	50,91%
Partially	84	21,82%
I have the last say	4	1,04%
On some project	6	1,56%
Top management	95	24,68%
Total	**385**	**100,00%**

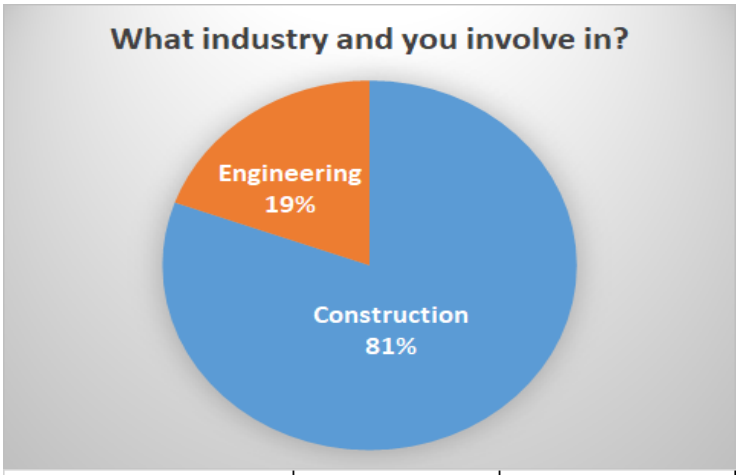
Figure 5.5: Authority over project team members

Source: Own construction

From the data collected, all project managers who participated in the research believe they only have partial authority over project team members. 50.91% of the respondents do not know who has authority over team members. This suggests that the organisation uses the matrix organisational structure where project team members have two or more lines of authority. In most instances, project team members tend not to know to whom they report. This has the following difficulties in that

- Project managers have some authority but are not in charge of the resources of a project.
- Major decisions still need to be made with the functional manager's cooperation or approval.

Question 6: What industry are you involved in?



What industry do you work for?	Number of Respodent	Percentage
Construction	310	80,52%
Engineering	75	19,48%
Manufacturing	0	0,00%
Service	0	0,00%
IT	0	0,00%
Total	**385**	**100,00%**

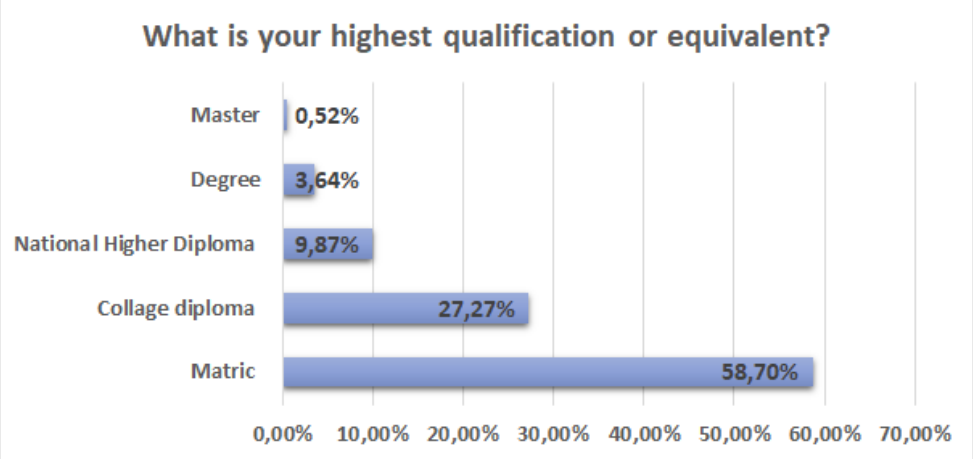
Figure 5.6: Authority over project team members

Source: Own Construction

The respondents' feedback showed that 80.52% were from construction, while 19.48% were electrical engineer contractors. However, they all work on projects and will provide us with an understanding of the effect of management style on the project team and project success.

Question 7; What is your highest qualification or equivalent?

As seen in Figure 5.7 below, 58.70% of respondents have matric, and 27.27% have a college diploma. In addition, 9.87% have a national higher diploma, 3.64% have degrees, and 0.52% have master's degrees.



What is your highest qualification?	Number of Respondent	Percentage
Matric	226	58,70%
Collage diploma	105	27,27%
National Higher Diploma	38	9,87%
Degree	14	3,64%
Master	2	0,52%
Total	**385**	**100,00%**

Figure 5.7: Project team member's qualification

Source: Own construction

Based on the above result, all the respondents are literate and can understand the questions asked in questionnaires without the help of an interpreter. This will improve the reliability of the results from this study.

Question 8; Are you involved in project selection and alignment of project to organisation strategy?

This question was designed to assess if project managers are involved in project selection and alignment if this was just done at a higher level, and what effect this has on project success. As seen in Figure 5.8 below, 32.21% of the respondent said they are not involved in project selection and alignment of project to organisation goals. 22.08% said they are partially involved in project selection and alignment of project to organisation goals. 6.75% said they are involved in project selection and alignment of project to organisation goals. 8.57% said all project staff are involved in project selection and alignment of project to organisation goals, while 30.39% said they are partially involved in project selection and alignment of project to organisation goals.

Are you involve in the selection and alignment of projects to organisation stratagy?	Number of Respondent	Percentage
No	124	32,21%
Partially	85	22,08%
Yes	26	6,75%
All project staff	33	8,57%
Only top management	117	30,39%
Total	**385**	**100,00%**

Figure 5.8: Involvement in selecting and aligning the project with organisation's strategy

Source: Own construction

From the questionnaire respondents, very few people are involved in project selection and alignment of project to organisation goals. Most of the project team is working on a project without knowing what the project objectives are. This can lead to resistance to change in areas where change is needed to accomplish project goals. It can even lead to a lack of commitment from project team members as they will see their project tasks as a job they are doing for top management.

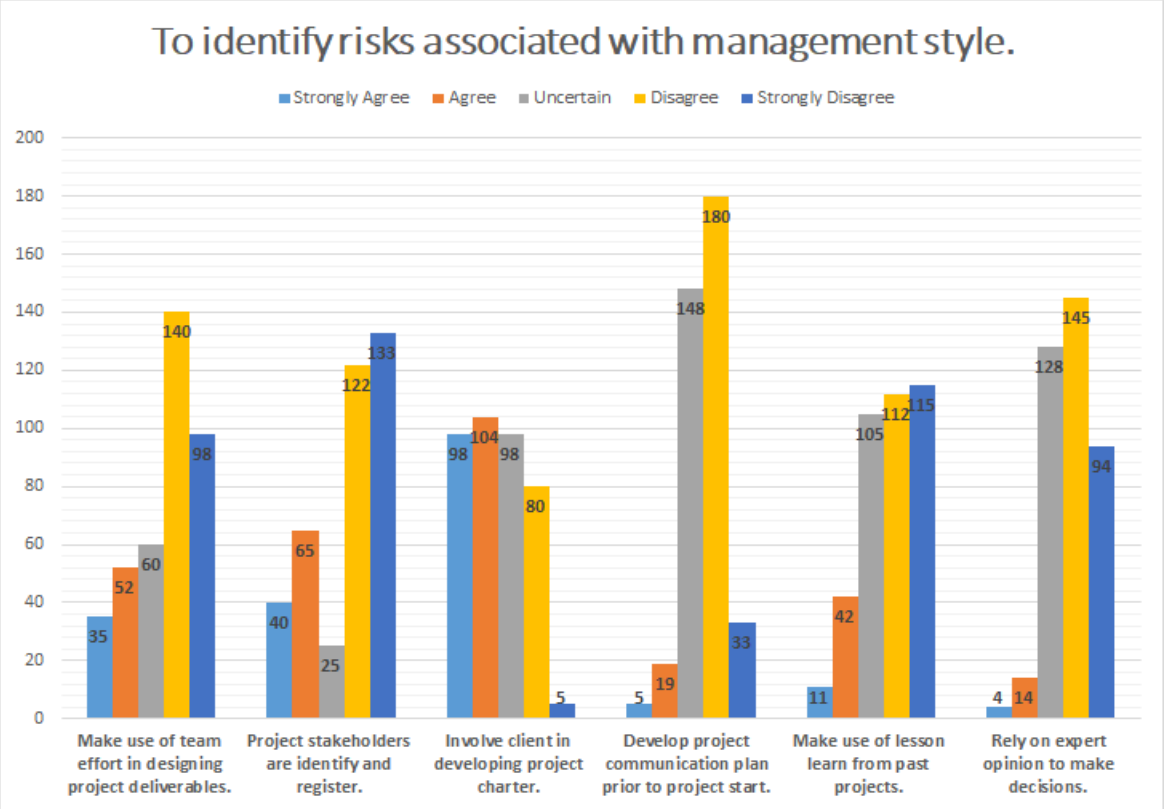
PART 2: Close-ended questions

Category 1: *To identify risks associated with a management style*

A vast majority of the respondents who took part in this survey do not seem to believe that project managers recognised the risk associated with their management style, which could either have a positive or negative effect on the project team, project deliverables and project completion date.

Of the 385 respondents participating in this survey, 9.1% strongly agreed that project managers use team effort in designing project deliverables, 13.5% agreed, 15.6% were uncertain, 36.4% disagreed, and 25.5% strongly disagreed. When asked if project

stakeholders are identified and registered? 10.4% strongly agree, 16.9% agree, 5.5% were uncertain, 31.7% disagree, and 34.5% strongly disagree. When asked if project managers involve the client in developing project charter? 25.5% strongly agree, 27.0% agree, 25.5% were uncertain, 20.8% disagree and 1.3% strongly disagree. 1.3% strongly agree, 4.9% agree, 38.4% are uncertain, 46.8% disagree, and 8.6% strongly disagree when asked if project communication is planned prior to the start of a project. Do project managers make use of lessons learned from past projects? 2.9% strongly agreed, 10.9% agreed, 27.3% were uncertain, 29.1.8% disagreed, and 8.6% strongly disagreed. When asked if project managers relied on expert opinion to make decisions, 1.0% strongly agreed, 3.6% agreed, 33.2% were uncertain, 37.7% disagreed, and 24.4% strongly disagreed.



Decision Options	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
Make use of team effort in designing project deliverables.	35	52	60	140	98
Project stakeholders are identify and register.	40	65	25	122	133
Involve client in developing project charter.	98	104	98	80	5
Develop project communication plan prior to project start.	5	19	148	180	33
Make use of lesson learn from past projects.	11	42	105	112	115
Rely on expert opinion to make decisions.	4	14	128	145	94

Figure 5.9: Identify risk associated with management style

Source: Own construction

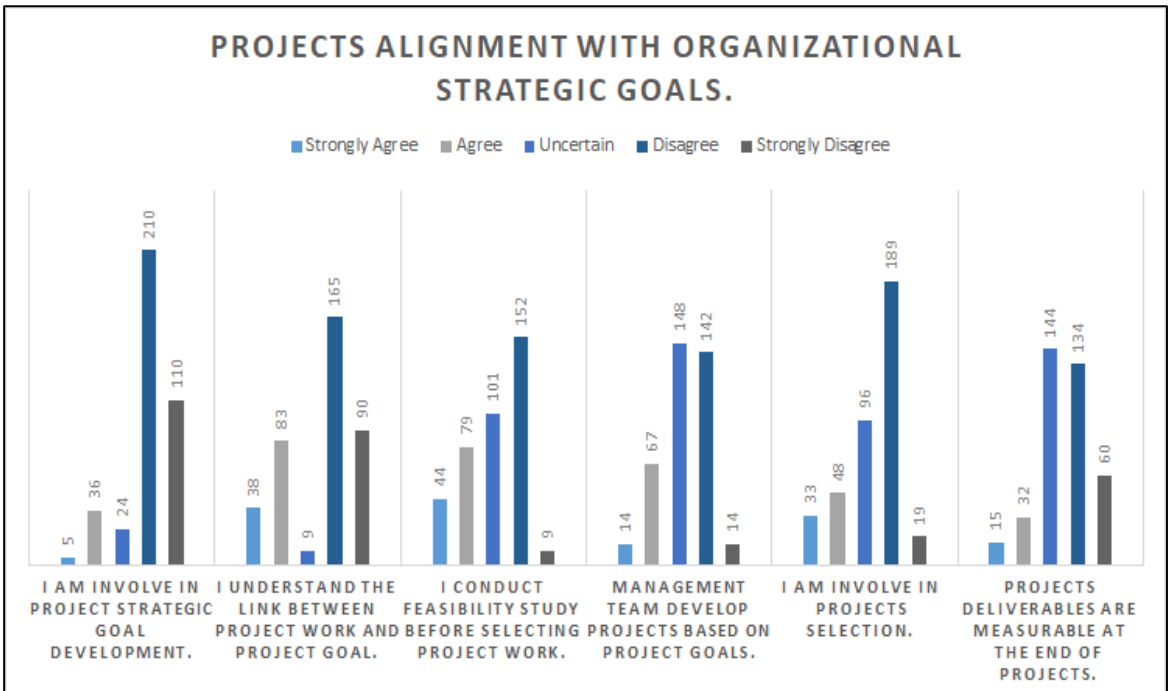
Besides involving clients when developing a project charter, most respondents seem to disagree or strongly disagree on points negatively associated with risk management style in managing a project. Such as;

- Make use of team effort in designing project deliverables.
- Project stakeholders are identified and register
- Developing project communication is planned prior to the project start
- Make use of lessons learned from past projects
- Rely on expert opinion to make decisions.

Category 2: *Projects alignment with organisational strategic goals*

Projects are born out of strategies, and these strategies have to align with organisational objectives in meeting the needs of its customers while remaining competitive. Suppose project managers fail to align project strategy to project objective; they may distribute resources to the wrong project while not getting the correct result. This may cause conflict between the different project groups, and the project will suffer.

Of the 385 respondents participating in this survey, 1.3% strongly agreed that they are involved in project strategic goal development, 9.4% agreed, 6.2% were uncertain, 54.5% disagreed, and 28.6% strongly disagreed. When asked if they understood the link between project strategy and project goal, 9.9% strongly agreed, 21.6% agreed, 2.3% were uncertain, 42.9% disagreed, and 23.4% strongly disagreed. I conduct a feasibility study before selecting project work. 11.4% strongly agreed, 20.5% agreed, 26.2% were uncertain, 39.5% disagreed, and 2.3% strongly disagreed. Do project managers develop projects based on project goals? 3.6% strongly agreed, 17.4% agreed, 38.4% were uncertain, 36.9% disagreed, and 3.6% strongly disagreed. When asked if respondents are involved in project selection? 8.6% strongly agreed, 12.5% agreed, 24.9% were uncertain, 49.1% disagreed, and 4.9% strongly disagreed. When asked if project deliverables are measurable at the end of projects, 3.9% strongly agreed, 8.3% agreed, 37.4% were uncertain, 34.8% disagreed, and 15.6% strongly disagreed.



Decision Options	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
I am involve in project strategic goal development.	5	36	24	210	110
I understand the link between project startegy and project goal.	38	83	9	165	90
I conduct feasibility study before selecting project work.	44	79	101	152	9
Management team develop projects based on project goals.	14	67	148	142	14
I am involve in projects selection.	33	48	96	189	19
Projects deliverables are measurable at the end of projects.	15	32	144	134	60

Figure 5.10: Projects aligned with the organisational strategic goal

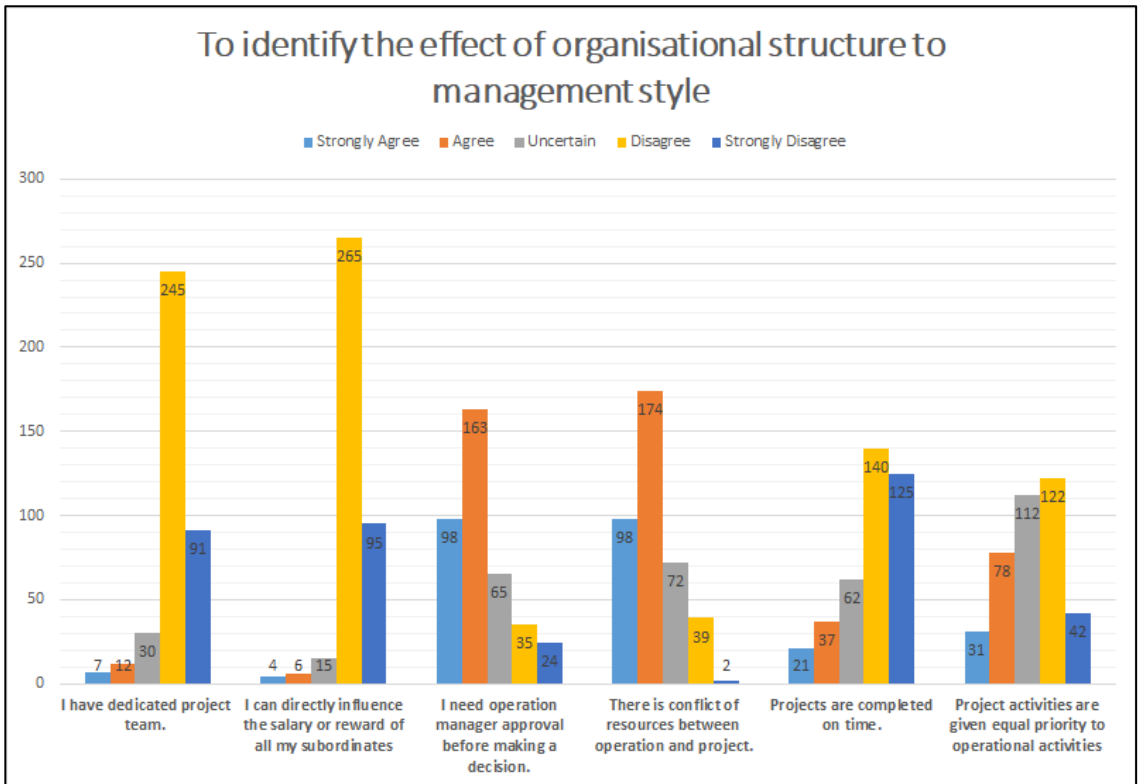
Source: Own construction

The graph above shows that most of the respondents on all six questions seemed uncertain or disagreed, or strongly disagreed. This points to one factor: everything is being done at the top management level, from "I am involved in project strategic goal development" to "project deliverables are measurable at the end of the project". However, people at the team level are not involved or educated about these key project factors. As a result, they are unaware of the goals or objectives of their deliverables and cannot put in 100% effort to achieve those goals.

Category 3: ***To identify the effect of organisational structure on management style.***

Project management takes place in an environment that is broader than the project itself. Understanding this broader environment helps ensure work is aligned with the organisation's goals and managed following established practices.

Of the 385 respondents participating in this survey, 1.8% strongly agree that they have a dedicated project team, while 3.1% agree, 7.8% are uncertain, 63.6% disagree, and 23.6% strongly disagree. When asked if they could directly influence the salary or reward of all their subordinates, 1.0% strongly agreed, 1.6% agreed, 3.9% were uncertain, 68.8% disagreed, and 24.7% strongly disagreed. "I need operation management approval before making a decision": 25.5% strongly agreed, 42.3% agreed, 16.9% were uncertain, 9.1% disagreed, and 6.2% strongly disagreed. When asked if there is a conflict of resources between operation and project, 25.5% strongly agree, 45.2% agree, 18.7% are uncertain, 10.1% disagree, and 0.5% strongly disagree. Are projects completed on time? 5.5% strongly agree, 9.6% agree, 16.1% where uncertain, 36.4% disagree, and 32.5% strongly disagree.8.1% strongly agree, 20.3% agree, 29.1% where uncertain, 31.7% disagree, and 10.9% strongly disagree that project activities are given equal priority to operational activities.



Decision Options	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
I have dedicated project team.	7	12	30	245	91
I can directly influence the salary or reward of all my subordinates	4	6	15	265	95
I need operation manager approval before making a decision.	98	163	65	35	24
There is conflict of resources between operation and project.	98	174	72	39	2
Projects are completed on time.	21	37	62	140	125
Project activities are given equal priority to operational activities	31	78	112	122	42

Figure 5.11: The effect of organisation structure on management style

Source: Own construction

Projects are about teamwork and how teamwork depends greatly on the organisation's structure. In addition, the organisation structure is an environmental factor that can affect resource availability and influence how projects are conducted.

As seen from the survey results, the respondents seem to be in a matrix organisational structure in that;

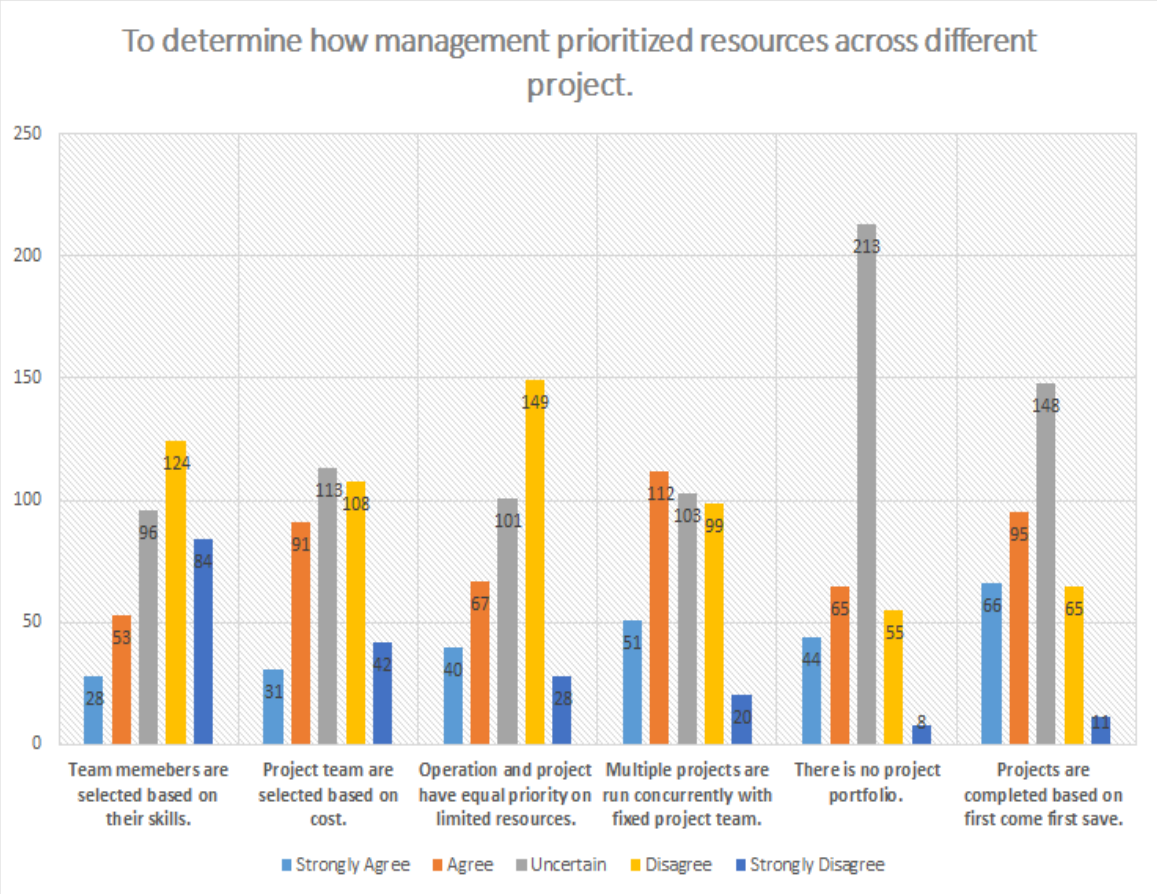
- They disagree with having a dedicated project team
- They disagree with having a direct influence on subordinates' salaries or rewards
- They tend to agree to need operation management approval before making a decision.
- They agree that there is a conflict of resources between the operation and the project.
- They disagree that projects are completed on time.
- They disagree that project activities are given the same priority as operating activities.

Category 4: *To determine how management prioritised resources across different projects.*

Behind every successful project is a great team. The project team comprised people with assigned roles and responsibilities for completing the project. These project teams have varied skill sets and may be assigned full-time or part-time, added or removed from the project as the project progresses. Through careful planning, project managers make sure they assign the best possible teams to the most critical project. All team members' involvement in this planning and decision-making process is beneficial, as they add their expertise to the process and strengthen their commitment to the project.

Of the 385 respondents participating in this survey, 7.3% strongly agreed that team members are selected based on their skills, 13.8% agreed, 24.9% were uncertain, 32.2% disagreed, and 21.8% strongly disagreed. When asked if the project team are selected based on cost, 8.1% strongly agreed, 23.6% agreed, 29.4% were uncertain, 28.1%

disagreed, and 10.9% strongly disagreed. Operation and project have equal priority on limited resources. 10.4% strongly agreed, 17.4% agreed, 26.2% were uncertain, 38.7% disagreed, and 7.3% strongly disagreed. When asked if multiple projects are run concurrently with a fixed project team, 13.2% strongly agreed, 29.1% agreed, 26.8% were uncertain, 25.7% disagreed, and 5.2% strongly disagreed. Finally, when asked if the organisation have a project portfolio, 11.4% strongly agreed, 16.9% agreed, 55.3% were uncertain, 14.3% disagreed, and 2.1% strongly disagreed.17.1% strongly agreed, 24.7% agreed, 38.4% were uncertain, 16.9% disagreed and 2.9% strongly disagree that project is completed based on first come first served.



Decision Options	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
Team memebers are selected based on their skills.	28	53	96	124	84
Project team are selected based on cost.	31	91	113	108	42
Operation and project have equal priority on limited resources.	40	67	101	149	28
Multiple projects are run concurrently with fixed project team.	51	112	103	99	20
There is no project portfolio.	44	65	213	55	8
Projects are completed based on first come first save.	66	95	148	65	11

Figure 5.12: Determine how management prioritised resources across the different projects.

Source: Own construction

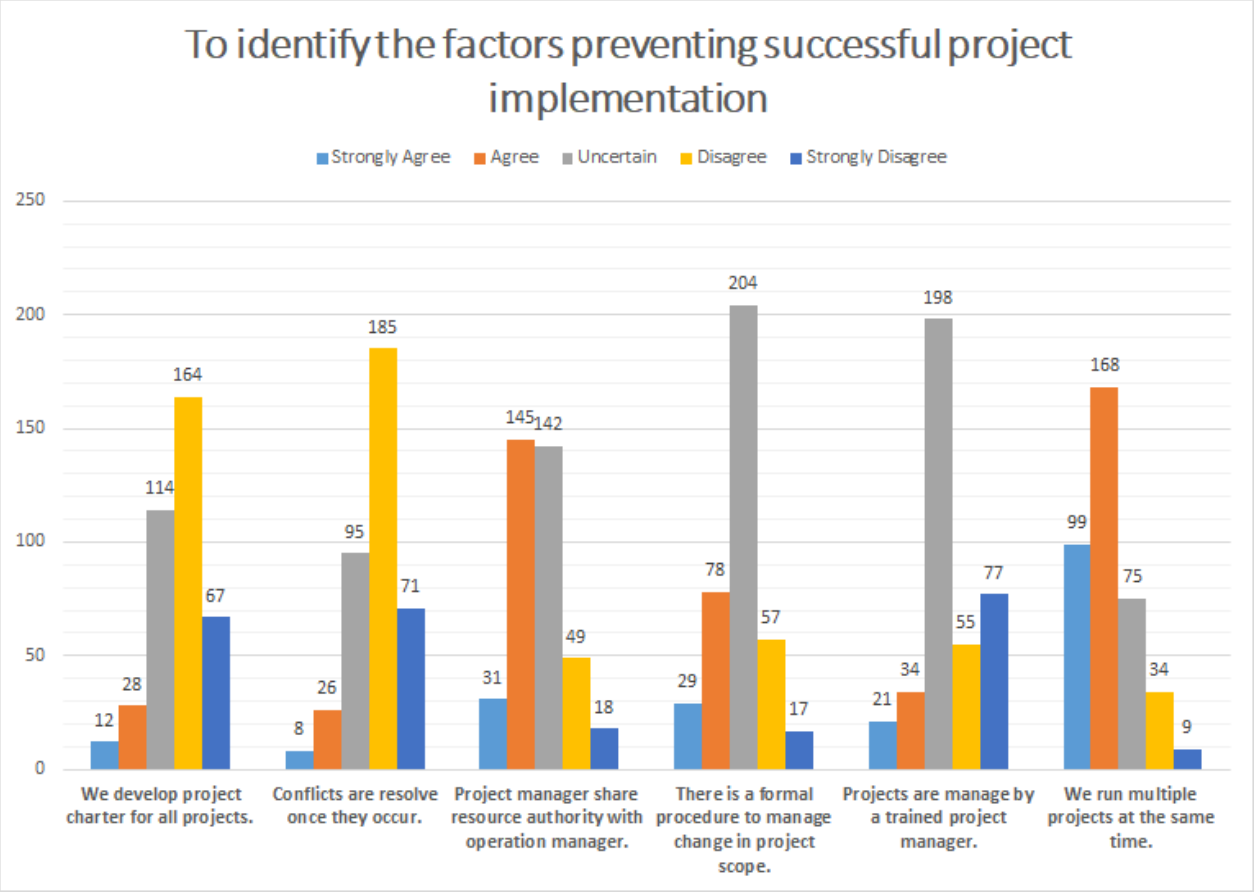
As seen from the survey result, most project team members are not involved in prioritising resources across the different projects. This is a major setback to project success, given that involving all team members in resource planning and decision-making is beneficial, as they add their expertise to the process and strengthen their commitment to the project.

Category 5: *To identify the factors preventing successful project implementation.*

Project managers must keep the team motivated and deal with any conflicts that happen along the way to ensure that all goes well. Project managers need to watch out for the following factors during project execution.

i. Defining phase; Goals, specifications, tasks, and responsibilities.
ii. Planning phase; Schedule, budgets, resources, risks and staffing.
iii. Executing phase; Status report, changes, quality and forecasts.
iv. Closing phase; Train customers, transfer documents, release resources, evaluation, and lessons learned.

Of the 385 respondents participating in this survey, 3.1% strongly agreed that they develop project charter for all projects, 7.3% agreed, 29.6% were uncertain, 42.6% disagreed, and 17.4% strongly disagreed. When asked if conflicts are resolve once they occur, 2.1% strongly agreed, 6.8% agreed, 24.7% were uncertain, 48.1% disagreed, and 18.4% strongly disagreed. Project manager share resource authority with operation manager; 8.1% strongly agreed, 37.7% agreed, 36.9% were uncertain, 12.7% disagreed, and 4.7% strongly disagreed. When asked if there is a formal procedure to manage change in project scope, 7.5% strongly agreed, 20.3% agreed, 53.0% were uncertain, 14.8% disagreed, and 4.4% strongly disagreed. When asked if projects are managed by a trained project manager, 5.5% strongly agreed, 8.8% agreed, 51.4% were uncertain, 14.3% disagreed, and 20.0% strongly disagreed. Finally, 25.7% strongly agreed, 43.6% agreed, 19.5% were uncertain, 8.8% disagreed, and 2.3% strongly disagreed that multiple projects are run at the same time.



Decision Options	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
We develop project charter for all projects.	12	28	114	164	67
Conflicts are resolve once they occur.	8	26	95	185	71
Project manager share resource authority with operation manager.	31	145	142	49	18
There is a formal procedure to manage change in project scope.	29	78	204	57	17
Projects are manage by a trained project manager.	21	34	198	55	77
We run multiple projects at the same time.	99	168	75	34	9

Figure 5.13: Identify factors preventing successful project implementation

Source: Own construction

Most of the respondents who took part in this survey turn to turn to disagree or were uncertain that management implement the following key factors in project execution;

- Develop project charters for projects they manage.
- Resolve conflicts once they occur.
- There is no proper change-management system in place for all projects they run. As a result, anyone, at any time, can decide to make a change in any of the project activities.

While at the same time, they tend to agree or were uncertain about the following points;

- In a mixed matrix organisation, they agree that the project manager tends to share resources with the operation management, which leads to resource constraints on the project they are running.

- Inexperienced project managers run projects due to the lack of experienced project managers.

All the above points can lead to project delays or projects exceeding their estimated budget, resulting in customer dissatisfaction.

CHAPTER 6
CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

In answering the initial research question, as stated in chapter one, the project team selection process is mainly done at the top level without the involvement of other team members. This results in a lack of expertise being added to the process, which could strengthen team members' commitment to the project as they will now feel like they are being involved in decision-making. This will also go a long way to motivate the team and boost their morale to be at their best. However, the research showed that project managers do not support their team members after completing the project. There is no form of training or upskilling to prepare project team members for the next project or the next career path they want to take in life. Most respondents in this research disagree that management cares about their well-being. This can easily result in damaging morale whereby team members will no longer perform at an optimum level, ensuring that projects are completed on time, within budget and meet customer expectations.

6.2 RECOMMENDATIONS

Based on the data collected from the research, the author recommends the following points to mitigate the impact of project management style on project team performance.

1. Get team participation in project team selection.
2. More creative and innovative problem solving
3. Collective agreement for one course of action
4. Better coordination of the tasks between the team members
5. Increased support and teamwork between the team members
6. Stronger commitment to achieving the project objectives
7. Higher levels of team member satisfaction
8. Group members are encouraged to share ideas and opinions, even though the leader retains the final say over decisions.
9. Increased loyalty to the team

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APPENDICES

Appendix A: Questionnaire

Questionnaire

The effect of management style on project team and project success: This research is intended to fulfill the partial requirements for the award of Masters Technologiae in Business Administration in Project Management. The target population is senior managers, project managers and project staff members. This is an academic exercise, do not write your name or that of your firm.

SECTION A

BIOGRAPHY

Please cross the applicable boxes.

1. **What is your position in the organization?**

Project manager	Senior manager	Project staff	Engineer	Other

State position if choose other …….

2. **How long have you been involve with projects at this level?**

0 - 5 years	6 - 10 years	11 - 15 years	16 - More years	Others

3. **What is your gender?**

Male	Female

4. **Who controls decision making in project team meeting?**

Your self	Together as team	Senior management	Everyone involve with project	You persuade peers

5. **Do you have direct authority over team members?**

None	Partially	I have the last say	On some projects	Top management

6. **What industry and you involve in?**

Construction	Engineering	Manufacturing	Service	I.T.

7. **Who calls the meetings?**

Any project staff	Project manager	Top manager	Have set dates	Client

8. **What kind of organizational structure do you have?**

Functional	Projectized	Balance matrix	Weak matrix	Strong matrix

9. What is your highest qualification or equivalent?

Matric	College diploma	National diploma	Degree	Master

10. Are you involve in project selection and alignment of project to organization strategy?

No	Partially	Yes	All project staff	Only top management

PART 2: Close-ended questions (Mark a cross in the appropriate box)

Decision options	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
Code	**1**	**2**	**3**	**4**	**5**

Category 1: *To identify risks associated with management style*	**Decision options**				
17. I develop all project deliverables.	1	2	3	4	5
18. Project stakeholders are identify and register.	1	2	3	4	5
19. Involve client in developing project charter.	1	2	3	4	5
20. Develop project communication plan prior to project start.	1	2	3	4	5
21. Always document lesson learn from past projects.	1	2	3	4	5
22. Always relying on expert opinion to make decisions.	1	2	3	4	5
Category 2: *Projects alignment with organizational strategic plan.*	**Decision options**				
23. I am involve in organisation strategy development.	1	2	3	4	5
24. I understand the link between project and strategy.	1	2	3	4	5
25. I conduct feasibility study before selecting projects.	1	2	3	4	5
26. Management team develop projects based on strategy.	1	2	3	4	5
27. I manage projects selected by departmental management.	1	2	3	4	5
28. Projects deliverables are measurable at the end of projects.	1	2	3	4	5
Category 3: *To identify the effect of organisational structure to management style.*	**Decision options**				
29. I have dedicated project team.	1	2	3	4	5
30. I can directly influence the salary or reward of all my subordinates.	1	2	3	4	5
31. I need operation manager approval before making a decision.	1	2	3	4	5

32. There is conflict of resources between operation and project.	1	2	3	4	5
33. Projects are completed on time.	1	2	3	4	5
34. Project activities are given equal priority to operational activities.	1	2	3	4	5
Category 4: *To determine how management prioritized resources across different project.*	**Decision options**				
35. Projects are selected based on return on investment.	1	2	3	4	5
36. Project are selected based on cost.	1	2	3	4	5
37. Operation and project have equal priority on limited resources.	1	2	3	4	5
38. Multiple projects are run concurrently with fixed project team.	1	2	3	4	5
39. There are no project portfolio.	1	2	3	4	5
40. Projects are completed based on first come first save.	1	2	3	4	5

PART 2 (Continue): Close-ended questions (Mark a cross in the appropriate box)

Decision options	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
Code	**1**	**2**	**3**	**4**	**5**

Category 5: *To assess the impact of fail projects on organization.*	**Decision options**				
41. Organisation strategy are successfully implemented.	1	2	3	4	5
42. Our organisation always has a good yearly turnover.	1	2	3	4	5
43. Our organisation always out perform its competitors. .	1	2	3	4	5
44. Lessons learn are documented and file.	1	2	3	4	5
45. Projects cost overrun are common.	1	2	3	4	5
46. Our market share keep growing.	1	2	3	4	5
Category 6: *To identify the factors preventing successful project implementation.*	**Decision options**				
47. We develop project charter for all projects.	1	2	3	4	5
48. Conflicts are resolve once they occur.	1	2	3	4	5
49. Project manager share resource authority with operation manager.	1	2	3	4	5
50. There is a formal procedure to manage change in project scope.	1	2	3	4	5

51. Projects are manage by a trained project manager.	1	2	3	4	5
52. We run multiple projects at the same time.	1	2	3	4	5

OPEN ENDED QUESTIONS

The effect of management style on project team and project success:

You are expected to provide some information concerning the management style(s) in the spaces below each item as you understand the stated requests.

REQUEST 1; Please provide at most five behavioural patterns by your manager that you are not happy or comfortable with.

1. **……**
2. **……..**
3. **……**
4. **……**
5. **……**

REQUEST 2; Identify specific complaints common among the team members in the project execution you have worked in.

1. **……**
2. **……..**
3. **……**
4. **……**
5. **……**

REQUEST 3; Indicate at most 5 very important manager behavioural patterns that motivate you to work in the team.

1. **……**
2. **……..**
3. **……**
4. **……**
5. **……**

REQUEST 4; least at most five things or behavioural patterns you would use / do to motivate team members if you were the team manager.

1. **……**
2. **…….**
3. **……**
4. **……**
5. **……**

THANK YOU FOR PARTICIPATING

Appendix B: Ethic Certificate

Cape Peninsula University of Technology

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Email: fbmsethics@cput.ac.za

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

The Faculty's Research Ethics Committee (FREC) on **3 May 2022**, ethics **APPROVAL** was granted to **Eric Anonchuhawa (205134726)** for a research activity at the Cape Peninsula University of Technology for **MTech: Business Administration (Project Management)**.

Title of project:	The impact of a project management style on project team performance in an electrical engineering manufacturing industry Supervisor (s): Dr. L. E. Jowah

Decision: APPROVED

 Signed: Chairperson: Research Ethics Committee	18 July 2022 Date

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the CPUT Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study requires that the researcher stops the study and immediately informs the chairperson of the relevant Faculty Ethics Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the confidentiality of the data, should be reported to the Committee in writing accompanied by a progress report.
5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines, and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, notably compliance with the Bill of Rights as provided for in the Constitution of the Republic of South Africa, 1996 (the Constitution) and where applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003 and/or other legislations that is relevant.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data requires additional ethics clearance.
7. No field work activities may continue after two (2) years for Masters and Doctorate research project from the date of issue of the Ethics Certificate. Submission of a completed research ethics progress report (REC 6) will constitute an application for renewal of Ethics Research Committee approval.

Clearance Certificate No | 2022 FBMSREC 032

Appendix C: Language Certificate

PROFESSIONAL EDITING SERVICES
Stand out for the Write reasons

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THE IMPACT OF A PROJECT MANAGEMENT STYLE ON PROJECT TEAM PERFORMANCE IN AN ELECTRICAL ENGINEERING MANUFACTURING INDUSTRY.

By

Eric Anonchuh

with a final word count of 29 038 on 5 December 2022

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

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- *I treated all work as confidential and maintained objectivity in editing*
- *I did not accept work that could be considered unlawful, dishonest or contrary to public interest*

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Gerald T du Preez, PhD

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