Knowledge Base of Project Managers in the South African ICT Sector

A Research Report

presented to the

Graduate School of Business Leadership

University of South Africa

In partial fulfilment of the

requirements for the

MASTERS DEGREE IN BUSINESS LEADERSHIP

UNIVERSITY OF SOUTH AFRICA

by

Keneiloe Moabelo
70987394

01 December 2008

ABSTRACT

This thesis is addressing the knowledge base of project managers in South African Information and Communications Technologies (ICT) sector. It is determining if project management is recognised as an important profession in the ICT Sector; it is also establishing the attributes required for an ICT project manager; the background of ICT project managers with respect to their job experience and qualification and lastly the effectiveness of project management in the ICT sector. A literature review on the knowledge base of ICT project managers is done to clarify particular issues, to determine international perspective on the issues of the study and to contextualise the study. The central research tool was a questionnaire. Project managers from different ICT companies in South Africa were selected to respond to the questionnaire which was mailed to them. Close-ended questions were used in the development of themes and the data were analysed on the basis of tables and graphs and hypothesis testing. The study found that project management is recognised as a career path within the South African ICT sector. It was also found that ICT project managers seem to have a good capability in terms of technical, organic, conceptual and business skills. Most ICT project managers are qualified up to a postgraduate level. They have a degree in another profession and then undertake project management certification. The study also found that project management adds value to the client as well as the company and also adds to the effectiveness of relationships with peers in achieving project goals. The study concluded with recommendations on what can be done to improve the competency of ICT project managers in the ICT sector and also made recommendations for future research.

ACKNOWLEDGEMENTS

To my Lord and Saviour, for being the solid foundation on which my life is built and without whose strength, encouragement, love and wisdom I would never have been able to complete my research work.

I would like to express profound gratitude to my advisor, Prof PD Rwelamila, for his invaluable support, encouragement, supervision and useful suggestions throughout this research work. His moral support and continuous guidance enabled me to complete my work successfully. I appreciate our long meetings and his constructive criticism that have added great value to this research.

I am grateful for the cooperation I received from ICT companies who granted permission for me to send questionnaires to their project managers. Moreover, I would like to acknowledge all of my respondents who took the time to complete the questionnaires when requested to do so.

My sincere gratitude also goes to all my friends, colleagues and fellow students who supported me with their encouragement during my study and to every person who either directly or indirectly contributed to the successful completion of my research.

I wish to share this special moment in my life with my wonderful parents who instilled in me the values I hold dear today, not least of them being the value of hard work. My parents did not tell me to work hard, they lead by example. Mom, dad and Mapita, thank you for your love and support.

I could not have asked for a more loving, supportive and patient husband. Moihlobudi, you are my star. I would not have been able to complete my study without the support that you so unselfishly gave. I thank you. Finally, to my two children, Marwesha and Dimakatso who had to learn to put mum's needs before their own during my study. Thank you for allowing me the space to do my research and for praying for me when I needed it most.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 CHAPTER 1: ORIENTATION

1.1 Introduction

This thesis aims to address the knowledge base of project managers in South African Information and Communications Technologies (ICT) sector.

The majority of corporate challenges involve obtaining better control of existing corporate resources, looking internally rather than externally for solutions. As part of an attempt to achieve internal solutions, executives are looking into the ways corporate activities are managed. Project management is one of the techniques considered to improve production and services.

Project management in South Africa, like in other countries across the world is no longer about managing the sequence of steps required to complete the project on time. It is about systematically incorporating the voice of customers or stakeholders, creating a disciplined way of prioritising effort and resolving trade-offs, working concurrently on all aspects of the project in multifunctional teams, and much more. It involves much closer links between project teams and downstream activities, for example in new product development, integration with manufacturing, logistics and after-sales support (Rwelamila, 2007).

The importance of the project manager in the delivery of successful projects has generated a considerable amount of rhetoric and a smaller body of research-based literature dealing with the knowledge, skills and personal attributes required of an effective project manager. With a few notable exceptions, findings have been based on opinions, primarily of project managers.

According to Turner (2003), there is increased recognition for the potential contribution of project management to the enhanced business performance and the achievement of business goals. It focuses the attention of both individuals and organisations on the assessment and development of project management competence. Competence encompasses knowledge, skills,

attitudes and behaviours that contribute to effective job performance and can be assessed and developed. The most effective assessment and development of project management will include both attribute and performance-based approaches.

The knowledge base of project managers is clearly a vital factor in the success of projects, yet it remains a quality that is difficult to quantify. The majority of research and standards development conducted to date relating to project management knowledge base and competence are based on the opinions of project management practitioners and others in related fields.

Burrows (2003), stated that South Africa was fast becoming the ICT gateway to Africa. The sector saw an emergence post 2002. A total of 77% of the 40 ICT companies that reported results in 2002 reflected an operating profit and it was expected that this percentage would increase to 90% by 2003. This portrayed a broadly healthy and profitable mainstream ICT sector in South Africa. It is within the context of this huge ICT growth in South Africa that ICT project management became an attractive profession to be in, in South Africa. This requires competent ICT project managers who can deliver projects on time, within budget, meeting both utility requirements and high standards of quality.

The research reported here has attempted to establish the knowledge base of South African ICT project managers from a potentially more objective viewpoint, by gathering data using a survey on project management, checking background of project managers, their qualifications and job experience, project management training and development, project management competence and lastly to establish whether project management is recognised as an important profession within the ICT sector.

1.2 Definitions

1.2.1 Information and Communications Technologies

Information and communications technology (ICT) is the study of the technology used to handle information and aid communication. It is an umbrella term that includes any communication device or application, encompassing radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning.

1.2.2 Knowledge Base

The accumulating sum of knowledge on which the advance of a particular industrial sector relies – includes not just codified knowledge but also a tacit knowledge and knowledge embedded in plant and equipment.

1.2.3 Project Management

According to the Project Management Institute (USA), project management is:

"….*the application of knowledge, skills, tools and techniques to project activities in order to meet stakeholders' needs and expectations from a project.*"

The Association of Project Management (UK) defines project management from a different angle as:

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

Both these authoritative project management bodies seem to address the same issues. It is not possible to manage a process unless you have the knowledge, skills and techniques in order to deal with various parts of such process, where tools are used to speed up decision making and information storage.

1.2.4 Project Manager

Project managers are professionals in the field of project management. They have the responsibility of planning, executing, and closing of any project, typically relating to construction industry, architecture, computer networking,

telecommunications or software development. Many other fields in the production, design and service industries also have project managers. A project manager is the person accountable for accomplishing the stated project objectives. Key project management responsibilities include creating clear and attainable project objectives, building the project requirements, and managing the triple constraint for projects, which is cost, time, and scope (PMI, 2004).

1.2.5 Project Management Competencies

According to Turner (2003), there is increased recognition of the potential contribution of project management to the enhanced business performance and the achievement of business goals. It focuses the attention of both individuals and organisations on the assessment and development of project management competence. Competence encompasses knowledge, skills, attitudes and behaviours that contribute to effective job performance and can be assessed and developed. The most effective assessment and development of project management will include both attributes and performance-based approaches.

1.3 Problem Statement

Literature for example, (Mutula and Van Brakel, 2007) suggests that there is an acute global shortage of highly skilled ICT professionals. These professionals are much needed for steering the emerging digital economy in both developed and developing countries including South Africa. In addition, there is a serious lack of certified project managers to help develop the sophisticated applications necessary to power the digital economy and more so the applications that depend on it.

ICT, particularly the internet, is significantly impacting on the operations of business enterprises and is claimed to be essential for the survival and growth of the world's economies. Consequently, business is encouraging the development of the ICT sector as a way to diversify economies and to position itself to play a leading role in the global emerging digital economy. To be able to address these needs, there is a dire need for highly skilled ICT project

managers. This has become crucial since the implementation of strategic management through projects has made more realistic the achievement of highest possible returns through optimal utilisation of available resources (including time, money and people).

This report will address the following primary research questions:

- Is project management recognised as an important profession in the ICT sector?
- Who become project managers in ICT projects?
- What is the background of ICT project managers with respect to their knowledge base?
- What should be done to address issues of ICT project managers' competencies in project management?

1.4 Research Objectives

The objective of this study is to carry out an in-depth analysis of the project management knowledge base within the South African ICT sector, by means of the following:

- establish if project management is recognised as an important profession in the ICT sector
- establish who should become an ICT project manager
- establish the background of ICT project managers with respect to their job experience and qualifications
- make recommendations on what should be done to address issues of ICT project managers' project management competencies

1.5 Delimitation of the Study

In brief, the study does not include the knowledge base of project managers from sectors other than ICT. It only focuses on the ICT sector, even though there may be useful guidelines for such other sectors emerging from this study. It also does not cover the knowledge base outside South Africa.

1.6 Outline of the Research Report

The research proposal will consist of six chapters and an appendix. The basic structure of these is:

Chapter	Description
Chapter 2	**Theory and practice of project management knowledge base** which contains literature review
Chapter 3	**Research methodology** – This chapter will explain the methodologies available to the researcher. It will explain the philosophy behind each methodology, look into each methodology's strengths and weaknesses and justify the selection of the best methodology applicable for this research.
Chapter 4	**Research results** – This chapter presets the research findings with no analyses.
Chapter 5	**Synthesis and analyses of results** – This chapter provides the analysis and synthesis of material obtained through research. (Discusses what the results mean). Hypothesis testing will be performed in this chapter
Chapter 6	**Conclusion and recommendations** – This chapter will draw conclusions based on the results of previous chapters and make recommendations on what can be done to address issues of ICT project managers' competencies with regard to project management. Recommendations for further study will also be listed in this chapter.

Table 1-1: Chapter outline

Chapter 2

THEORY AND PRACTICE OF PROJECT MANAGEMENT KNOWLEDGE BASE

Chapter one is providing the background for the research study.

This chapter explores a wide range of literature on the global approach to project management competency.

It then focuses on project management from a South African perspective. It later zooms in on project management within the ICT sector specifically. The skills and competency of project managers and lastly the attributes of a good ICT project manager are also presented.

2 CHAPTER 2: THEORY AND PRACTICE OF PROJECT MANAGEMENT KNOWLEDGE BASE

2.1 Introduction

The aim of this chapter is to explore aspects of the Information and Communication Technology (ICT) project management knowledge base. An intensive and comprehensive review of the relevant literature which is supported by several theoretical and empirical studies undertaken by other researchers has been engaged. The discipline of project management (PM) and the approaches associated with it are explored to offer some background for this study. This chapter then indicates and describes the competency of ICT project managers and the attributes required to make a good project manager.

2.2 Defining Project Management

Generally, according to the Project Management Institute (PMI) (2004: 5), projects can be defined in terms of their distinctive characteristics and can be summarised as:

"*.....a temporary endeavour undertaken to create a unique product or service*"

A project is temporary in nature, in that it has a definite beginning and an end. The end of the project will occur either when the project's objectives have been achieved, or when it is clear that the objectives cannot be met, or the need for the project no longer exists and it is thus terminated.

According to the Association for Project Management (APM, 2006:2), project management is defined as:

"*The process, by which projects are defined, planned, monitored, controlled and delivered so that agreed benefits are realised*."

Projects bring about change and project management is recognised as the most efficient way of managing such change.

According to PMI (2004: 8), project management constitutes:

"…..the application of knowledge, skills, tools, and techniques to project activities to meet project requirements"

It can be considered as a form of management that provides a single point of integrative responsibility toward achieving project objectives effectively/safely under the triple constraint (APM, 2006). The triple constraint is associated with the different ways in which a project is limited by its goals with regard to *scope* (the work that will be done), *time* (how long it will take to complete the project), and *cost* (the budget needed to complete the project). A project manager needs to balance, and in some cases make trade-offs between these competing goals in order for a project to be successful. However, other elements, particularly quality, play a significant role in meeting project requirements (Kerzner, 2006).

According to IAPPM (2006), project management goes beyond the management of the triple constraints of achieving the project goal on time, to agreed quality and within agreed budget. Because optimum performance and real and sustained success with a project is only possible if the project manager has built an effective team, has satisfied its project customers and has earned the commitment of stakeholders.

2.3 A Global Approach to Project Management Competence

Gareis and Huemann (2000) define PM competence as the ability to perform the project management process efficiently.

PM is becoming increasingly important in almost any kind of organisation today (Kloppenborg and Opfer, 2002). Once thought applicable only to large scale projects in construction, research and development or the defence field, PM has branched out to almost all industries and is used as an essential strategic element for managing and effecting change in modern companies (Kloppenborg and Opfer, 2002, Pinto, 2002). The growing importance of PM

is reflected by the fact that PM has been included as a key element in the IS 2000: Model curriculum (Gorgone, Davis, Valacich, Topi, Feinstein & Longenecker, 2002). Furthermore, 86,925 people worldwide had received the PMI certification in the 12-month period ending December 31, 2005, bringing the total to 181,281. Certcities.com, an internet site for IT professionals, ranked a certification in Project Management as the fourth most valuable certification to have in 2006, up from rank 10 in 2005 (Nagel, 2006).

According to Crawford (1997), PM is an emerging profession operating in an increasing range of industries. As projects become more complex, and as more organisations move to management by projects, there is an increasing demand for competent project managers. Employers need guidance to help them select, develop and support competent project personnel. Project managers and team members need goals for achievement of competence as well as recognition for excellence which will assist them in their careers. These needs underpin the growing international interest in project management competence. This interest includes development of project management standards, the recognition of project management competence through certification of project managers and the accreditation of project management education and training.

Globally, there are many developments occurring in the area of project management standards. Two de facto international standards are now available – the Project Management Institute (USA)'s Guide to the Project Management Body of Knowledge (PMI 2004), which maps the territory a project manager should know, and the Australian National Competency Standards for Project Management which provide the first generic (as opposed to industry or organisation specific) description of what a project manager should be able to do (Crawford, 1997).

Many projects contribute to the project management knowledge base, especially through lessons that have been learnt from successful or sustainable projects. Their vital contribution can assist in improving the theory and practice of project management. An example is the 2001 Standish Group

study that reveals factors, called the CHAOS Ten (revised) that significantly contribute to the success of a project (The Standish Group International, 1994)

2.4 The South African Perspective on ICT Sector

The importance of information and communications technologies (ICTs) as powerful tools for socio-economic development is now widely acknowledged not only among large corporations, but small business enterprises as well. However, for ICT to be effectively deployed as engines of economic development, existing ICT skills gaps both in developed and developing countries must be addressed (Mutula and Van Brakel, 2007).

ICT skills are necessary because without such skills, the technologies can neither be maintained nor adapted to local use. The promotion of education and literacy in general and digital literacy in particular, remains a major challenge facing most countries especially those in the developing world. ILO (2001) observes that adoption of ICT in business environments creates two types of skills needs. The first is related to the variety of foundation skills such as the ability to communicate, analyse and solve problems. The other relates to the technical component which extends beyond the ICT sector to the economy as a whole.

South Africa has a chronic level of ICT skills shortage. According to Dwolatzky (2008), this shortage is mostly visible with regard to project management, system architects, designers and business analysts.

As far as the use of ICT in business enterprises is concerned, the importance of requisite ICT skills is widely acknowledged. The Southern African Development Community (SADC, 2002) and e-Europe þ (2003, p. 2) in a review of the e-readiness of Southern Africa countries, pointed out that a paradigm shift was needed in social attitudes and skills levels, vis-à-vis technology within most communities both urban and rural and within both private and public sector organisations. Moreover, the task force emphasised that SADC member states needed to implement innovative projects to

increase awareness and usage of ICTs in everyday life. The report of the task force pointed out that tertiary education needed to be further developed at both local and regional levels in order to foster and grow the ICT skills base within the region. Furthermore, national educational policies needed to emphasise ICT literacy including curricula reform while entire communities needed to be exposed to the benefits of ICT.

The information age is characterised by global competition based on a high level of information infrastructure with no geographic boundaries. One of the key trends of the Information Age is that of globalisation, the ability to access worldwide resources through innovative technological applications. The main challenge for countries outside of the developed world is to become increasingly proactive rather than reactive in the development of their indigenous ICT sectors. Many nations – developed and developing – recognise this reality and are developing and implementing their own broad ICT strategies. Previously entrenched local markets can come under attack from global competitors. South Africa is well positioned to resist this threat and seize the global imperative in selected areas by focusing on its core strengths (SATIS, 2000).

South Africa already has an established ICT sector. It must be recognised that much of the sector's current strength rests with the large indigenous companies and the foreign multinational enterprises (MNEs) that have chosen to establish a presence in South Africa. These companies already have a substantial share of the local ICT market, and are, in most cases, also active globally. Such companies include, but are not limited to, Telkom SA, Dimension Data, Datatec, IBM South Africa, ICL South Africa, Lucent Technologies, Microsoft SA, Nortel Networks, Novell and others. Global ICT sector trends indicate globalisation and rationalisation of the business activities of these very large companies. In addition, the convergence approach to definition of sector permits a wider range of companies to potentially be included in South Africa such as state owned enterprises Eskom, Transtel, SABC, etc. Whereas the strategy is not interventionist with regard to large companies, it is anticipated that these companies will change

to adapt to the evolving domestic and global market opportunities. For example, telephone companies in some jurisdictions have transformed themselves into broad ICT companies encompassing telecommunications infrastructure and services, applications and content, recognising, in particular, the opportunities brought about by the internet (SATIS, 2000).

In terms of the human resource base, South Africa has an established, but relatively small base of highly skilled, predominantly white, ICT professionals, ICT project management is also not an exception with this regard (SATIS, 2000).

2.5 ICT Project Management

According to Pawłowska (2004), information systems are merely a means to other ends. Therefore, ICT projects should be run by top management and not by ICT experts.

> "*Top management attention is by definition a scarce resource, and often it is not possible to engage this layer in what many see as technical, low-key implementation issues.*"

Furthermore, top management frequently rejects responsibility for ICT projects, shifting it to lower level management or technicians because of their feelings of incompetence and essential incompetence in the ICT field (Pawłowska, 2004).

A deficient project-management workforce is a leading culprit in ICT project-management failure. Quite simply, people make a difference. The competency of those who participate in and lead ICT projects is critical to ICT success. ICT projects turn a company's strategic business and technology vision into reality. Knowing how to align projects with that vision is essential. This may seem obvious, but the evolution of the job of project manager is more accidental than planned, particularly within ICT.

A programmer or software developer may be technically proficient, but may lack the strategic thinking, as well as the communication and management

skills, essential to performing well in the project-manager role. The result is late projects, overrun budgets or outright failure – delivery of the wrong project. A 2003 survey by the Meta Group indicated that 77% of the respondents believed lack of project- and programme-management skills is a major ICT issue.

Project management isn't a simple or intuitive activity, and providing tools and training alone will not ensure the right behaviour. A trained and certified project manager is more likely to establish realistic project-performance baselines, identify and prioritise issues, negotiate corrective actions and sensibly navigate corporate political and cultural situations. However, certification – the most popular of which is provided by the Project Management Institute, a non-profit professional association for project management – validates knowledge of how to run a project. Those are the hard skills required; but they do not necessarily ensure competency in the softer side of project management. Both sets of skills are required for success. Particular attributes appear to be common threads woven into the personalities of successful project managers. They need to love their work and embrace the challenges. They should have a clear vision and the ability to communicate this vision. Also helpful are strong team-building skills, interpersonal communication skills and the discipline to complete each phase of a project properly. ICT leaders should inculcate in their project managers the same skills they themselves need: strong financial management, industry knowledge and the ability to think critically about business strategy. Process analysis and design are also important (Bigelow and Baskerville, 2005).

The era of the accidental project manager is over, and the approach to hiring and training needs to change. Well-defined roles and positions from project planners, controllers, and project managers all the way up to a chief project officer are necessary to support growth and sustain project-management practices throughout the ICT organisation. Companies need to identify and validate these roles by making them part of a career path. By doing this, the company demonstrates the real value of the role these people play (Bigelow and Baskerville, 2005).

2.6 Assessing and Developing Project Management Competency

With the growing competitiveness in the global economy, and increasing pressure on time-to-market, corporations are implementing complex integrated solutions to enable their business strategies. Consistent project management practice is essential, and an individual project manager's competence plays an important part in this.

Project management competence in the project-oriented company is the potential to professionally perform the PM-process (Huemann 2001) based on:

(i) the PM knowledge and PM experience of the organisation
(ii) the PM knowledge and PM experience of teams
(iii) and the PM knowledge and PM experience of the employees.

Organisations have the capability to gather knowledge and experience and to store it in a "collective mind" (Senge 1994). (Willke 1998) describes organisational knowledge as hidden in the systems of organisational principles which are anonymous and autonomous and define the way organisations work. One could find the organisation's knowledge and experience in operation procedures, description of work processes, role descriptions, recipes, routines, etc. In the project-oriented company the organisational competence is captured for example in PM guidelines and procedures, PM standard plans and checklists. In order to perform a project successfully, a project team requires a specific team competence in addition to the PM competencies of the single project team members. The PM competence of a project team is the ability to commonly create the "Big Project Picture", to solve conflicts in the team and to agree on common project objectives.

Individual PM competence is the potential to fulfil an organisational PM role based on PM knowledge and experience. The required project management competence depends on the PM role the person holds.

In the project-oriented company, the individual competence should be in accordance with the organisational competence. The possibility to be

innovative and creative is closely linked to the capability of the project management personnel to use and apply the PM guidelines and standards provided by the organisation. This potential is based on the project management knowledge and experience of the single person. (Huemann and Stummer, 2001)

Interest in project management competence stems from the very reasonable and widely held assumption that if people who manage and work on projects are competent, they will perform effectively and that this will lead to successful projects and successful organisations (Karpin, 1995), he refers to Relationship between Project Management Competence and Organisational Performance (Figure 2-1).

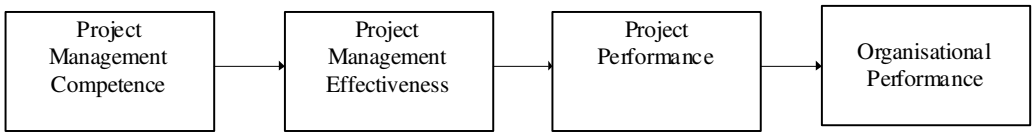

Figure 2-1: Relationship between Project Management Competence and Organisational Performance

Source: Karpin (1995)

The Project Management Institute's first standard to address the theme of 'Improving the Performance of Project Personnel' was the Project Manager Competency Development (PMCD) Framework. This has been developed "to provide both individuals and organisations with guidance on how to manage the professional development of the project manager"

According to PMI (2004), the standard provides guidance on defining project manager competence in the three dimensions below, which then forms a basis for project performance. Refer to Figure 2-2: Components of Project Success:

(i) Knowledge
(ii) Performance
(iii) Personal

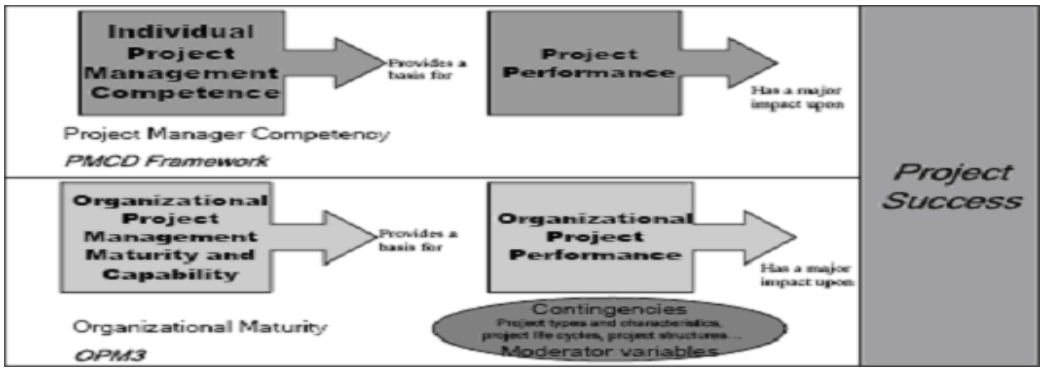

Figure 2-2: Components of Project Success

Source: PMI (2002)

The PMCD framework was developed to enable it to be applied generically to all project managers, regardless of the nature, type, size, or complexity of projects that they may be engaged in managing.

The PMI organises the processes needed to fulfil the aims of project management into the following five groups (PMI, 2004: 41):

(i) **Initiating** – authorising the project or phase

(ii) **Planning** – defining and refining objectives into a project plan and then selecting the best way forward to attain those objectives

(iii) **Executing** – coordinating people and other resources to implement the project plan

(iv) **Controlling** – ensuring that project objectives are met by monitoring and measuring any variances from the plan, in order to take corrective action

(v) **Closing** – formally gaining acceptance of the project or phase

Lifelong learning is becoming increasingly important for project management practitioners operating at the leading edge of technology, who must be able to engage actively in critical thinking and reflection to transform existing knowledge, through creative responses and enhanced decision making, to meet unfamiliar situations. Professional standards and qualifications can provide baseline knowledge and practice but it is the responsibility of each individual to reflect on their practice and actively seek opportunities to develop competence raise benchmarks and improve performance. Current

competence need to be assessed and measured. Refer to Table 2-1 Knowledge-based project management standards, assessments process and qualifications, for examples of available assessment (Liente and Rea, 1995).

Standards or guide	Level	Description	Forms of assessment
Project management Body of knowledge (PMBOK) guide (PMI)	PMP	Project management profession	(i) Multiple-choice exam (ii) Record of experience (iii) Record of education
	CAQ	Certificate of Added Qualification	(i) Must hold current PMP certification (ii) Record of industry-specific experience (iii) Examination demonstrating industry-specific knowledge and skills
ICB: IPMA Competence Baseline (International Project Management Association and member of National Association, for example AFITEP, APM	Level A	Programme or Projects Director	(i) Self-assessment (ii) Project proposal (iii) Project report (iv) Interview
	Level B	Project manager	(i) Self-assessment (ii) Project proposal (iii) Project report (iv) Interview
	Level C	Project management professional	(i) Evidence of experience (ii) Self-assessment (iii) Formal examination (iv) interview
	Level D	Project management	(i) Formal examination (ii) Direct questions (iii) Open essays
P2M	PMA	Programme Management Architect	(i) Interview (ii) Assay test (iii) Experience of at least three projects
	PMR	Project manager	(i) Interview (ii) Assay tests (iii) Experience of at least one project
	PMS	Project management specialist	(i) Written examination

Table 2-1: Knowledge-Based Project Management Standards, Assessments Process and Qualifications
Source: Liente and Rea (1995).

According to the International Association for Project and Program Management (IAPPM, 2006), certification is not designed to be yet another standard for project management, it is intended to be a lifelong standard for project management.

All the certificates mentioned in Table 2-1 have something in common, they demonstrate that one has passed the exam and therefore have some theoretical knowledge about project management. However, there are certain things missing which certificate holders cannot claim to have. These are:

- Passion for project delivery
- Application of the skills
- Interpersonal skills
- Culture sensitivity
- Ability to deal with corporate policies

Project managers need to understand that continuous learning plays a key role in the life of a project practitioner (IAPPM, 2006).

2.7 Organisational Learning Practices in the PM Environment

Project organisations, as with all organisations, are faced with continuously improving the quality of their products and services to compete in the competitive environment in which they do business. The competitive environment includes the shift to a knowledge-based society (Toffler, 1990) and the need to improve knowledge faster than the competition (Stata, 1989). The key to quality is producing the products and services the customer desires. Quality for a project organisation is defined as meeting the customer's requirements within the project's cost, schedule and technical performance requirements. Consistently delivering quality projects is related to the project manager's ability to manage a project. This ability is built over time from experience on many projects. Learning is the process by which knowledge is created from experience and the path by which improvement

takes place (Bohn, 1994). Peters and Homer (1996) emphasise the need for project managers to learn continuously.

For the project organisation to learn, organisational members must create, share, and apply knowledge (Argyris and Schon, 1978). The organisation's members create new knowledge by being engaged in a learning experience.

2.8 The Value of Project Management

According to the research by Parker (2002), implementing project management adds significant value to organisations. This conclusion is the result of a survey of more than 100 senior-level project management practitioners by the Centre for Business Practices, the research arm of the consulting and training organisation, Project Management Solutions, Inc. More than 94% of the respondents stated that implementing project management added value to their organisations. Organisations cited significant improvements in financial measures, customer measures, project/process measures, and learning and growth measures. All organisations in all industries, irrespective of their size reported improvement.
What should organisations expect when implementing project management initiatives? Average improvements to the order of 50% in project/process execution, 54% in financial performance, 36% in customer satisfaction, and 30% in employee satisfaction were noted by the companies surveyed. Those organisations that do not implement project management will be at a competitive disadvantage to those who do (Parker, 2002).

2.9 Attributes of a Good Project Manager

In trying to answer the question of who should become an ICT project manager, we look into the attributes of a good project manager and try to link them with those of an ICT project manager.

The first component of the model is project management skills. Numerous studies have consistently shown that for project managers and staff, technical knowledge and skills on the one hand, and people skills on the other hand,

are essential to project success (Barad and Raz, 2000; Jawaharnesan and Price, 1997; Jiang, Klein and Balloun, 1996; Loo, 2002).

According to Liente and Rea (1995), a good project manager should develop respect among team members and management as a source of power.

The following skills are essential attributes for a good project manager:
Communication – A project manager needs to communicate well verbally and in writing and outside of the project. Communication problems have been identified as a major source of project failure.

Generalist – The project manager must have the ability to see the big picture and then relate it to the current situation. The manager must convey the meaning to management and to the team

Problem Solver – A project manager must be able to identify and understand problems, place them in perspective and then develop and implement solutions.

Experience - Project managers must be able to integrate and apply the experience gained on previous projects to the current project.

Knowledge – A project manager needs to acquire information about all aspects of the project quickly.

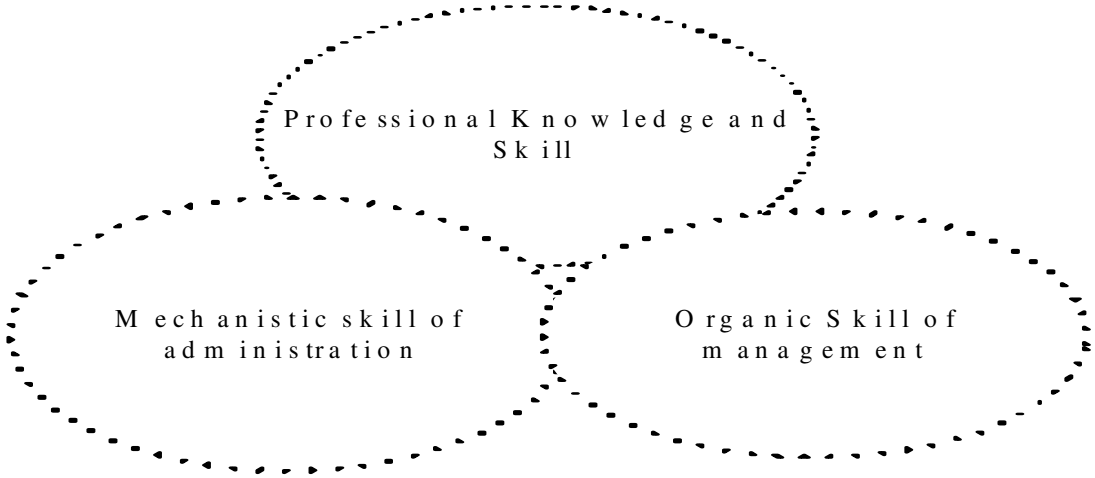

Figure 2-3: Project Management Skills and Knowledge

Source: Keeling (2000)

Keeling, 2000 states that a good project manager should have appropriate knowledge in the three overlapping areas as seen in Figure 2.3. These are labelled Organic, Professional and Administrative – three broad areas of behaviour, experience and ability that make up a pattern of competency and acceptability in project situations.

2.9.1 Organic Skills

All people have some kind of organic skills but in some people the organic skills are better developed and more effective than in others. They include

(i) Interpersonal skills

- Leadership ability – the ability to inspire, motivate and influence others
- Communication skills

(ii) Personal skills and attributes

- Perseverance
- Determination
- Courage and fortitude
- Self-respect and assurance
- Behaviour patterns

(iii) Conceptual skills

- Spatial skills – ability to visualise physical relationships and positioning
- Imagination, vision and foresight

Ability in each of the organic skills is needed for all ICT project managers, but most importantly, conceptual skill and in particular during the concept development and planning phase. The first and second skills – interpersonal and personal skills are important during the project implementation phase (Keeling, 2000).

2.9.2 Professional and Specialist Skill and Knowledge

A specialist's knowledge is often assessed by way of academic record, which if valid, provides evidence of study and ability to pass examinations or complete academic projects (Keeling, 2000).

2.9.3 Mechanistic Skill and Knowledge

These are skills of administration, the mechanics of planning, scheduling, purchasing, financial and operational control (Keeling, 2000).

2.10 Summary

This chapter explored the literature of project management knowledge in the ICT sector. It defined what project management is. There was also a discussion about a global approach to protect management competencies. The chapter also covers the South African perspective on project management and also zooms in on project management within the ICT sector specifically. Assessing and developing project management competency was also discussed and finally also the attributes of a good project manager.

Chapter 3

RESEARCH METHODOLOGY

Chapter two explored the literature of project management knowledge in the ICT sector.

This chapter

describes the research methodology adopted to investigate this concept further from a South African perspective.

The qualitative research methodology, quantitative research methodology, preferred research methodology and questionnaire design for the research are described.

3 CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The previous chapter discussed various literature aspects that are relevant to the title of the dissertation. In this chapter the researcher explains the methods and procedures used in this study. These are sampling design, research design, data collection, data analysis, study limitations and ethical considerations. The research methodology outlines the way in which the study is conducted and the manner in which ethical standards are maintained. The methodology is summarised in the following steps:

- Analysing and synthesising the literature review
- Developing questionnaire
- Conducting a questionnaire pilot
- Distributing questionnaire to various project managers
- Analysing findings
- Reviewing
- Presenting data in tables and graphs
- Compiling a report

3.2 Research Design

3.2.1 Research Type

(i) Qualitative Method

Qualitative research uses qualifying words and descriptions to record aspects about the world through qualitative data, such as interviews, documents and participant observation, to understand and explain social phenomena (Myers, 1997: 241). The methodology is sensitive to understanding and analysing the perspectives of human experience through a process of description that is expressive and persuasive in language (Bless and Higson-Smith, 2000: 38; Creswell, 1998: 14; Gillham, 2000: 11). This research study adopts the following definition of qualitative research (Creswell, 1998: 15):

> *"Qualitative research is an inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem. The researcher builds a complex, holistic picture,*

analyses words, reports detailed views of informants, and conducts the study in a natural setting."

Leedy and Ormrod (2005) have the following to say about qualitative research:

"*To answer some research, we cannot skim across the surface. We must dig to get a complete understanding of the phenomena we are studying. In qualitative research, we do indeed dig deep: we collect numerous forma of data and examine them from various angles to construct a rich and meaningful picture of a complex situation"*

The strengths of the qualitative method include:

- Obtaining a more realistic feel of the world that cannot be experienced in the numerical data and statistical analysis used in quantitative research
- Flexible ways to perform data collection, subsequent analysis and interpretation of collected information
- Providing a holistic view of the phenomena under investigation (Bogdan and Taylor, 1975)
- Ability to interact with the research subjects in their own language and on their own terms (Kirk and Miller, 1986)
- Descriptive capability based on primary and unstructured data

The weaknesses of the qualitative method include:

- Departing from the original objectives of the research in response to the changing nature of the context (Cassell and Symon, 1994)
- Arriving at different conclusions based on the same information depending on the personal characteristics of the researcher
- Inability to investigate causality between different research phenomena
- Difficulty in explaining the difference in the quality and quantity of information obtained from different respondents and arriving at different, non-consistent conclusions
- Requiring a high level of experience from the researcher to obtain the targeted information from the respondent

- Lacking consistency and reliability because the researcher can employ different probing techniques and the respondent can choose to tell particular stories and ignore others

(ii) Quantitative Method

The functional or positivist paradigm that guides the quantitative mode of inquiry is based on the assumption that social reality has an objective ontological structure and that individuals are responding agents to this objective environment (Morgan and Smircich, 1980). Quantitative research involves counting and measuring of events and performing the statistical analysis of a body of numerical data (Smith, 1988). The assumption behind the positivist paradigm is that there is an objective truth existing in the world that can be measured and explained scientifically. The main concerns of the quantitative paradigm are that measurement is reliable and valid in its prediction of cause and effect (Cassell and Symon, 1994).

Being deductive and particularistic, quantitative research is based upon formulating the research hypotheses and verifying them empirically on a specific set of data (Frankfort-Nachmias and Nachmias, 1992). Scientific hypotheses are value-free. The researcher's own values, biases, and subjective preferences have no place in the quantitative approach. Researchers can view the communication process as concrete and tangible and can analyse it without contacting actual people involved in communication (Ting-Toomey, 1984).

The strengths of the quantitative method include:

- Stating the research problem in very specific and set terms (Frankfort-Nachmias and Nachmias, 1992)
- Clearly and precisely specifying both the independent and the dependent variables under investigation
- Following firmly the original set of research goals, arriving at more objective conclusions, testing hypotheses, determining the issues of causality

- Achieving high levels of reliability of gathered data due to controlled observations, laboratory experiments, mass surveys, or other forms of research manipulations (Balsley, 1970)
- Eliminating or minimising subjectivity of judgment (Kealey and Protheroe, 1996)
- Allowing for longitudinal measures of subsequent performance of research subjects

The weaknesses of the quantitative method include:

- Failure to provide the researcher with information on the context of the situation where the studied phenomenon occurs
- Inability to control the environment where the respondents provide the answers to the questions in the survey
- Limited outcomes to only those outlined in the original research proposal due to closed type questions and the structured format
- Not encouraging the evolving and continuous investigation of a research phenomenon

(iii) The Research Methods used in this Thesis

Based on the strengths and weaknesses of both research types discussed above, a quantitative research methodology using a research questionnaire has been adopted to answer the research questions discussed in chapter 1.

The reason why the quantitative method was preferred to the qualitative method, is that it allowed the researcher to

- state the research problem in very specific, definable, and set terms;
- follow the original set of research goals;
- achieve high levels of reliability of gathered data due to surveying;
- test the research hypotheses that the researcher formulated in chapter 1 and
- arrive at more objective conclusions by minimising subjectivity of judgment.

3.2.2 Instrumentation

Data collection is an important aspect of any type of research study. Inaccurate data collection can impact the results of a study and ultimately lead

to invalid results. Since this research study is based on the quantitative research method, the focus will only be on the quantitative data collection methods.

Typical quantitative data gathering strategies include:

- Experiments/clinical trials.
- Observing and recording well-defined events (for example counting the number of patients waiting in an emergency room at specified times of the day).
- Obtaining relevant data from management information systems.
- Administering surveys with closed-ended questions (for example face-to-face and telephone interviews, questionnaires, etc).

Interviews

According to Leedy and Ormrod (2005), quantitative research (survey research) interviews are more structured than those in qualitative research. In a structured interview, the researcher asks a standard set of questions and nothing more.

Face-to-face interviews have the distinct advantage of enabling the researcher to establish rapport with potential participants and therefore gain their cooperation. These interviews yield highest response rates in survey research. They also allow the researcher to clarify ambiguous answers and when appropriate, seek follow-up information. Disadvantages include impracticality when large samples are involved and it can be time consuming and expensive (Leedy and Ormrod, 2005).

Leedy and Ormrod (2005), also state that **telephone interviews** are less time consuming and less expensive and the researcher has ready access to anyone on the planet that has a telephone. A disadvantage is that the response rate is not as high as the face-to-face interview, but it is considerably higher than the mailed questionnaire. The sample may be biased to the extent that people without phones are part of the population about whom the researcher wants to draw inferences.

Computer Assisted Personal Interviewing (CAPI) is a form of personal interviewing, but instead of completing a questionnaire, the interviewer brings along a laptop or hand-held computer to enter the information directly onto the database. This method saves time involved in processing data, as well as saving the interviewer from carrying around hundreds of questionnaires. However, this type of data collection method can be expensive to set up and requires that interviewers have computer and typing skills (Leedy and Ormrod, 2005).

Questionnaires

Paper-pencil-questionnaires can be sent to a large number of people and saves the researcher time and money. Because their responses are anonymous, people are more truthful when responding to the questionnaires, in particular with regard to controversial issues. It however also have its drawbacks. The majority of people who receive questionnaires don't return them and those who do, might not be representative of the originally selected sample (Leedy and Ormrod, 2005).

Web-based questionnaires: A new and inevitably growing methodology is the use of internet-based research. This would mean receiving an email on which you would click on an address that would take you to a secure website to fill in a questionnaire. This type of research is often quicker and less detailed. Some disadvantages of this method include the exclusion of people who do not have a computer or who are unable to access a computer. Also the validity of such surveys is in question as people might be in a hurry to complete it and so might not give accurate responses (Canada's National Statistics Agency, 2006).

The preferred research instrument utilised in this research study, was an electronic questionnaire, administered through the email facility. Prior to sending out the questionnaire for data collection, it was anticipated that some measure of sensitivity would occur. Hence, the questionnaire was piloted with the objective being to detect misunderstandings, incorrect questioning and

any sensitivity. In the act of piloting the questionnaire, copies of the questionnaire were sent to three colleagues within ABSA Information Management (GIS) Department who did not belong to the chosen sample. For the type of study and the objectives, there was a general agreement that the approach and instrumentation were acceptable.

In order to improve contact rates, and as a result, response rates, the original email was to be followed by two reminders (refer to Appendix III), sent at two-week intervals. The researcher was targeting a response rate of 60%.

3.3 Sampling Process

Table 3-1 outlines the sampling process followed in this thesis.

Stage	Description
Population definition	The target population would be project managers from the South African ICT sector
Sampling frame	Questionnaires would be sent to South African PM from ICT sector
Sampling method	Internet search for South African ICT companies will be done.
Sample size	Due to the heterogeneity of the sample population, sufficient surveys would be sent out.
Drawing the sample and collecting data	• Participants to the survey would be selected from the internet search results. A random sample would be selected. Requests will then be made by email regarding participation in the research by the selected company (refer to Appendix I). • After receiving the PM contacts a request to participate in the research will be sent. Refer to Appendix II. • Two reminders on two-week intervals will be sent to participants who have not responded yet. Refer to Appendix III • On receipt of the questionnaire response, a thank you note is sent to the respondent together with a request to the respondent to refer the researcher to another project manager from the same organisation so as to have two respondents per company

Table 3-1: Sampling Process

3.4 Measurement Scales

Since the sample population is heterogeneous, a combination of variables would be used in the surveys. In order to identify participants, nominal and ordinal variables would be used. Survey questions would vary from ordinal to ratio variables, depending on how the questions are posed.

Nominal measurement

It consists of assigning items to groups or categories. No quantitative information is conveyed and no ordering of the items is implied. Nominal scales are therefore qualitative rather than quantitative. Religious preference, race and sex are all examples of nominal scales. Frequency distributions are usually used to analyse data measured on a nominal scale. The main statistic computed is the mode. Variables measured on a nominal scale are often referred to as categorical or qualitative variables.

Ordinal Measurement

Measurements with ordinal scales are ordered in the sense that higher numbers represent higher values. However, the intervals between the numbers are not necessarily equal. For example, on a five-point rating scale measuring attitudes toward gun control, the difference between a rating of 2 and a rating of 3 may not represent the same difference as the difference between a rating of 4 and a rating of 5. There is no "true" zero point for ordinal scales since the zero point is chosen arbitrarily. The lowest point on the rating scale in the example was arbitrarily chosen to be 1. It could just as well have been 0 or -5.

3.5 Data Collection

Questionnaires would be used as a primary test of the knowledge base of project managers in the South African ICT sector. The questionnaires would be administered to project managers from the ICT sector. The results of the survey would be used to either reject or accept the identified hypothesis.

Refer to Table 3.2 for the questionnaire outline:

A letter to the company requesting permission to conduct research at their company Refer to Appendix I	
Questionnaire – Refer to Appendix IV for a full questionnaire	
Section 1 Questions 1.1 to 1.3	**Biographical details** To establish the background of project managers *(age, gender and designation)*
Section 2 Questions 2.1 to 2.7	**Qualifications and job experience** To establish the background of project managers (general qualifications, PM qualifications, general experience and PM experience)
Section 3 Questions 3.1 to 3.5	**Project management training and development** To establish the background of project managers
Section 4 Questions 4.1 to 4.15	**Project management competence** To establish who should become an ICT project manager
Section 5 Questions 5.1 to 5.4	**Recognition of benefits of project management** To establish if project management is recognised as an important profession within the ICT sector

Table 3-2: Questionnaire Outline

3.6 Ethical Considerations

There were a number of ethical considerations to keep in mind during the research. First and foremost it was to protect the anonymity of the respondents as well as their managers. It is considered unethical to use any personal details on respondents in the report that could be used to identify either the respondent or his/her manager. All communication with respondents was treated in the strictest confidence and participation (or non-participation) and/or participant responses will not be revealed to any external parties.

Participation in the survey was entirely voluntary and all emails related to the survey contained a clear narrative describing the purpose of the study, as well as a guarantee that the information provided would not be used for any purpose other than stated.

3.7 Perceived Limitations of the Research

There are several limitations to the proposed study, the most significant of which is related to the size of the sample used in the investigation. Difficulty in getting project managers details from an HR contact due to company policy not to give out personal details of any employees.

Another limitation is that since respondents did not directly benefit from the study, they were not interested in responding, thus only few responses were received.

A further limitation in this research related to the fact that the study only focused on the responses from project managers and nothing from top management or subordinates.

The other limitation is that there is limited literature on the subject of the knowledgebase of project managers in the ICT sector.

3.8 Summary

This chapter discussed research design and methodology. The study scope, instrumentation, research type, population and sample, sampling methods, data-gathering methods, duration of study, data analysis and the computer programmes used, were discussed from a theoretical perspective. A discussion of how these were applied in this study was also presented. Justifications for the choices made were also given. The next chapter presents the study findings.

Chapter 4
RESEARCH RESULTS

Chapter three described the research methodology adopted to investigate this concept further from a South African perspective.

This chapter

presents the research results

4 CHAPTER 4: RESEARCH RESULTS

4.1 Introduction

The research methodology was discussed in chapter 3. This chapter presents the research results. These results are presented based on the questionnaires (Appendix V) to pave a way for an analysis of the findings and ultimately recommendations. Respondents consisted of 33 project managers from the ICT sector based in South Africa.

Data were gathered through a questionnaire that contained only close-ended questions. The questions were broadly categorised as biographic details, qualifications and job experience, project management training and development, project management competence and recognition of benefits of project management. The chapter presents in this order. Tables and graphs are used to present the data.

4.2 Sample

The sample was taken from a population of about 100 South African ICT companies searched from the internet using the following websites and search engines:

- Ananzi
- Google
- moneyweb.com
- ITWeb
- g3ict.com

Aricent	Ernst and Young	Mustek
Azisa	Faritec	NEC
Blue Platinum	Flextronics SA	Sita
Brait	GijimaAst	Paracon
Business Connexion	Greentec	PC-WARE
Bytes Technology	Hatch	Prism
Cell C	Hewlett-Packard	SAB Miller IT
Cisco	IBM	Satreno
CompTIA	IDS	Self employed
CSC	Information Solutions	Sentech
Data Centrix	Internet Speech	Striata
Denelaviation	Lonmin Information Management	Tech Style
Dex	Macdomlds IT	Telkom
Digital Mall	Madamu Technologies	Transnet
Dimension Data	Microsoft	Virgin Mobile
Edcon	MTN	Vodacom
Empowerdex	Murrob	

Table 4-1: Sample Companies

The simple randomisation method was utilised to select 50 ICT companies from a list of 100 South African ICT companies. Each company was assigned a sequential number from 1 to 100. The numbers were written on a piece of paper and placed in a bag. Fifty numbers were then drawn from the bag. The companies represented by the numbers that were drawn from the bag, were used to participate in the survey. Refer to Table 4-1 for the list of companies that were selected via the simple randomisation method.

Once the companies were selected, further internet searches were done on the companies chosen through simple randomisation to get a contact person from whom details of project managers, who could participate in the survey, could be sourced. Some company websites had details of Human Resource

(HR) personnel and in those cases a letter of request to conduct research at their company was emailed directly to the HR person. Some websites had a generic email address to the webmaster e.g. info@xulugrp.co.za, support@is.co.za or info_rsa@comptia.org, while other websites had a built in webpage whereby a request for a project manager's details was placed directly on the website. (Refer to Appendix I.) The intention was to receive contact details of two project managers from each company.

From the 50 companies selected through randomisation, only 22 companies provided PM contact details. (Refer to Table 4-2.) Due to the nature of this data-gathering method, it was difficult to get feedback as some HR personnel indicated that they were uncomfortable to give out information about their staff and some others indicated that it was against company policy. Some did not respond at all. In a few instances the companies gave feedback with the details of two project managers and in most instances just one project manager.

On receipt of the project manager details, an email was sent to request participation in the survey. (Refer to Appendix II.) On receipt of the survey response, a further request was given through to the respondent to provide the details of another project manager who might be interested in participating in the survey. A total of sixty questionnaires were sent out which includes those referrals.

4.3 Respondents

From the sixty questionnaires sent out, 33 project managers responded. Refer to Table 4-2 below. Note that some companies have three respondents due to referrals.

Company	Number of respondents
Aricent	3
Brait	1
Cell C	1
Contractor – ICT	1
Denelaviation	1
Dimension Data	1
Edcon	1
Faritec	2
GijimaAST	2
Hatch	2
IBM	2
IDS	1
Lonmin Information Management	1
Microsoft	1
MTN	1
SAB Miller IT	2
Satreno	1
Sita	2
Telkom	3
Transnet	1
Virgin Mobile	1
Vodacom	2

Table 4-2: Respondents Companies

4.4 Biographic Data

4.4.1 Age of Respondents

Ages (in years)	Number of respondents
< 20 years	0
21 – 30	7
31 – 40	20
41 – 50	2
51 – 60	4

Table 4-3: Age of Respondents

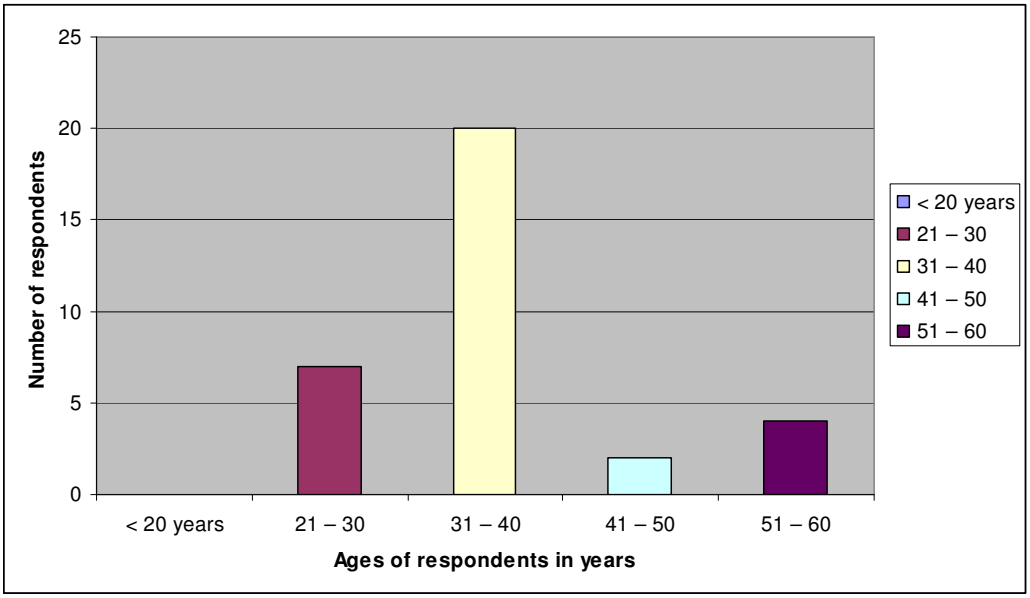

Figure 4-1: Age of Respondents

As indicated in Table 4-3 and Figure 4-1, most respondents (n=20 or 61%) were in the age group ranging from 31 to 40 years, while one (n=7 or 21%) was between 21 and 30 years. No respondents were younger than 20 years. Two (6%) respondents were between 41 and 50 years and four (n=4 or12%) were between 51 and 60 years.

4.4.2 Gender of Respondents

Gender	Number of respondents
Females	17
Males	16

Table 4-4: Gender of Respondents

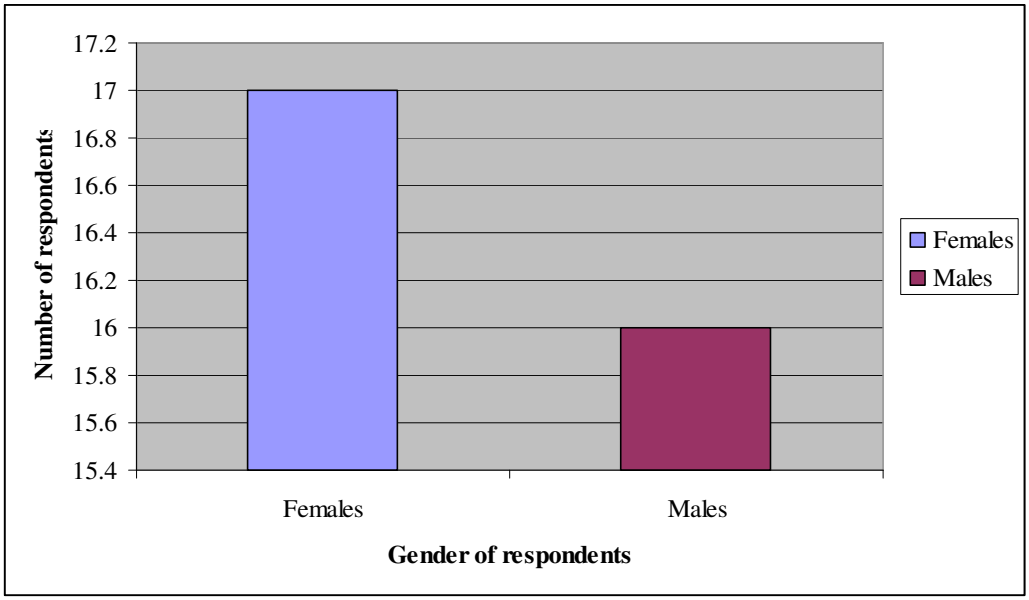

Figure 4-2: Gender of Respondents

As indicated in Table 4-4 and Figure 4-2, 17 (n=17 or 51.5 %) of the respondents were females, while 16 (n=16 or 48.5%) of the respondents were males.

4.4.3 Project Management Designation of respondents

Project management designation	Number of respondents
Junior project manager	3
Project manager	15
Senior project manager	6
Project coordinator	1
Programme manager	5
Other (Former PMs): • Group IT manager • Senior Manager • PMO manager	3

Table 4-5: PM Designations

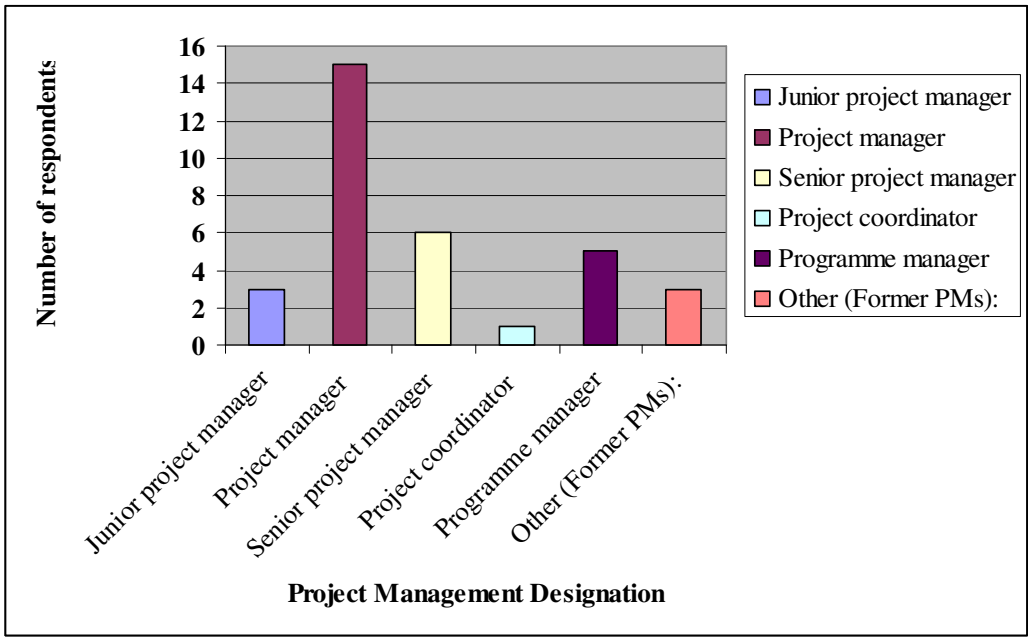

Figure 4-3: Project Management Designations

As indicated in Table 4-5 and Figure 4-3, most respondents, that is 15 (n=15 or 45%) hold the designation of project manager, while six (n=6 or 18%) were senior project managers. Five (n=5 or 15%) were programme managers and three (n=3 or 9%) of the respondents were junior project managers. There was just one (n=1 or 3%) project coordinator. Three (n=3 or 9%) of the other respondents were former ICT project managers now holding the designation of Group IT manager, PMO manager and senior manager in the project environment and still in the ICT sector.

4.5 Qualifications and Job Experience

4.5.1 Highest Educational Qualification of Respondents

Highest educational qualification	Number of respondents
Below Grade 12	0
Grade 12	2
One year post-matric qualification	1
Degree	10
Postgraduate degree	20

Table 4-6: Highest Educational Qualifications

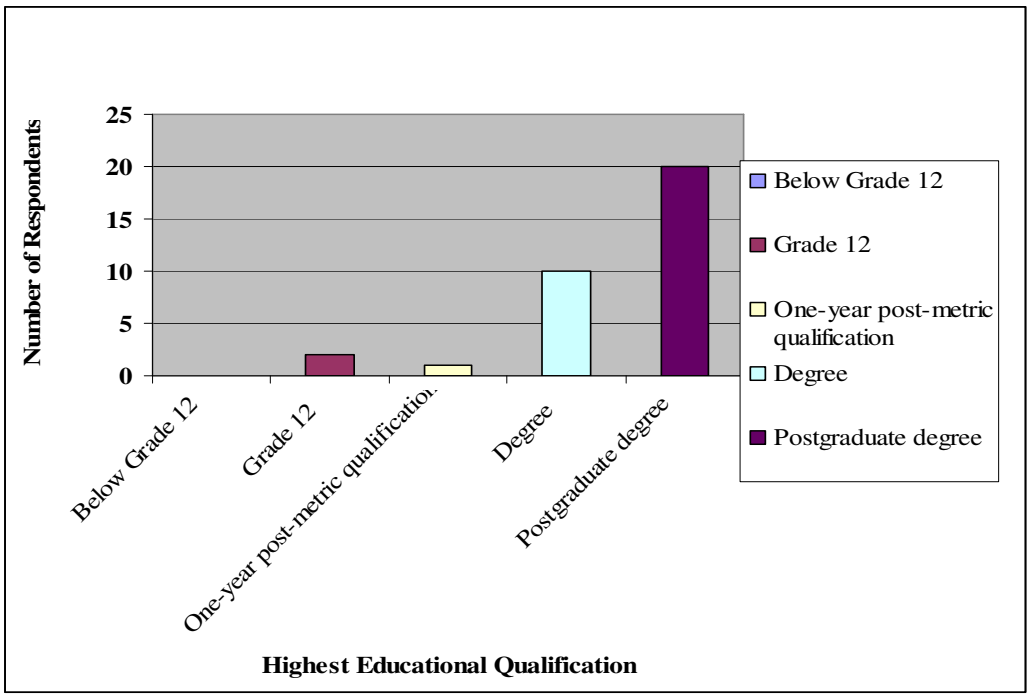

Figure 4-4: Highest Educational Qualification

As indicated in Table 4-6 and Figure 4-4, none of the respondents had as their highest educational qualification a qualification below grade 12. Two (n=2 or 6%) of the respondents had grade 12 as their highest educational qualification, while only one (n=1 or 3%) had a one year post-matriculation qualification. Ten (n=10 or 30%) of the respondents had a degree while most of the respondents, 20 that is, (n=20 or 61%) have a postgraduate degree.

4.5.2 Highest Project Management Qualification of Respondents

Highest project management qualification	Number of respondents
None	5
Project Management diploma	8
Project Management degree	3
Postgraduate degree in project management	3
Other (mostly PM certificate)	14

Table 4-7: Highest Project Management Qualifications

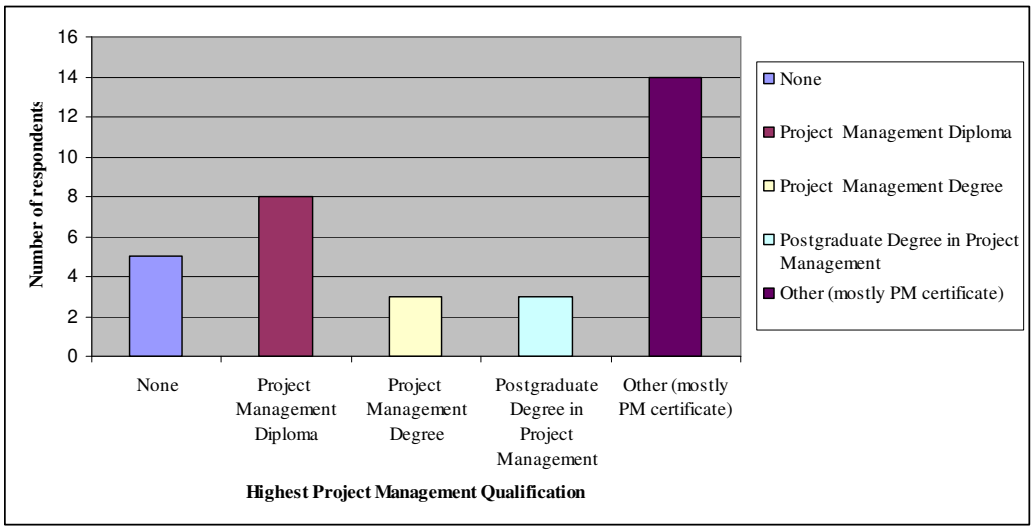

Figure 4-5: Highest Project Management Qualification

As indicated in Table 4-7 and Figure 4-5, five (n=5 or 15%) of the respondents do not have any project management qualifications, while eight (n=8 or 24%) have a project management diploma. Three (n=3 or 9%) of the respondents have a project management degree, the other three (n=3 or 9%) have a project management postgraduate degree. The majority of the respondents, that is 14 (n=14 or 43%) have a project management certificate.

4.5.3 Project Management Certification

Project management certification	Number of respondents
None	10
PMP	18
CAPM	0
APMP	0
Other (including those still studying)	5

Table 4-8: Project Management Certification

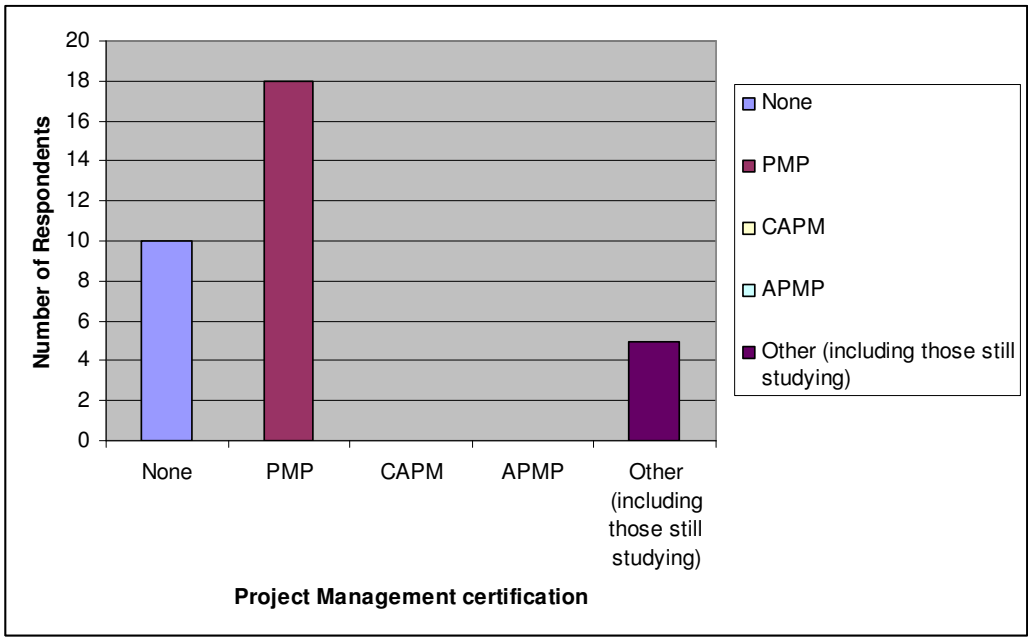

Figure 4-6: Project Management Certification

As indicated in Table 4-8 and Figure 4-6, ten (n=10 or 30%) of the respondents have no project management certification. Most of the respondents, 18 in total (n=18 or 55%) are PMP certified. None of the respondents are CAPM or APMP certified. Five (n=5 or 15%) of the respondents are studying towards PMP, CAPM or APMP certification.

4.5.4 General Job Experience

General job experience (in years)	Number of respondents
< 1 year	0
1 – 2	1
3 – 5	2
6 – 10	7
> 10 years	23

Table 4-9: General Job Experience

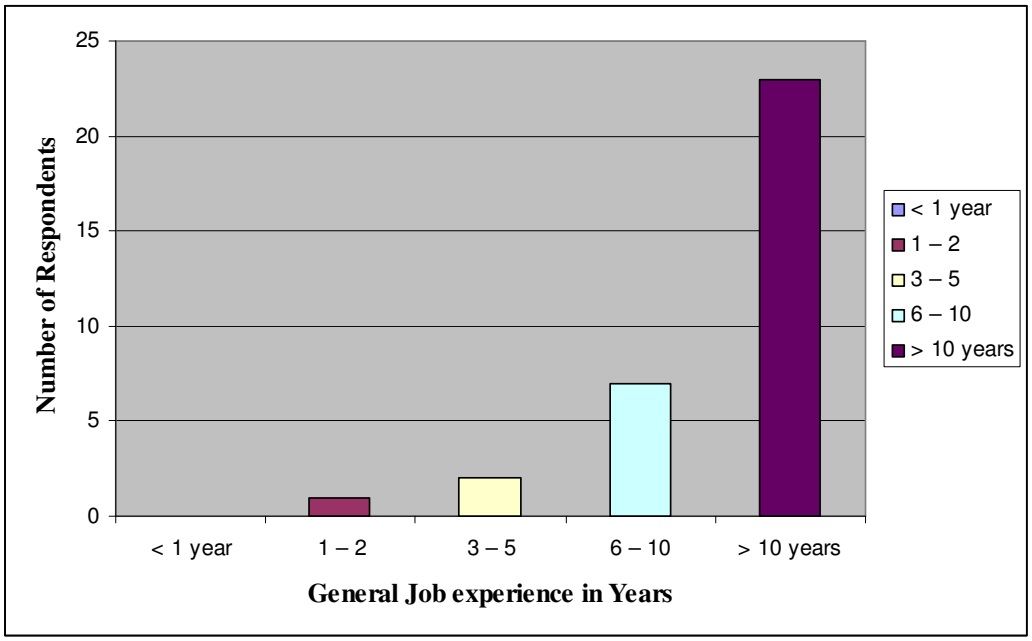

Figure 4-7: General Job Experience

As indicated in Table 4-9 and Figure 4-7, none of the respondents had general work experience of less than a year. Only one (n=1 or 3%) of the respondents had been working for less than two years. Two (n=2 or 6%) of the respondents have been working for between 3 and 5 years, while seven (n=7 or 21%) of the respondents had been working for 6 to 10 years. Most of the respondents, that is 23 (n=23 or 70%) had been working for more than 10 years.

4.5.5 Project Management Experience

Project management experience (in years)	Number of respondents
< 1 year	2
1 – 2	3
3 – 5	8
6 – 10	14
> 10 years	6

Table 4-10: Project Management Experience

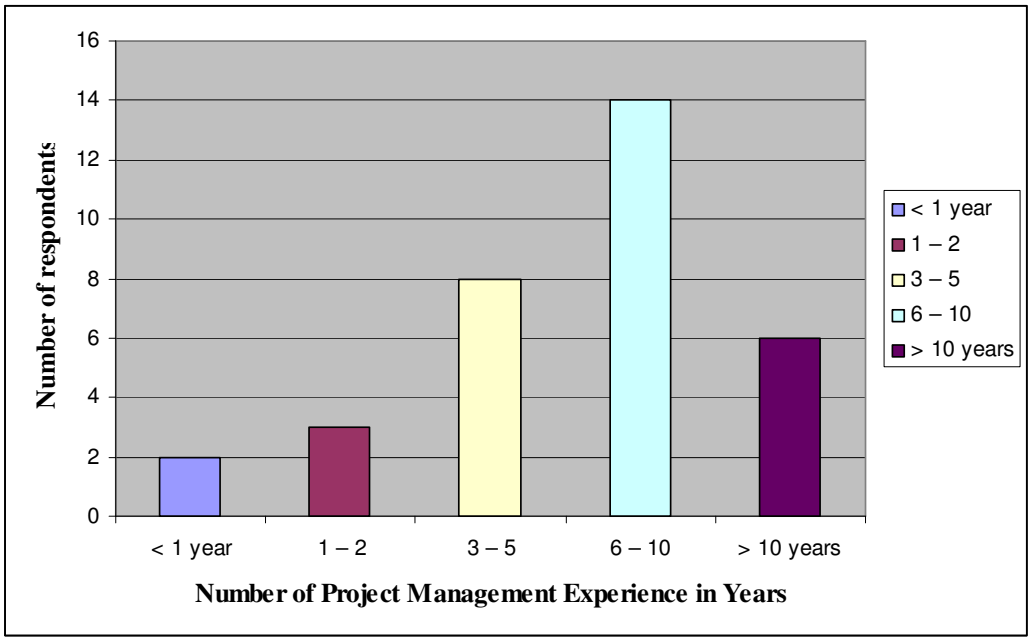

Figure 4-8: Project Management Experience

As indicated in Table 4-11 and Figure 4-8, two (n=2 or 6%) of the respondents had less than one year's project management experience and three (n=3 or 9%) had between 1 and 2 years job experience. Eight (n=8 or 24%) of the respondents had been project managers for 3 to 5 years. Most respondents, 14 in all (n=14 or 42%) had been project managers for 6 to 10 years, while six (n=6 or 18%) had been project managers for over 10 years.

4.5.6 ICT Project Management Experience

Project management experience (in years)	Number of respondents
< 1 year	7
1 – 2	2
3 – 5	10
6 – 10	9
> 10 years	5

Table 4-11: ICT Project Management Experience

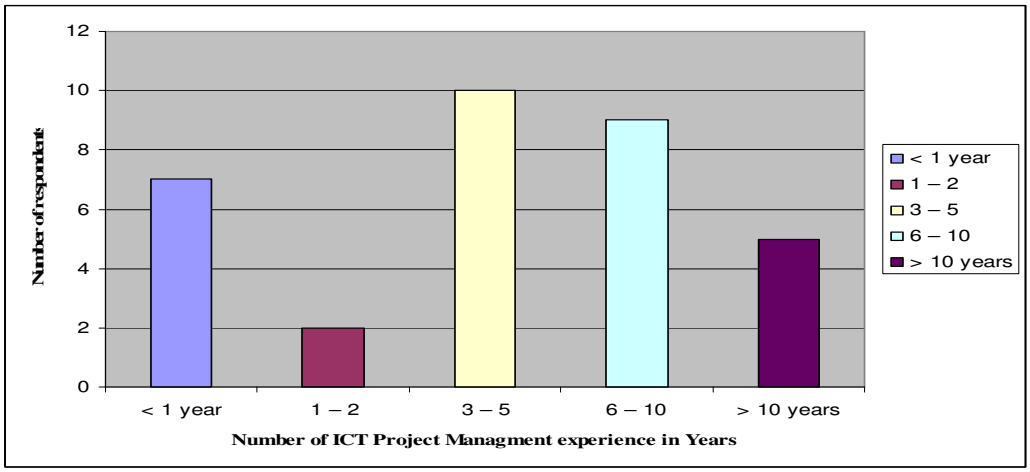

Figure 4-9: Number of ICT Project Management Experience

As indicated in Table 4-11 and Figure 4-9, seven (n=7 or 21%) of the respondents had been project managers in the ICT sector for less than a year. Two (n=2 or 6%) of the respondents had been project managers in the ICT sector for 1 to 2 years. Most of the respondents 10 that is, (n=10 – 30) have been project managers in the ICT sector for 3 to 5 years, followed by nine (n=9 or 27%) who have been ICT project managers for 6 to 10 years. Only five (n=5 or 15 %) had been project managers in the ICT sector for over 10 years.

4.5.7 Acquisition of ICT Project Management Skills

Acquisition of ICT project management skills	Number of respondents
Risen through the ranks	4
Accidental PM	4
Formal education	4
On-the-job training	5
Self study	2
Aptitude and ability	3
Formal education and on-the-job training	4
Formal education and aptitude and ability	3
Risen through the ranks, formal education and on-the-job training	1
Risen through the ranks, formal education, on-the-job training and aptitude and ability	1
Risen through the ranks, on-the-job training, self study and aptitude and ability	1
Risen through the ranks, accidental PM, formal education, on-the-job training, self study and aptitude and ability	1

Table 4-12: Acquisition of ICT Project Management Skills

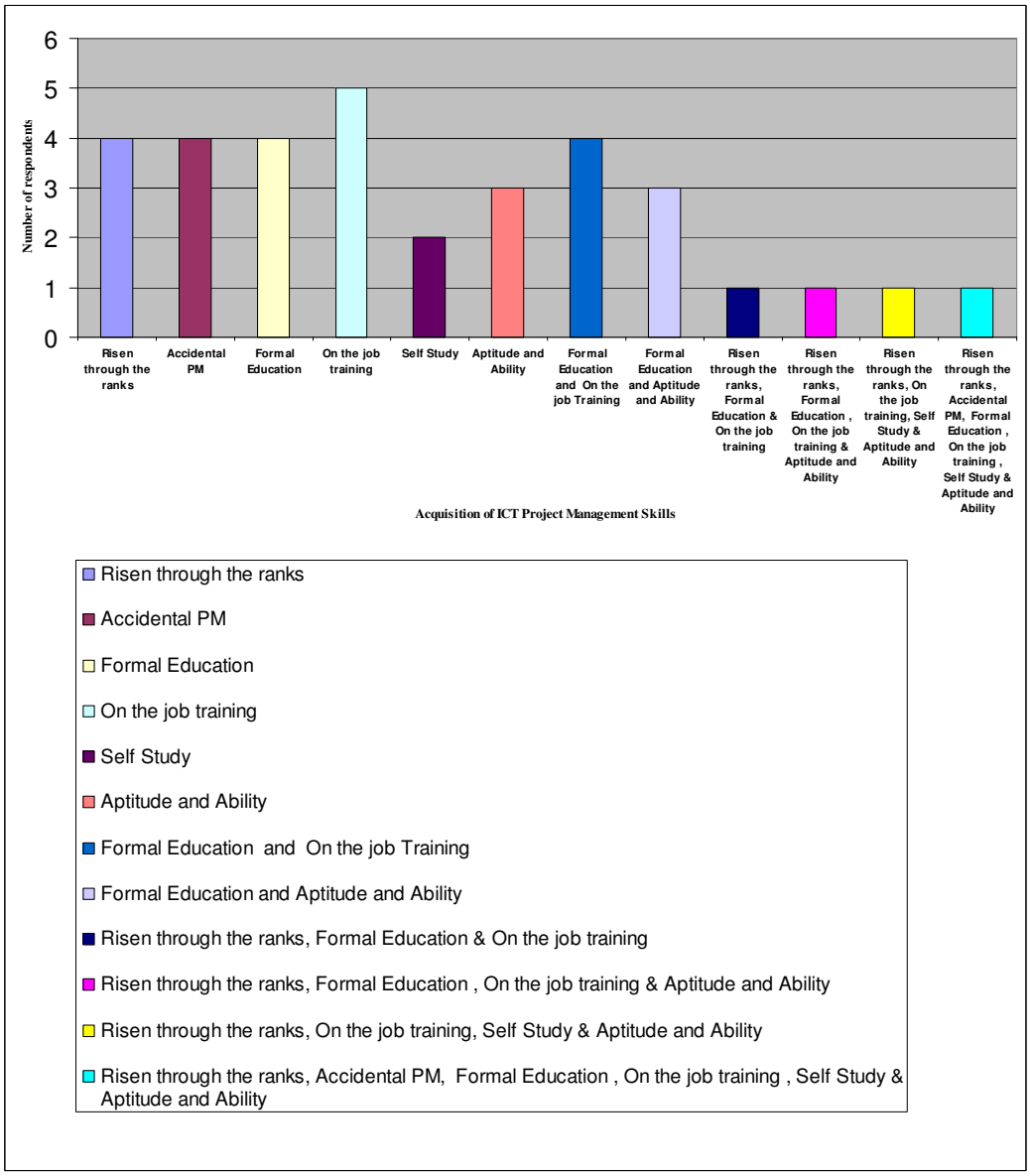

Figure 4-10: Acquisition of ICT Project Management Skills

As indicated in Table 4-12 and Figure 4-10, four (n=4 or 12%) of the respondents became ICT project managers through promotion (risen through the ranks), another four (n=4 or 12%) became project managers accidentally, the other four (n=4 or 2 %) through formal education, while five (n=5 or 15%) of the respondents became ICT project managers through on-the-job training. Two (n=2 or 6%) became ICT project managers through self study. Three (n=3 or 9%) became ICT project managers through aptitude and ability. The other 11 respondents (n=11 or 33%) became ICT project managers through a

combination of the following factors: risen through the ranks, formal education and on-the-job training or formal education and aptitude and ability or formal education and on-the-job training.

4.6 Project Management Training and Development

4.6.1 Management Support for PM Training and Development

Yes	No	Uncertain
24	5	4

Table 4-13: Management Support for PM Training and Development

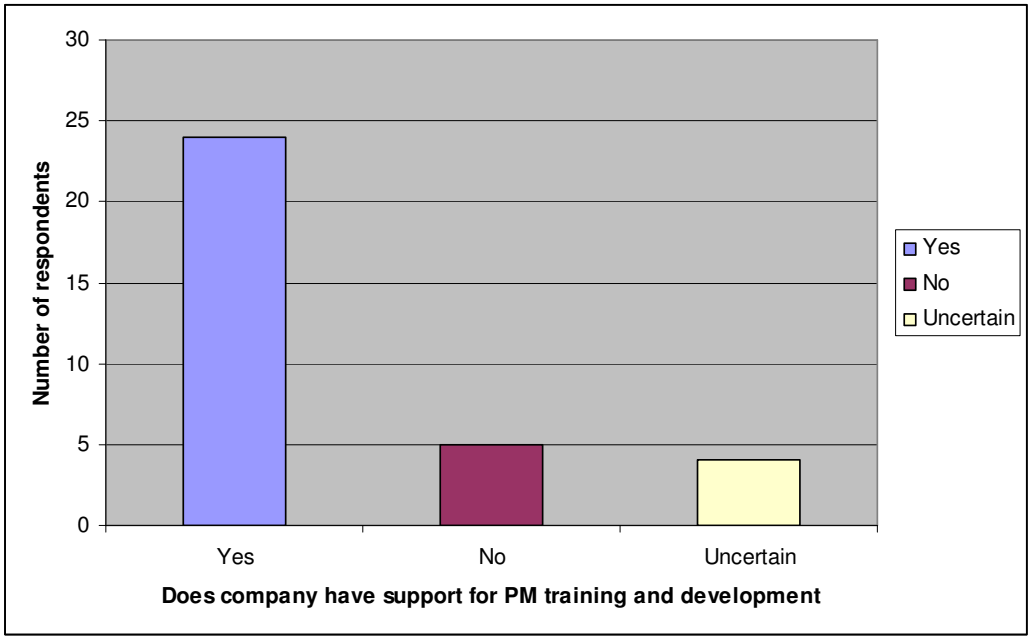

Figure 4-11: Support for PM Training and Development

As indicated in Table 4-13 and Figure 4-11, 24 respondents (n=24 or 73%) indicated that their company has managerial support for training and development of project manager competencies, while five (n=5 or 15%) indicated that their companies are not supportive of training and development of project management competencies. Four (n=4 or 12%) of the respondents were uncertain about whether their company is supportive of training and development of project management competencies or not.

4.6.2 Project Management Approach

Project management approach	Number of respondents
None	2
PMBOK	25
PRINCE2	2
CPPMBOK	0
Other (company own methodology)	2
PMBOK and PRINCE2	2

Table 4-14: Project Management Approach

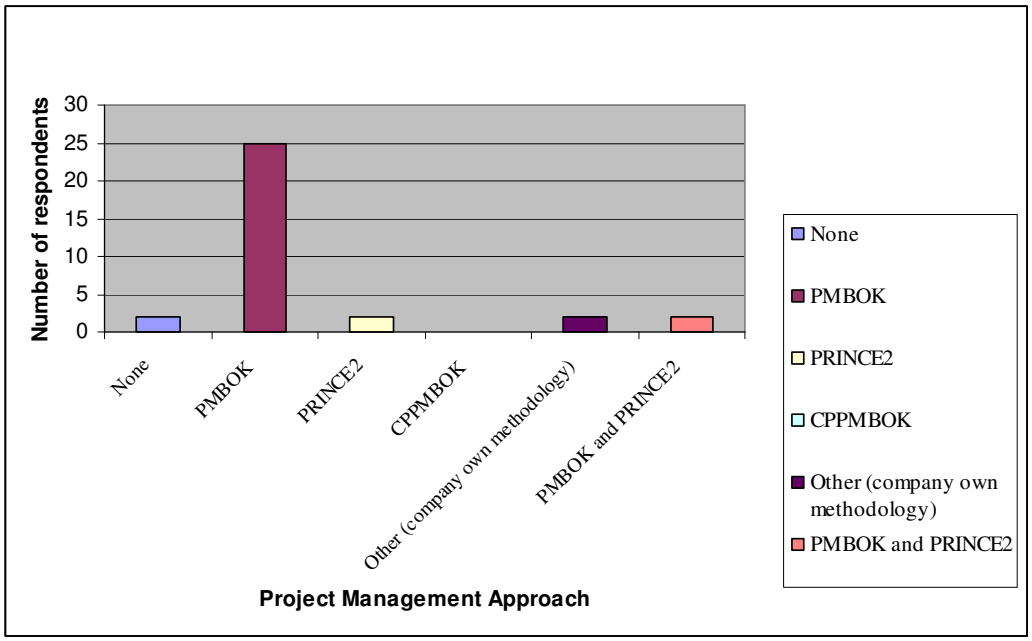

Figure 4-12: Project Management Approach

As indicated in Table 4-14 and Figure 4-12, two (n=2 or 6%) of the respondents indicated that their companies have not adopted any project management approach for their ICT projects. Twenty six respondents (n=26 or 76%) adopted a PMBOK approach. Two (n=2 or 6%) respondents indicated that they have adopted a PRINCE2 approach. None of the respondents utilise the CPPMBOK approach. Two (n=2 or 6%) adopted both PMBOK and PRINCE2 as their approach, while the last two (n=2 or 6%) adopted their own company's specific approach with some influence from PMBOK, PRINCE2, and others.

4.6.3 Payment for Project Management Training and Development

Myself	My Company	Both my company and Myself
6	23	4

Table 4-15: Payment for Project Management Training and Development

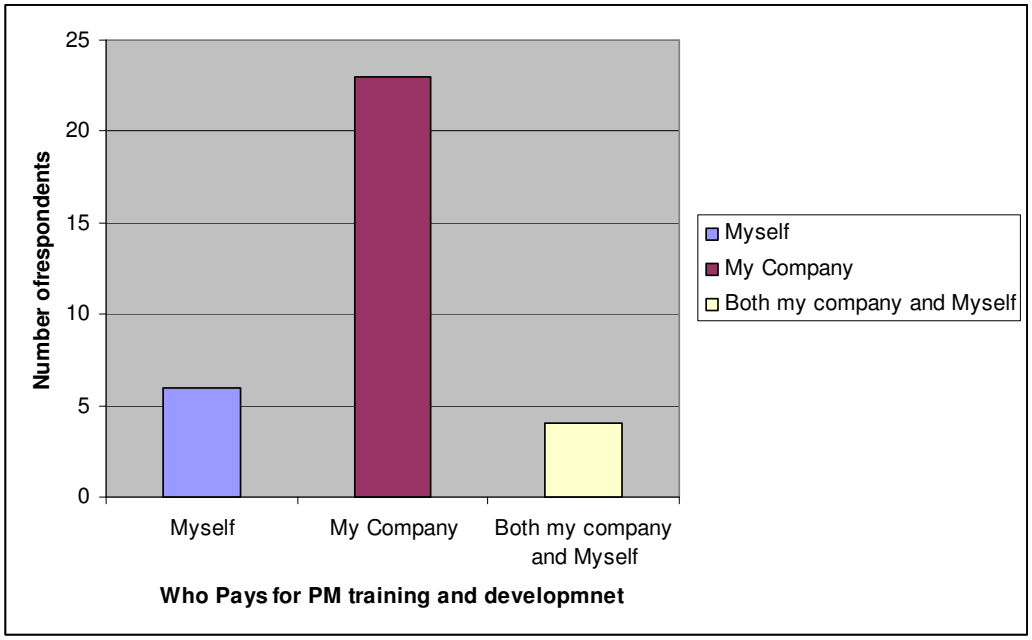

Figure 4-13: Who pays for PM Training and Development

As indicated in Table 4-15 and Figure 4-13, six (n=6 or 18%) of the respondents indicated that they have paid for their project management development and training, while 23 (n=23 or 70%) of the respondents indicated that their companies had paid for their project management training and development. Four (n=4 or 12%) of the respondents', project management training and development was paid for by both the company and the respondent jointly.

4.6.4 Project Management Training Method

Project management training method	Number of respondents
Workshops and seminars	3
On-site training	5
Off-site training	12
e-learning	0
All of the above	3
Off-site training and e-learning	2
On-site training and off-site training	1
Other (including 3rd party)	2
Workshops and seminars and off-site training	2

Table 4-16: Project Management Training Method

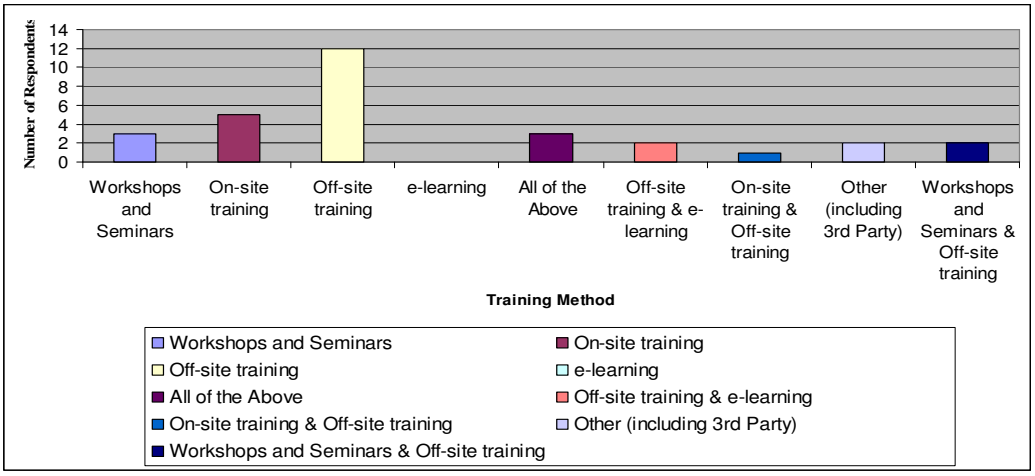

Figure 4-14: Training Method

As indicated in Table 4-16 or Figure 4-14, three (n=3 or 9%) of the respondents use workshops and seminars as their training method for development of project management competencies, while five (n=5 or 15%) of the respondents use on-site training. Twelve respondents (n=12 or 36%) use off-site training as a method of project management training and development. None of the respondents indicated the use of solely e-learning as a development tool. Three (n=3 or 9%) indicated that they utilise all of the mentioned training methods, workshops and seminars, e-learning and on- and off-site training. The other seven (n=7 or 21%) respondents utilise a combination of these training methods mentioned for example off-site and e-learning or on-site training and off-site training.

4.6.5 Project Management Training Undertaken

Project management training method	Number of respondents
None	0
PM fundamentals	3
PM intermediate	2
Advanced PM training	19
Other	5
PM fundamentals, intermediate and advanced training	4

Table 4-17: Project Management Training Undertaken

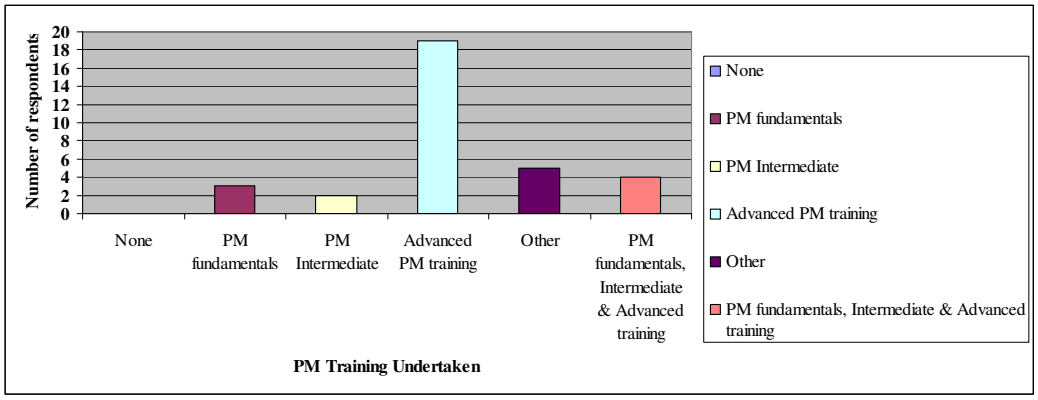

Figure 4-15: Project Management Training Undertaken

As indicated in Table 4-17 and Figure 4-15, none of the respondents indicated that they undertook no level of project management training. Three (n=3 or 9%) of the respondents had taken project management fundamentals training. Two (n=2 or 6%) of the respondents had undertaken project management intermediate training and 19 of the respondents (n=19 or 56 %) had taken advanced project management training. Five (n=5 or 15%) indicated that they had not undertaken fundamental, intermediate or an advanced project management course, but did project management as a course as part of their degree or postgraduate degree. The other four (n=4 or 12%) indicated that they had undertaken all three levels of project management training (fundamental, intermediate and advanced project management training).

4.7 Project Management Competence and Attributes

Table 4-18 indicates the responses for Section 4 of the questionnaire (Appendix V)

Knowledge and understanding of project management principles, practices, disciplines and best practice methodologies			
Non-existent	Familiar	Competent	Expert
0	n=2 or 6%	n=18 or 55%	n=13 or 39%
Project techniques (PT):			
Non-existent	Familiar	Competent	Expert
n=1 or 3%	0	n=21or 64%	n=11 or 33%
Managing Project Execution			
Non-existent	Familiar	Competent	Expert
0	0	n=15 or 45%	n=18 or 55%
Controlling techniques or (CT):			
Non-existent	Familiar	Competent	Expert
0	n=2 or 6%	n=17 or 51.5%	n=14 or 42.5%
Leadership and Behavioural aspects of PM (BAPM):			
Non-existent	Familiar	Competent	Expert
n=1 or 3%	n=1 or 3%	n=23 or 70%	n=8 or 24%
Communication:			
Non-existent	Familiar	Competent	Expert
0	n=3 or 9%)	n16 or 48.5	n=14 or 42.5%
Competency with regard to following up with role players regarding minuted actions and due dates			
Non-existent	Familiar	Competent	Expert
0	n=2 or 6%	n=19 or 58%	n=12 or 36%
Competency with regards to managing relationships with line- and other role players			
Non-existent	Familiar	Competent	Expert
0	n=1 or 3%	n=18 or 55%	n=14 or 42.5%
Interpersonal Skills			
Non-existent	Familiar	Competent	Expert
0	0	n=22 or 67%	n=11 or 33%
General analytical ability: problem solving; decision Making; root cause analysis; solving complex problems by using systems thinking, conceptual, logical and methodical			
Non-existent	Familiar	Competent	Expert
0	1= or 3%	n=24 or 73%	n=8 or 24%
Project Cost Management			
Non-existent	Familiar	Competent	Expert
n=1 or 3%	n=3 or 9%	n=23 or 70%	n=6 or 18%
Project Time Management			
Non-existent	Familiar	Competent	Expert
n=1 or 3%	n=3 or 9%	n=19 or 58%	n=10 or 30%
Marketing and Customer Issues			
Non-existent	Familiar	Competent	Expert
0	n=2 or 6%	n=23 or 70%	n=8 or 24%
Creating an environment for successful projects			
Non-existent	Familiar	Competent	Expert
n=1 or 3%	n=6 or 18%	n=24 or 73%)	n=2 or 6%
Organisational issues (OI): Rate your ability to manage across organizations when the PM has all the responsibility and little authority.			
Non-existent	Familiar	Competent	Expert
n=1 or 3%	n=7 or 21%	n=23 or 70%	n=2 or 6%

Table 4-18: Project Management Competence and Attributes

4.8 Recognition of Benefits of Project Management

4.8.1 Recognition of Project Management as Career Path

Does your company recognise project management as a career position?		
Yes	No	Uncertain
29	2	2

Table 4-19: Recognition of Project Management as Career Path

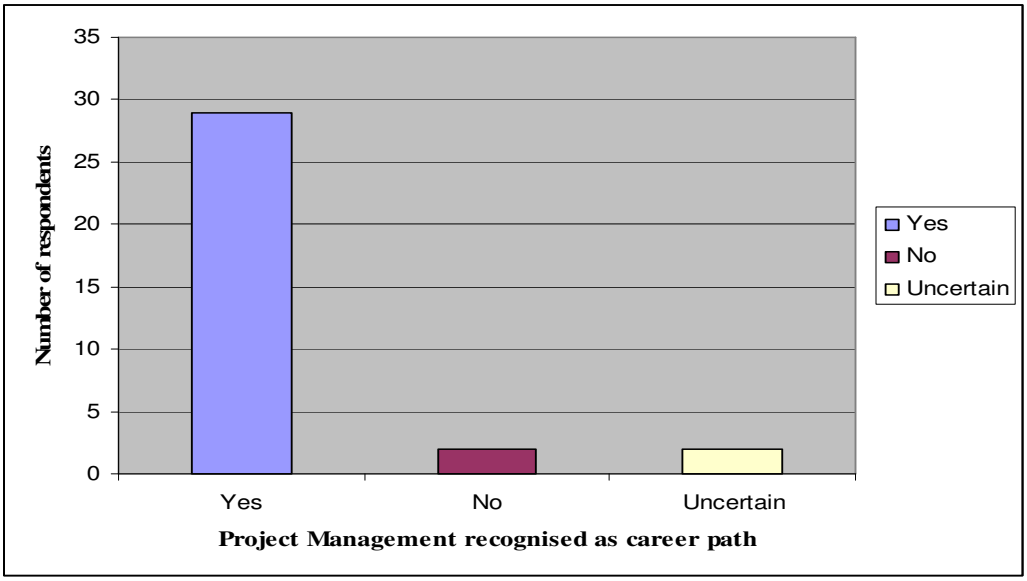

Figure 4-16: Recognition of Project Management as Career Path

As indicated in Table 4-18 and Figure 4-16, 29 of the respondents (n=29 or 88%) indicated that project management is recognised as a career path in their companies. Two (n=2 or 6%) respondents said project management is not recognised as a career path in their companies, while the other two (n=2 or 6%) were uncertain as to whether project management is recognised as a career path at their companies or not.

4.8.2 Project Management Need

Is there a need for project management at your company?		
Yes	No	Uncertain
30	1	2

Table 4-20: Project Management Need

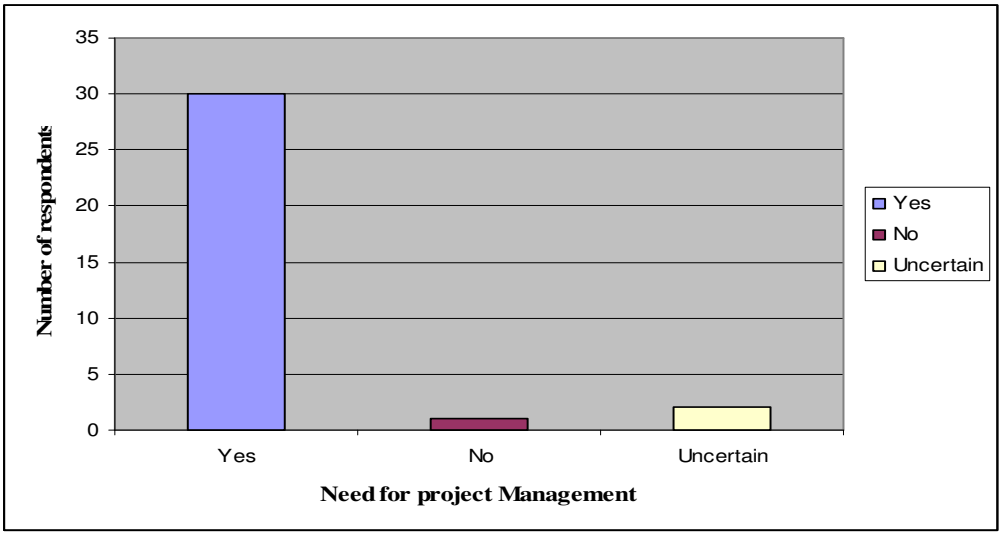

Figure 4-17: Need for Project Management

As indicated in Table 4-19 and Figure 4-17, 30 of the respondents (n=30 or 91%) indicated that there is a need for project management in their companies. Only one (n=1 or 3%) indicated that there is no need for project management in his/her company. Two (n=2 or 6%) were uncertain as to whether there is a need for project management or not.

4.8.3 Project Management Support Provided by Company

Project management support provided	Number of respondents
None	2
Project Management Office (PMO)	11
Project management centre of excellence (PMCOE)	2
PM directives, policies and procedures or project support systems	2
Other	1
PMO and PMCOE	2
PMO and PM directives, policies and procedures **or** project support systems	8
PMO, PMCOE and PM directives, policies and procedures **or** project support systems	5

Table 4-21: Project Management Support Provided by Company

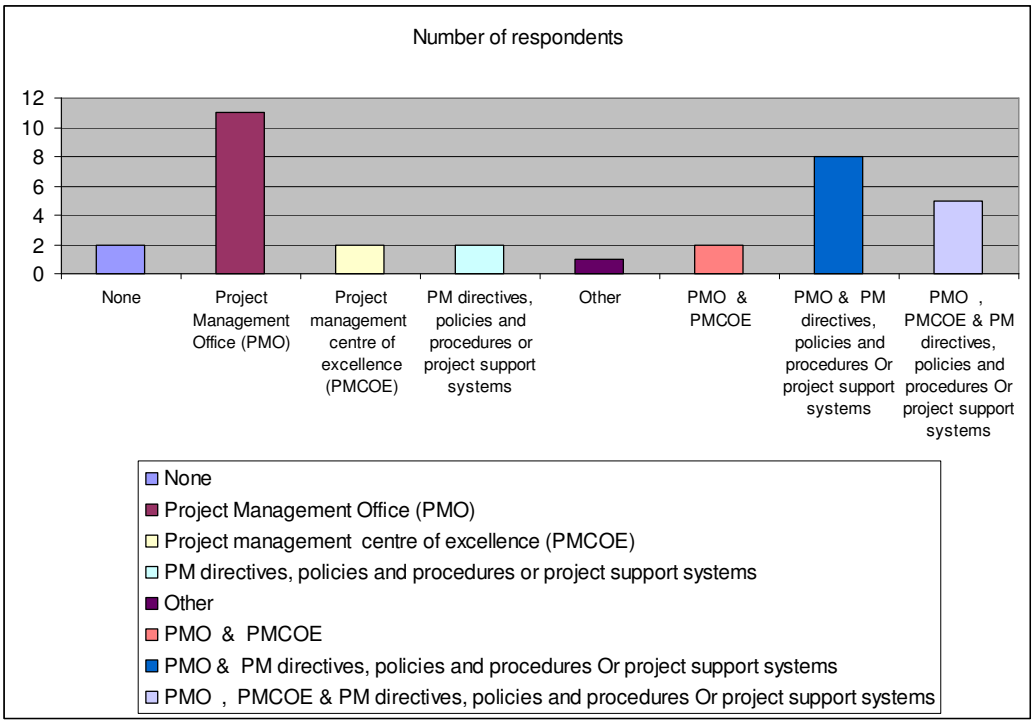

Figure 4-18: Project Management Support Provided by Company

As indicated in Table 4-20 and Figure 4-18, two (n=2 or 6%) of the respondents indicated that there are no structures in place for project management support. Eleven of the respondents (n=11 or 33%) indicated that they have a PMO in their companies. Two (n=2 or 6%) of the respondents have PMCOE. The other two (n=2 or 6%) have project management directives, policies and procedures or project support systems in place. Only one respondent indicated other. This points to the fact that he is self-employed and therefore this question was not applicable to him. Two (n=2 or 6%) have both PMO and PMCOE in place. Eight (n=8 or 24%) have PMO and PM directives, policies and procedures or project support systems, while the other five respondents (n=5 or15%) have all the support systems in place (PMO, PMCOE and PM directives, policies and procedures or project support systems).

4.8.4 Effectiveness of Project Management in a Company

Effectiveness of project management	Number of respondents
None	0
Adds value to the organisation	7
Effectiveness of relationship with peers in achieving project goals	3
Adds value to the client	8
Other	0
Adds value to the organisation and adds value to the client	3
Adds value to the organisation, adds effectiveness of relationship with peers in achieving project goals and adds value to the client	11
Effectiveness of relationship with peers in achieving project goals and adds value to the client	1

Table 4-22: Effectiveness of Project Management

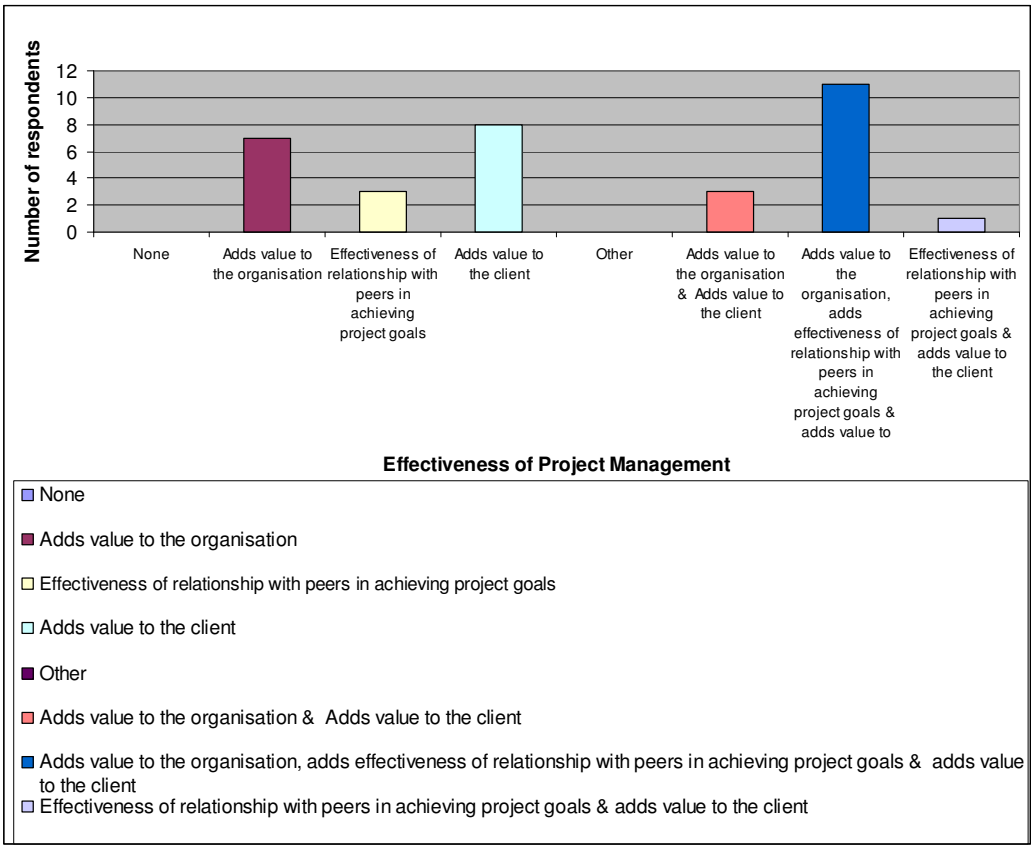

Figure 4-19: Effectiveness of Project Management

As indicated in Table 4-21 and Figure 4-19, none of the respondents indicated that project management does not have any effectiveness in their company. Seven (n=7 or 21%) of the respondents indicated that project management adds value to the organisation. Three (n=3 or 9%) respondents indicated that project management improves effectiveness of relationship with peers in achieving project goals. Eight (24%) said project management adds value to the client. The other three (n=3 or 9%) felt that project management adds value to both the organisation and the client. Eleven of the respondents (n=11 or 33%) indicated that project management is effective in that it adds value to both the organisation and the client and also adds effectiveness of relationship with peers in achieving project goals. One respondent (3%) indicated that project management adds effectiveness of relationship with peers in achieving project goals.

4.9 Summary

The presentation of raw results has been made in this chapter. Tables and graphs were used for close-ended questions. Interpretations of the results are given in the next chapter. Chapter 5 discusses the findings in more detail and leads to conclusions and recommendations.

Chapter 5

RESEARCH ANALYSIS AND SYNTHESIS

Chapter four presented the research results

This chapter

discusses the research findings and provides analyses and interpretations of data as well as testing of the hypothesis.

5 CHAPTER 5: RESEARCH SYNTHESIS AND ANALYSIS

5.1 Introduction

Chapter 4 presented research findings and in this chapter the researcher discusses analyses and interpretations of data and testing of hypotheses.

5.1.1 Data Description

In the survey, certain specific questions were asked (see Appendix V) with four hypotheses to be tested at the end. The analysis is also based on the following:

- Frequency Distributions
- P-Value

Frequency Distributions

Both absolute and relative frequency distributions for each of the variables on the survey, as per the different values, have been calculated.

P Value

P-value is the probability of obtaining a result at least as extreme as the one that was actually observed, given that the null hypothesis is true.

5.1.2 Hypotheses

Hypothesis testing is to establish whether a particular proposition that concerns a population will be true or not. When there is one hypothesis based on chance, the other one is based on the probability that there is a possibility that the statement/s is/are true. This means that if one supports a particular hypothesis, one is automatically rejecting the other one (Diamantopoulos and Schlegelmilch, 2005). The two hypotheses can be classified into the null hypothesis and the alternative hypothesis.

Null Hypothesis

The null hypothesis is characterised by the inclusion of a possibility of no difference between the values being tested and always includes a statement of equality. A Chi-square is used to test or validate the hypothesis. This test of independence was selected since the results were categorical.

Alternative Hypothesis

This is the hypothesis that can never include a statement of equality. This kind of hypothesis can never be tested directly and this is the reason why respective null hypotheses emanating from the alternative hypotheses are the ones to be tested.

Chi-square distribution

According to Diamantopoulos and Schlegelmilch (2005), a Chi-square is a distribution obtained from multiplying the ratio of sample variance with population variance by the degrees of freedom when random samples are selected from a normally distributed population

$$\chi^2 = \frac{(n-1)s^2}{\sigma^2} = \frac{df \cdot s^2}{\sigma^2}$$

The chi-square (χ^2) distribution is obtained from the values of the ratio of the sample variance and population variance multiplied by the degrees of freedom. This occurs when the population is normally distributed with population variance sigma^2.

Properties of the Chi-Square

- Chi-square is non-negative. It is the ratio of two non-negative values, therefore it must be non-negative.
- Chi-square is non-symmetric.
- There are many different chi-square distributions, one for each degree of freedom.
- The degrees of freedom when working with a single population variance is n-1 (Diamantopoulos and Schlegelmilch, 2005).

Hypotheses Listing and Classification

The research tested four hypotheses. Each hypothesis was formulated to reflect the null and alternative hypothesis.

This chapter tested the following hypotheses:

Hypothesis	Null Hypothesis (H_0)	Alternative Hypothesis
H1	Project Management is not recognised as an important profession in the ICT sector.	Project Management is recognised as an important profession in the ICT sector.
H2	There are no special attributes required to become an ICT project manager.	There are special attributes required to become an ICT project manager.
H3	To be an ICT project manager, the background (qualification and experience) is not important.	To be an ICT project manager, the background (qualification and experience) is important.
H4	Project management does not increase the effectiveness of projects in the ICT sector.	Project management increases the effectiveness of projects in the ICT sector.

Table 5-1: Hypothesis Listing and Classification

5.1.3 Specification of Significance Level

The significance level (α) for each of the null hypotheses (H_{01} to H_{04}) was set at 5%. The significance level was kept this low to increase the possibility of reaching a correct decision pertaining each of the hypotheses. Thus, each null hypothesis (H_{0i}) was tested against a significance level of 5%.

	Situation in population
Decision made	**(H_0 is True)**
H_{0i} is not rejected	$\alpha > 0.05$
H_{0i} is rejected	$\alpha \leq 0.05$

Table 5-2: Significance level applicable to all hypotheses

5.2 Biographical Information

Some additional biographic information was collected to give an overview of the type and experience of the participants:

- Gender and age range of respondents
- Project management designation of respondents

The largest percentage of respondents taking part in this survey (61%) was found to be in their thirties. It was also found that 18% were 41 years old or above and 21% were under 30.

Those persons who took the survey were predominantly females (51.5%). Although this is not indicative of the proportion of the gender of project managers in the ICT sector, it is still a significant observation. Most of the respondents (45%) held the designation of project managers; only about 3% were junior project managers with just one project coordinator. 18% of the respondents were senior project managers, while 15 % were programme managers managing a group of related projects.

A general trend which was observed in the results when using Chi-square was that there was some relationship between the designations of the project managers and their age. Those respondents who were below the age of 30 are mostly junior project managers while most of those who are between 31–40 are project managers with the majority of those above 40 being senior project managers. This could be attributed to years of ICT job experience.

The other noticeable relationship was between the years of ICT project management experience and the designation of project managers. Most respondents with longer ICT project management experience are senior project managers, while those with less ICT job experience are junior project managers.

An observation that could be made based on these results is that in the ICT sector one does not just start being a project manager at a very young age. It seems that as persons progress in their career, they either accidentally become or get promoted to project managers and start from the ranks of being a junior project manager, moving up to project manager and eventually senior project manager or programme manager.

5.3 Project Management is Recognised as an Important Profession in the ICT Sector (H_{01})

The following five questions answered H_{01}:

- Does your company recognise project management as a career path?
- Is there a need for project management at your company?
- Is project management support provided by your company?
- Is there management support for project management training and development?
- Who pays for project management training and development?

Variables	Values	Absolute Frequency	Relative Frequency (%)
Recognition of project management as a career path	1 (Yes)	29	88%
	2 (No)	2	6%
	3 (Uncertain)	2	6%
		33	**100.0%**
Need for project management	1 (Yes)	30	91%
	2 (No)	1	3%
	3 (Uncertain)	2	6%
		33	**100.0%**
Project management support provided by company	1 (None	2	6%
	2 Project Management Office	11	33%
	3 (Project management centre of excellence [PMCOE])	2	6%
	4 (PM directives, policies and procedures or project support systems)	2	6%
	5 (Other)	1	3%
	6 (PMO and PMCOE)	2	6%
	7 (PMO and PM directives, policies and procedures Or project support systems)	8	24%
	8 (PMO, PMCOE and PM directives, policies and procedures or project support systems)	5	15%
		33	**100.0%**
Payment for PM training and development	1 (Self)	6	18%
	2 (Company)	23	70%
	3 (Both)	4	12%
		33	**100.0%**

Table 5-3: Frequency Distribution for H_{01}

5.3.1 Analysis and Synthesis for H_{01}

An observation that was made based on the results as tabulated in Table 5-3 above is that an overwhelming majority of respondents (88%) indicated that project management is recognised as a career path at their companies. 91% of the respondents confirmed this by indicating that there is a need for project management in their companies.

Since project management is recognised as a career path and there is also a definite need for project management in the companies of respondents, the expectation is that there should be measures in place to provide project management support. The results of the survey indicated that only 6% of respondents have no project management support in place in their companies. The rest of the respondents indicated that they do get some kind of project management support, be it PMO, PMCOE, PM directives or policies and procedures or project support systems that are in place. This is a clear indication that indeed since project management is recognised as an important profession, measures are in place to support project managers in ensuring that PM delivers quality projects that meet all the performance measurement standards.

When asked if their companies support project management training and development, 73% of respondents said yes, with only 15% indicating a no and 12% who were uncertain. This is another indication that project management is supported in their companies.

To show their recognition of project management as a career path companies pay for project management training and development. In some cases there was a joint contribution towards payments for training and development by both the company and the respondent.

The growing importance of ICT project management is reflected by the positive nature of the results of the survey from those who took part in the

survey. The results give an indication that project management is recognised as an important profession in the ICT sector. This is due to the fact that project management is becoming increasingly important in almost every kind of organisation today. As projects become more and more complex, and as more organisations move to management by projects, there is an increasing demand for competent project managers. Employers need guidance to help them select, develop and support competent project personnel. Project managers and team members need goals for achievement of competence as well as recognition for excellence which will assist them in their careers.

5.3.2 Hypothesis Testing for H_{01}

In testing the hypothesis that project management is recognised as an important profession in the ICT sector, H_{01} null hypothesis was rejected at alpha 0.05, (p-value < 0.05). Thus, for the sample analysed, and based on the clustering of responses in Table 5-3, it appears that indeed project management is recognised as an important profession.

When a cross tabulation test was done to further validate the hypothesis using Chi-square to test for independents, it was found that:

The respondents who have PM certification as their PM qualification responded that the company is paying for their PM certification, and also those with PM postgraduate degrees indicated that payment was made by their respective companies. This is an indication that since companies have a vested interest in PM and recognise it as a career path; they pay towards training and development of project managers.

Another observation which was made on the Chi-square test was that the majority of respondents with undergraduate degrees paid for their studies, which is an indication that those respondents were unemployed while doing their undergraduate degree.

5.4 There are Special Attributes Required to Become an ICT Project Manager (H_{02})

The questions below were intended to assess the proficiency of the project manager to ascertain their individual skills for successfully delivering project management services.

The following questions answered H_{02}:

Technical Skills:

- Knowledge and understanding of Project Management principles, practices, disciplines and best practice methodologies
- Project techniques (PT): In your opinion what is your competency with regard to planning and scoping projects (for example running project definition workshops; writing project charters; project definition reports)
- Managing project execution
- Controlling techniques (CT)
- Project Cost Management
- Project Time Management

Organic and Conceptual Skills:

- Leadership and behavioural aspects of PM
- Communication
- Following up with role players regarding minuted actions and due dates
- Managing relationships with line- and other role players
- Interpersonal skills
- General analytical ability: problem solving; decision making

Business Skills

- Marketing and customer issues
- Creating an environment for successful projects
- Organisational issues

5.4.1 Project Management Technical Skills

Table 5-4 below is an indication of project managers' technical skills. These are skills of administration; the mechanics of planning, scheduling, purchasing, financial and operational control.

Variables	Values	Absolute Frequency	Relative Frequency (%)
Knowledge and understanding of Project Management principles	1 (Non-existent)	0	0%
	2 (Familiar)	2	6%
	3 (Competent)	18	55%
	4 (Expert)	13	39%
		33	**100.0%**
Project Techniques(PT)	1 (Non-existent)	1	3%
	2 (Familiar)	0	0%
	3 (Competent)	21	64%
	4 (Expert)	11	33%
		33	**100.0%**
Managing project execution	1 (Non-existent)	0	0%
	2 (Familiar)	0	0%
	3 (Competent)	15	45%
	4 (Expert)	18	55%
		33	**100.0%**
Controlling techniques(CT)	1 (Non-existent)	0	0%
	2 (Familiar)	2	6%
	3 (Competent)	17	51.5%
	4 (Expert)	14	42.5%
		33	**100.0%**
Project Cost Management	1 (Non-existent)	1	3%
	2 (Familiar)	3	9%
	3 (Competent)	23	58%
	4 (Expert)	6	18%
		33	**100.0%**
Project Time Management	1 (Non-existent)	1	3%
	2 (Familiar)	3	9%
	3 (Competent)	19	58%
	4 (Expert)	10	30%
		33	**100.0%**

Table 5-4: Frequency Distribution for H_{02} Technical Skill

5.4.1.1 Analysis and Synthesis for H_{02} - Project Management Technical Skills

It can be seen from the results in Table 5-4 that 55% of project managers who took part in the survey rate themselves as competent in terms of their knowledge (proficiency) and understanding of project management principles, practices and disciplines and best practices, followed by 39% who indicated that they are experts in this area. There were more high responses than low responses. Only 6% indicated that they are familiar with this attribute. The results show that 61% of respondents are competent with 33% indicating that they are experts with regard to project techniques.

The results imply that ICT project managers that took part in the survey have rooted knowledge and experience with project planning, estimating, risk analysis techniques and the ability to put together a project plan. Based on their competency, they are able to deal with risks, plan for risks, identify and analyse risk issues, develop a risk handling strategy and monitor those risks to determine how they have changed. The results indicate that project managers take considerable care when planning projects. They establish a set of directives in sufficient detail to tell the project team exactly what must be done, when it must be done and what resources to use in order to produce the deliverables of the project successfully.

45% of respondents indicated that they are just competent, while 55% indicated that they are experts in terms of managing project execution. This implies that both groups of respondents have good and advanced capabilities of status reporting, handling status meetings, ensuring that deliverables are of high quality and that the project is within budget. This again implies that ICT project managers can direct the performance of planned project activities and manage various technical and organisational interfaces that exist within the project.

When asked about their competency with regard to their controlling technique, only two out of 33 respondents (6%) indicated that they have a basic capability with the technique, that they cannot mentor or guide others in terms

of the technique. 51.5% indicated that they are competent and 42.5% indicated that they are experts. This implies that project managers who took part in the survey have a good or a deep knowledge and experience with regard to conducting project reviews, have advanced meeting skills, good project audit techniques and project close-out techniques.

5.4.2 Project Management Organic and Conceptual Skills

This section measures project managers' organic skills such as leadership and communication skills, as well as conceptual skills to measure the ability to visualise physical relationships and positioning.

Variables	Values	Absolute Frequency	Relative Frequency (%)
Leadership and behavioural aspects of PM (BAPM)	1 (Non-existent)	1	3%
	2 (Familiar)	1	3%
	3 (Competent)	23	70%
	4 (Expert)	8	24%
		33	**100.0%**
Communication	1 (Non-existent)	0	0%
	2 (Familiar)	3	9%
	3 (Competent)	16	48.5%
	4 (Expert)	14	42.5%
		33	**100.0%**
Competency with regard to follow up with role players regarding minuted actions	1 (Non-existent)	0	0%
	2 (Familiar)	2	6%
	3 (Competent)	19	58%
	4 (Expert)	12	36%
		33	**100.0%**
Competency with regards to managing relationships with line and other role players	1 (Non-existent)	0	0%
	2 (Familiar)	1	3%
	3 (Competent)	18	48.5%
	4 (Expert)	14	42.5%
		33	**100.0%**
Interpersonal skills	1 (Non-existent)	0	0%
	2 (Familiar)	0	6%
	3 (Competent)	22	67%
	4 (Expert)	11	33%
		33	100.0%
General analytical ability: problem solving; decision making	1 (Non-existent)	0	0%
	2 (Familiar)	1	3%
	3 (Competent)	24	73%
	4 (Expert)	8	24%
		33	**100.0%**

Table 5-5: Frequency Distribution for H_{02} Organic Skill

5.4.2.1 Analysis and Synthesis for H_{02} Project Management Organic and Conceptual Skills

The literature review indicated that everyone has some kind of organic skills but in some people the organic skills are better developed and more effective than in others. Organic skills include interpersonal skills such as leadership ability. The project manager must have the ability to inspire, motivate team members, influence others, be able to develop effective project teams and deal with upper managers, contributing department managers and other stakeholders. As can be seen in Table 5-5, the survey in terms of leadership and behavioural aspects indicates that only one of the respondents who took part in the survey indicated that this attribute is none existent, that is no capability at all, with another who responded by indicating that he/she is familiar with this attribute. Most of the respondents, 70% in all indicated competency while 24% claimed to be experts. From these results it can be deduced that ICT project managers have advanced leadership capabilities.

A project manager needs to communicate well verbally and in writing in and outside of the project. Communication problems have been identified as a major source of project failure. Only 9% of respondents indicated that they have a basic capability with this skill. 48.5% indicated that they are competent while 42.5 % said they are experts. This is an indication that ICT projects also need an advanced communication skill which forms part of the interpersonal skills required to make a good project manager.

A project manager must be able to identify and understand problems, place them in perspective and then develop and implement solutions. A project manager must have general analytical, problem solving and decision making abilities, be able to do root cause analysis, solve complex problems by using systems thinking, and be conceptual, logical and methodical. The survey indicated that of those who took part, only one responded as having only a basic capability with regard to this attribute, while 73% are competent and 24% are experts.

5.4.3 Project Management Business Skills

This section measures the project manager's ability to understand the business of the organisation, whether he/she knows how decisions affect the bottom line, and whether he/she knows how to run a project as if it was a business. It also assesses the skills of being able to define and develop a market; understanding the needs and desires of the project's customers and end users and lastly it also measures the ability to create the project environment, being able to change to a project-based organisation.

Variables	Values	Absolute Frequency	Relative Frequency (%)
Marketing and customer issues	1 (Non-existent)	0	0%
	2 (Familiar)	2	6%
	3 (Competent)	23	70%
	4 (Expert)	8	24%
		33	**100.0%**
Creating an environment for successful projects	1 (Non-existent)	1	3%
	2 (Familiar)	6	18%
	3 (Competent)	24	73%
	4 (Expert)	2	6%
		33	**100.0%**
Organisational issues	1 (Non-existent)	1	3%
	2 (Familiar)	7	21%
	3 (Competent)	23	70%
	4 (Expert)	2	6%
		33	**100.0%**

Table 5-6: Frequency Distribution for H_{02} Business Skills

5.4.3.1 Analysis and Synthesis for H_{02} -Project Management Business Knowledge

As is clear from Table 5-6, 73% and 6% respectively of respondents indicated that they are competent and expert in terms of creating an environment for successful projects. Only 18% indicated that they have a basic capability but that they are not competent in developing a core team process, developing PM in the organisation, understanding upper management influence, developing a learning organisation or developing a PM information system.

From those that took part in the survey 21% and 3% respectively indicated that they have little capability to no capability at all regarding the organisational issues attribute. 70% said they are competent while 6% said they are experts. They have deep capabilities with regard to the technique for managing across organisations when they have all the responsibility and little authority.

The above findings strongly suggest that the attributes that ICT project managers possess are no different from any other project manager. Those who took part in the survey displayed good interpersonal skills, conceptual skills, professional and specialist skills and knowledge and lastly mechanistic skills and knowledge.

5.4.4 Hypothesis Testing for H_{02}

In testing the hypothesis that there are no special attributes required to become an ICT project manager, H_{02} null hypothesis was rejected at alpha 0.05, (p-value < 0.05). Thus, for the sample analysed, and based on the clustering of responses within Table 5-6, it appears that special attributes are indeed required to become an ICT project manager.

A Chi-square test revealed that most of those respondents who were competent in terms of PM technical skills such as managing project execution, controlling technique, project technique, project cost management and time management were also competent in terms of softer skills such as communications, leadership and interpersonal skills. These project managers were also competent in terms of conceptual skills such as general analytical ability. Lastly the test indicated that they were competent in terms of strategic project management knowledge such organisational issues, marketing and customer issues and creating an environment for project success.

The conclusion that can be drawn from these findings is that although there is a high failure rate on ICT projects, ICT project managers have technical skills, interpersonal skills, conceptual skills and strategic project management knowledge.

5.5 *To be an ICT Project Manager, the background (Qualification and Experience) is important* (*H_{03}*)

The following questions answered H_{03}:

Qualifications:

- Highest educational qualification
- Highest project management qualification
- Project management certification

Job Experience

- General job experience
- Project management experience
- ICT project management experience

Acquisition of ICT PM Skills and PM Training

- Acquisition of ICT project management skills
- Project management approach adopted for the implementation for ICT projects
- Type of project management training undertaken
- Level of project management training undertaken

5.5.1 Project Management Qualifications

The qualifications include the highest qualification the responded has, highest project management qualification and the project management certification.

Variables	Values	Absolute Frequency	Relative Frequency (%)
Highest educational qualification	1 (> Grade 12)	0	0%
	2 (Grade 12)	2	6%
	3 (One-year post-matric qualification)	1	3%
	4 (Degree)	10	30%
	5 (Postgraduate degree)	20	61%
		33	**100.0%**
Highest project management qualification	1 (None)	8	24.3%
	2 (PM diploma)	8	24.3%
	3 (PM Postgraduate degree)	3	9%
	4 (Other)	14	42.5%
		33	**100.0%**
Project management certification	1 (None)	10	30%
	2 (PMP)	18	55%
	3 (CAPM)	0	0%
	4 (APMP)	0	0%
	5 (Other)	5	15%
		33	**100.0%**

Table 5-7: Frequency Distribution for H_{03} Qualifications

5.5.1.1 Analysis and Synthesis for H_{03} - Qualifications

In terms of highest educational qualification, it can be seen from Table 5-7 above, that a large proportion of respondents who completed the survey (61%) have been educated to postgraduate degree level. Around 30% have also obtained a degree. Only one respondent have a one year post-matriculation qualification while two respondents have grade 12 as their highest educational qualification. This is some sort of indication that most project managers have either degrees or postgraduate degrees. This does not necessarily imply that such degree or postgraduate degree is a project management degree. It could be a degree from other fields.

Regarding the question of highest project management qualification, the survey results showed that 24% of those who took part in the survey have no project management qualification. 24% have a project management diploma, and 9% a project management postgraduate degree. 42.5% have project management certification as their highest project management qualification. An interesting observation was that although 61% and 30% of the respondents have a postgraduate and a degree respectively, only 9% have this postgraduate degree in project management. This is an indication that those who took part in the survey studied for other professions and later studied for a project management diploma or certification to become professional project managers.

With regards to project management certification, 55% of project managers who took part in the survey had a professional project management certification, though some (15%) were in the process of studying for project management certification. 30% had no project management certification at all. This also further proves that since most ICT project managers have no project management degree or postgraduate degree, they take up project management certification.

5.5.2 Job Experience

Job experience includes the general job experience the respondent has accrued since he/she started working and project management experience which is the number of years the respondent has been a project manager. The latter not necessarily in the ICT sector and lastly also the number of years the respondent has been involved in ICT project management.

Variables	Values	Absolute Frequency	Relative Frequency (%)
General job experience	1 (< 1 year)	0	0%
	2 (1 – < 2 years)	1	3%
	3 (3 – < 5 years)	2	6%
	4 (6 – < 10 years)	7	21%
	5 (> 10 years)	23	70%
		33	**100.0%**
Project management experience	1 (< 1 year)	2	6%
	2 (1 – < 2 years)	3	9%
	3 (3 – < 5 years)	8	24.3%
	4 (6 – < 10 years)	14	42.5%
	5 (> 10 years)	6	18.2%
		33	**100.0%**
ICT project management experience	1 (< 1 year)	7	21%
	2 (1 – < 2 years)	2	6%
	3 (3 – < 5 years)	10	30%
	4 (6 – < 10 years)	9	27%
	5 (> 10 years)	5	15%
		33	**100%**

Table 5-8: Frequency Distribution for H_{03} Job Experience

5.5.2.1 Analysis and Synthesis for H_{03} - Job experience

As can be seen from Table 5-8 above, around 70% of respondents had over 10 years general job experience, 21% have been employed for 6 to10 years with only 9% having less than five years of general job experience.

Although 70% of respondents have over 10 years job experience, only 18.2% have been project managers for more than 10 years, with 42.5% being project managers for between 6 and 10 years. 24.3 % have been project managers for between 3 and 5 years with 15% being project managers for less than three years. This is an indication that the number of years project management experience tends to decrease with a decrease in job experience and that people do not just start off by becoming project managers even though they might be working for a while.

Another discovery from the results is that although 18% have been project managers for over 10 years, only 15% have been ICT project managers for over 10 years. 42.5% of those who took part in the survey have been project managers for between 6 and 10 years, however only 27% have been ICT project managers for between 6 and 10 years. 30% have been ICT project managers for between 3 and 5 years, while 29% have been ICT project managers for less than three years. This gives some kind of indication that although some project managers have been project managers for a while, they have less ICT project management experience. This implies that they were not always ICT project managers, but could have been project managers in other sectors. This may indicate that project management may be a relatively new discipline and that the respondents in the ICT sector survey have only recently started to embrace it as a management discipline

5.5.3 Acquisition of ICT Skills

This section assesses how the respondent became an ICT project manager. It also looks at the project management methodology adapted to implement projects and lastly the level of project management training undertaken.

.

Variables	Values	Absolute Frequency	Relative Frequency (%)
Acquisition of ICT project management skills	1 (Risen through the ranks or accidental PM)	8	24%
	2 (Formal education)	4	12%
	3 (On-the-job training)	5	15%
	4 (Self study)	2	6%
	5 (Aptitude and ability)	3	9%
	6 (Formal education and on the job training)	4	12%
	7 (Formal education and aptitude and ability)	3	9%
	8 (Risen through the ranks, formal education and on-the-job training)	1	3%
	9 (Risen through the ranks, formal education , on-the-job training and aptitude and ability)	1	3%
	10 (Risen through the ranks, on-the-job training, self study and aptitude and ability)	1	3%
	12 (Risen through the ranks, formal education , on-the-job training, self study and aptitude and ability)	1	3%
		33	**100.0%**
Project management approach adopted for the implementation of your ICT projects	1 (None)	2	6%
	2 (PMBOK)	25	76%
	3 (PRINCE2)	2	6%
	4 (CPPMBOK)	0	0%
	5 (Other [company's own methodology])	4	12%
		33	**100.0%**
Level of project management training undertaken	1 (None)	0	0%
	2 (PM fundamentals)	3	9%
	3 (PM Intermediate)	2	6%
	4 (Advanced PM training)	19	58%
	5 (Other)	5	15%
	6 (PM fundamentals, Intermediate and advanced training)	4	12%
		33	**100.0%**

Table 5-9: Frequency Distribution for H_{03} Job Experience

5.5.3.1 Analysis and Synthesis for H03 -Acquisition of ICT Skills

Since these respondents were not always ICT project managers, when asked how they became ICT project managers, 24% indicated that they have risen through the ranks or became ICT project managers accidentally. Another 12% indicated formal education. 15% said on-the-job training, 6% self study, 9% said aptitude and ability and another 12% said it was a combination of formal education and on-the-job training. The other 12% of respondents also indicated a combination of some sort. This is an indication that none of the respondents, who took part in the survey, were ICT project managers from the onset.

The survey shows that 76% of respondents who took part in the survey adopted PMBOK for implementation of ICT projects. This could explain why most respondents undertook PMP certification. 6% of respondents adopted PRINCE2 methodology while the other 12% adopted company methodology. The last 6% said that they had not adopted any methodology for their ICT projects.

The results of the survey show that 58% of respondents undertook advanced project management training, 9% undertook project management fundamentals while 6% did project management intermediate training. 15% of respondents indicated that they undertook project management as a module in their degree or postgraduate qualification. In general the survey shows advanced project management training as the preferred level of project management training.

Project management is on the rise, covering virtually all business sectors and becoming one of the most sought-after professional competencies by employers worldwide. Organisations need people who have clear direction, are efficient, can easily adapt to change, are effective communicators and are committed to quality deliverables. Finding individuals with this broad range of expertise is challenging, which is why project management skills are highly desired and valued in today's workforce.

While work experience helps build these qualities and encourages professional growth, there is another option for individuals who recognise the value of project management. Individuals can differentiate themselves from their team members not only through serving on a variety of project teams, but also by gaining professional credentials. Obtaining a professional credential helps provide a distinct advantage in accessing new opportunities and increases visibility in team-oriented environments. As the demand for skilled project team members continues to increase, the benefits of credentials are increasingly evident, thus it is crucial for the ICT project manager to get the necessary project qualifications to be able to be competitive.

5.5.4 Hypothesis Testing for H_{03}

When testing for the hypothesis that to be an ICT project manager, the background (qualification and experience) is not important, it was found that H_{03} null hypothesis was rejected at alpha 0.05, (p-value < 0.05) and thus the alternative hypothesis is accepted as real that to be an ICT project manager, the background (qualification and experience) is important.

To further validate the conclusions made from the hypothesis, a Chi-square test was undertaken to show the relationship between ICT job experience and the competency rate of project managers in delivering projects on time, within budget and of acceptable quality. *A trend was that project managers with the highest job experience were experts in terms of delivering projects on time and within acceptable cost.*

Another Chi-square test was undertaken to cross tabulate between qualification and competency rate of project managers in delivering projects on time, within budget and of acceptable quality. A trend observed was that project managers with PM qualifications such as a postgraduate degree in PM or PM certification were experts in terms of delivering projects on time and within acceptable cost.

The main conclusion drawn from a cross tabulation of most of the PM competencies and qualifications and job experience is that qualification and experience are important to be an effective ICT project manager.

5.6 Project Management Increases the Effectiveness of Projects in the ICT Sector (H_{04})

The following question answered H_{04}:

- Effectiveness of project management in the company

Variables	Values	Absolute Frequency	Relative Frequency (%)
Effectiveness of project management in your company	1 (None)	0	0%
	2 (Adds value to the organisation)	7	21%
	3 (Effectiveness of relationship with peers in achieving project goals)	3	9%
	4 (Adds value to the client)	8	24%
	5 (Other)	0	0%
	6 (Adds value to the organisation and adds value to the client)	3	9%
	7 (Adds value to the organisation, adds effectiveness of relationship with peers in achieving project goals and adds value to the client)	11	33%
		33	**100.0%**

Table 5-10: Frequency Distribution for H_{04}

5.6.1 Analysis and Synthesis for H_{04}

The role of the project manager has been cited as one of the required project success factors (Standish Group, 1999, 2001). It is reported that "*97% of successful projects have an experienced project manager at the helm*,"

(Standish Group, 2001). To develop skills in a profession, formal education and practice are required (Turner and Huemann, 2000).

The results of this research survey state that none of the respondents indicated that project management does not add value to their organisation. More than 21% of respondents stated that implementing project management added value to their organisations and 24% indicated that it adds value to the client. 9% are of the opinion that it helps with the effectiveness of relationships with peers in achieving the project goal. 42% said it is a combination of all the factors as per Table 5-6. Based on the results obtained and the frequency distribution, an assumption can thus be made that project management increases the effectiveness of projects in the ICT sector.

The results from this survey support the research by Parker (2002) which states that implementing project management adds significant value to organisations. The results also support (Karpin 1995), who stated that if people who manage and work on projects are competent, they will perform effectively and that this will lead to successful projects and successful organisations.

5.6.2 Hypothesis Testing for H_{04}

The final tested hypothesis, namely "Project management does not increase the effectiveness of projects in the ICT sector" was rejected (p-value < 0.05), which means there is no relationship among the variables being tested and thus the alternative hypothesis is accepted as real, that project management indeed increases the effectiveness of projects in the ICT sector.

In validating this hypothesis, Chi-square tests was done which cross tabulated the effectiveness of project management in adding value to the organisation, to the client or effectiveness of relationship with peers in achieving project goals with the competency level of project managers to deliver projects on time and within costs.

The conclusion that was reached is that since project managers are able to deliver projects on time and within budget, this increases the effectiveness of the client, the organisation and the effectiveness of relationships with peers in achieving project goals.

5.7 Summary

This chapter discussed the research findings and provided the analyses and interpretations of data, as well as testing of hypotheses so that the conclusion and recommendations can be made.

Chapter 6

CONCLUSION AND RECOMMENDATIONS

Chapter five discussed the research findings, provided analyses and interpretations of data and hypothesis testing.

This chapter

makes a follow up on the findings, draws conclusions, provides the recommendations and also makes recommendations for further research.

6 CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter concludes the overall research investigation. The conclusion and contributions of the research are presented, after which areas for future research are proposed.

6.2 Conclusions

6.2.1 Project Managers Profile

People who took part in the survey were mostly females, although this was not indicative of the gender proportion of ICT project managers, it was nevertheless a significant observation.

The largest percentage of project managers who took part in the survey was found to be in their thirties. The respondents who were below the age of 30 were mostly junior project managers, while those above 30 were either just project managers or senior project managers.

Most of the requirements when selecting a project manager are that the applicant should have a bachelor degree, working knowledge and should demonstrate the ability to develop high level management programs. These requirements give an indication that project managers are not young graduates, but much rather persons with some measure of maturity.

In selecting a project manager, some executives might consider gray hair to be a sure indication of maturity, but this is not the type of maturity needed for project management. Maturity in project management generally comes from exposure to several types of projects in a variety of fields.

Though more women are now getting involved, project management is still dominated by men. The question is whether this can be ascribed to sexist attitudes of recruiters, or whether there are other reasons for this

phenomenon. Female project managers, who had established themselves in project management in spite of their gender, expressed real feelings of intimidation as part of their early experiences when they stepped into this predominantly male discipline. Networking opportunities such as golf and the 'old boy's club' were missed by women. Also, for women to prove their credibility and worth was a constant issue. Yet, considering the common perceptions that women are better at the 'soft' skills than men, and that they can multi-task better, are excellent listeners and, are more prepared to share information to benefit the team, would it not therefore be a good idea to encourage more women to get into project management? Currently, opportunities for women as project managers are definitely undersold.

6.2.2 Recognition of Project Management as an Important Profession in the ICT Sector

Project management is recognised as a career path in the ICT sector. Most companies pay for training and the development of project management.

Most companies provide project management support, be it in the form of a project management office, project management centre of excellence, project management directives, policies or support systems.

Since so much is done to support and develop project management training and development, there is certainly a need for project management in most ICT companies.

Historically, project management resided only in the project driven sectors of the marketplace. In those sectors, project managers were given the responsibility for profit and loss, which virtually forced companies to treat project management as a profession. Currently project management is being promoted by marketing, engineering, construction, IT, ICT and production, rather than only project driven departments.

The growth and acceptance of project management has changed significantly over the past forty years and these changes are expected to continue,

especially in the area of multinational project management. By the 1900s, companies began to realize that implementing project management was a necessity, not a choice. The organizations recognized the need for project management.

All companies sooner or later understand the need and basics of project management, but companies who have achieved excellence in project management have done so through successful implementation and execution of processes and methodologies. Thus project management training and development is essential and for organisations to show their support, they need to pay for this development and also put measures in place to enhance their support of project management.

6.2.3 Attributes of ICT Project Manager

Technical skills

Most ICT project managers are competent with regards to the ability to plan, manage, control, execute and monitor projects. Most projects are implemented with due regard for the four baselines of quality, time, scope and budget.

Organic and conceptual skills

Most of the respondents indicated that they have the ability to communicate and have good leadership skills. They are able to motivate others by increasing productivity through teamwork, mobilising support, coaching/mentoring and facilitating workshops. The respondents also indicated that they are assertive, accountable and responsible.

According to respondents they have good interpersonal skills and they are positive, confident, customer centred and able to handle conflict and resolve problems, work well under pressure, are adaptable, innovative, willing to learn and they are lateral thinkers.

Respondents also indicated that their general analytical capabilities, which included problem solving; decision making; root cause analysis and solving

complex problems by using systems thinking are sound and that they are conceptual, logical and methodical.

Business skills

Most project managers are capable in terms of managing across the organisation when they have all the responsibility and little authority.

ICT project managers are also competent with regard to defining and developing a market, understanding the needs and desires of the project's customers and end users.

Most of these ICT project managers have the ability to create an environment for project success. They indicated that they can change to a project-based organisation; that they understand upper management influence and can develop a learning organisation.

In spite of rich experience in ICT project management, a considerable number of them fail at their job. In trying to reduce the number of ICT project failures, the background of the project manager in terms of qualifications and experience will hence be looked into.

A project manager must efficiently and economically deliver a quality project within a fixed time frame. Numerous studies have consistently shown that, for project managers and staff, technical knowledge and skills on the one hand, and people skills on the other hand, are essential to project success (Barad and Raz, 2000).

6.2.4 Background of an ICT Project Manager

Qualifications

Most ICT project managers have been educated to postgraduate degree level. They have a junior degree in some other field of study and then pursue project management as a postgraduate degree, diploma or certificate. Taking up project management certification is the most preferred method of obtaining

project management qualifications since most project managers have qualifications from other professions.

Job experience

The general trend is that most people do not start by being project managers even though they have been working for a while.

Most of the ICT project managers started off in some other profession before they were appointed into a project management position. The other observation was that most ICT project managers have accidentally become project managers, some through on-the-job training and others through aptitude, ability and formal education.

Some ICT project managers were project managers in some other sectors before joining the ICT sector.

As more organisations adopt project management approaches and the demand for project managers grows, there is increasing interest in the competence of project managers and in standards for development and assessment of project management competence. Project management standards are being used extensively throughout the world in training and development, professional certification programmes and corporate project management methodologies on the assumption that there is a positive relationship between standards and effective workplace performance.

Most of the ICT project managers become project managers by rising through the ranks. Project management talent is not always obvious. Most of these 'accidental ICT project managers' are counting on their technical knowledge (in IT, telecommunications, application and software development) to make decisions and not on their ability to influence or motivate people.

Ability and technical expertise in ICT and other related IT areas is not an overriding indicator of an effective ICT project manager. It certainly provides increased credibility on the job in any ICT industry, but has been elevated in

importance beyond what it deserves. ICT project managers need to have leadership potential, which forms an integral part of the knowledge base in any PM programme curriculum.

Appointing accidental project managers is not appropriate because in many instances these inexperienced project managers implement projects that are completed late, are over budget and of poor quality. It is for this reason that most ICT project managers complete project management diplomas, or do certification or project management courses internal or external to their employing organisation, over and above the other qualifications they might have.

6.2.5 The Effectiveness of ICT Project Management

Project management seems to be adding value to the organisation, client and/or also helps with effectiveness of relationships with peers in achieving project goals.

In reality, successful project management offers important benefits to ensure goals are effectively accomplished for the benefit of the organisation, the client and for peers in achieving project goals.

The project manager is responsible for both the completion and the success of the project. Should there be a potential point of failure, for example, the project manager is responsible for identifying and correcting it so that the project remains on track. The project manager provides a designated point of contact for others to go to with questions and concerns, and likewise, the project manager is able to monitor the critical action points (or responsibilities) of other team members.

A key benefit to successfully managing any project is the ability to deliver the finished project within budget. From the time a scope of work is first developed and an estimated budget approved, to the point of completion, costs for the project can inflate quickly when the proper controls are not put in

place. Effective project management provides cost containment which not only saves an organisation money on a single project, but delivering a project within budget also helps ensure money remains available for other projects.

As part of the process, the project manager then tracks each of the deliverables to ensure on-time completion.

When the process of project management is applied to an organisation, it sets up an established system of communication between team members, project managers and clients. The very nature of scoping out a project offers an agreed-upon course of action to obtain the desired result. In essence, that means everyone is on the same page from the start of the project. Additionally, ensuring that a project stays on track requires constant communication with the various team members responsible for each section of the overall project. That measure of forced communication keeps everyone in the loop as the project evolves. And, finally, having a clearly identified project leader, means clients have a direct and known point of contact with whom to communicate.

Through the proper project management process, potential risks or threats to the success of the project are identified early. Understanding the possible areas that can sabotage a project means better decisions are made from the start and, as a result, contribute to an on-time and within-budget completion. Further, should a problem threaten to derail the project in the midst of it, project managers and team members have a clearly defined plan and scope of work in order to make timely decisions to resolve the problem or mitigate the potential risks.

6.3 Recommendations

The research study contributes to the knowledge base of project managers in the South African ICT sector in the following manner.

6.3.1 Recognition of project management as an important profession in the ICT Sector

For organisations to successfully manage their projects, project managers should be considered professionals and have distinct job descriptions. Employees should be allowed to climb one of the two ladders: management ladder or technical ladder (they cannot, however jump back and forth between the two).

6.3.2 Attributes of ICT Project Manager

An aspect that is missing from most project management courses is the development of soft skills. Projects are delivered by people and their attitudes can make a massive difference to the success or otherwise of the project. At worst, people who are resistant or who are pursuing their own agendas can make the project fail, though even just an attitude of indifference can pose a serious risk. On the other hand, when people are managed well within the project management process and structure, they can overcome great difficulty and help deliver a project 'against the odds'.

The soft skills required for a successful project fall into four main areas:

- Individuals
- Small teams
- Team islands
- Project culture

A project manager has to deal with a wide range of people, such as project sponsors, suppliers, experienced professionals and novice administrative support staff. Often, for each of those people, the project manager is just one of a number of competing pressures, with very little actual power or authority.

Therefore, good interpersonal skills are needed to win cooperation and involvement.

6.3.3 Background of ICT Project Manager

Just because an employee is enrolled in courses does not guarantee the proper skills and knowledge that will improve project success are being acquired. Lueders and Kotnour (2001) described a situation that is very common across many organisations, in that "*a project manager may take a hodgepodge of project management classes but these accumulated classes may not provide the project manager with the basis and tools to succeed in the organisation or ensure that this particular training would meet the organization's requirements*." Given that in most instances the organisation is paying for such courses, the organisation has a responsibility to ensure the programmes in which their employees are enrolled are complete, focused and relevant to the skill-building needs of the individual, while aligned with the business strategy and goals of the enterprise.

While the graduate and certificate programmes have merit, they must be supplemented with other educational aspects to have a complete project manager development programme. While certain aspects of the profession might be learned in a classroom setting through simulation and case studies, there are other aspects of the job that require a different type of experience. Particularly hard to train in a classroom are the soft-skill aspects of the job.

Most people become project managers by accident; the usual path to the job is through technical speciality. However, technical success does not lead to project success. While it is necessary, it is not sufficient. According to Graham and Englund (2004), it should be noted that an effective project manager is more than a brilliant engineer or application developer. Technical knowledge is not paramount to being a successful project manager even in a technical organisation. Project manager's selection criteria should include:

- **enthusiasm:** desire to do the job
- **high tolerance for ambiguity**: to work where absolute authority is nonexistent (no clear-cut authority)

- **high coalition and team-building skills:** building coalition of internal and external members
- **client-customer orientation**: balance between internal and external client/customer
- **business orientation**: the need to understand the business of the organisation

6.3.4 Training and Development of ICT Project Managers

Organisations should consider their development approaches for project managers. A large portion of company resources go into projects. Knowing that having skilled project managers can improve project success should be an easy sell for organisations to invest in the development of their project managers. The type of programme and the way courses are delivered depend on the specific organisational size and needs. Organisations can find external training providers who can provide the required project management training that will lead to the successful delivery of projects.

Supplemental courses to expand the programme for internal skill requirements for company methodology should be added. Management must also still consider the importance of on-the-job training. There must be a method for mentoring and coaching newly appointed and trained project managers.

The organisation can support the project manager in developing the required skills to improve the project initiatives of the company by having a programme to develop project management competencies. A project manager development programme will consider both formal training and experience. The organisation must prepare the individual for the job beyond a single faceted training course or academic programme. In offerings from the graduate programmes and the certificate programme courses, organisations can find coursework that would align to their organisational development needs.

The following should be considered as components of a good development plan for ICT project managers:

- Entering a mentor programme
- Attending forums on specific practices and gaining the ability to share best practices
- Becoming part of a network through email connections, company conferences, outside conferences and the web
- Obtaining project management certification

6.3.5 The effectiveness of ICT project management

In ensuring that project management increases the effectiveness of projects in organisations, ICT project managers should ensure:

- completion within allocated time, cost, performance level;
- accepted by user or customer;
- with minimum or mutually agreed scope changes;
- without disturbing the main work flow of the organisation;
- without changing corporate culture;
- providing strategic alignment and
- maintaining a corporate reputation.

Very few projects are completed within the original scope of a project. Scope changes are inevitable and have the potential to destroy not only the morale of a project, but the entire project. Scope changes must be kept to a minimum and those required must be approved by both project manager and the user/customer. The project manager must be willing to manage and make concessions/trade-offs, if necessary, but such that the company's main work is not altered. The project manager must be willing to manage within the guidelines, policies, procedures, rules and directives of the parent organisation.

6.4 Recommendations for Future Research

6.4.1 Project Management Competency Assessment

Research should be undertaken to assess the competency level of project management professionals in the South African ICT sector using a Project Management Competency Development (PMCD) Framework developed by the Project Management Institute (PMI), with the eventual goal of assisting individual project managers with their professional development, as well as creating industry PM reference indexes.

6.4.2 Further research on the knowledge base of PM in the ICT sector

Further exploration of the knowledge base of project managers in the ICT sector should be considered to get additional information on what the general performance levels of ICT projects are.

APPENDIX I: REQUEST TO CONDUCT RESEARCH IN THE RESPONDENT COMPANY

Dear Madam/Sir

I am Keneiloe Moabelo, pursuing the degree Master of Business Leadership (MBL) at Unisa's School of Business Leadership (SBL). I am conducting research about the knowledge base of project managers within the ICT sector from South African perspective. Your company is one of the companies on my sample list. Can you please assist me with my research by providing me with the contact details of two project managers who would be willing to become part of my research?

Your help will be highly appreciated.

Thanks

Keneiloe Moabelo, PMP

GIS Project Manager
Tel: (011) 350 8628
Cell: 082 559 0532
Email: Keneiloe.Moabelo@absa.co.za

APPENDIX II: REQUEST TO COMPLETE A QUESTIONNAIRE

Dear Respondent

Thanks for helping me out, I really appreciate your help. I am conducting research about the knowledge base of project managers in the ICT sector based on a South African perspective. Please assist by providing information by completing the attached questionnaire.

Please note that all communication will be treated in the strictest confidence and participation (or non-participation) and/or participant responses will not be revealed to any external parties.

Participation in the survey will be entirely voluntary; information provided would not be used for any purpose other than stated.

It will take about 15 minutes to complete the questionnaire. I will appreciate if I could have the completed questionnaire by 15 August 2008.
Regards

Keneiloe Moabelo, PMP
GIS Project Manager
Tel: (011) 350 8628
Cell: 082 559 0532
Email: Keneiloe.Moabelo@absa.co.za

APPENDIX III: REMINDER

Dear Respondent

This is just a reminder to please complete the questionnaire and email it back to me by Friday 15 of August 2008.

Thanks

Keneiloe Moabelo, PMP
GIS Project Manager
Tel: (011) 350 862

Cell: 082 559 0532
Email: Keneiloe.Moabelo@absa.co.za

APPENDIX IV: REFERRAL

Dear Respondent

Thank you for completing the questionnaire, your help is highly appreciated. If it is not too much trouble, would you mind assisting me with the contact detail of another project manager in your organisation who could also participate in this study?

Thanks

Keneiloe Moabelo
GIS Project Manager
Tel: (011) 350 862
Fax: (011) 334 5652

Cell: 082 559 0532
Email: Keneiloe.Moabelo@absa.co.za

APPENDIX V: RESEARCH QUESTIONNAIRE

KNOWLEDGE BASE OF PROJECT MANAGERS IN THE SOUTH AFRICAN ICT SECTOR

Dear respondent

I am Keneiloe Moabelo, pursuing the degree MBL at Unisa's SBL. I am conducting research about the knowledge base of project managers in the ICT sector based on the South African perspective. Please assist by providing information based on the following questions. Indicate your choice with a cross [X] in the appropriate box.

SECTION 1: BIOGRAPHICAL DATA

1.1 Please indicate your age group				
< 20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs

1.2 Please indicate your gender	
Male	Female

1.3 Please indicate your project management designation					
Junior project manager	Project manager	Senior project manager	Project coordinator	Programme manager	Other (Please specify)

SECTION 2: QUALIFICATIONS AND JOB EXPERIENCE

2.1 Please indicate your highest educational qualification (use equivalents where necessary)				
Below Grade 12	Grade 12	One-year post-matric qualification	Degree	Postgraduate degree

2.2 Please indicate your highest project management qualification (use equivalents where necessary)				
None	Project Management Diploma	Project Management Degree	Postgraduate degree in Project Management	Other (Please specify)

2.3 Please indicate your project management certification				
None	PMP	CAPM	APMP	Other (Please specify)

2.4 What is your general job experience				
< 1 year	1 – < 2 years	3 – < 5 years	6 – < 10 years	> 10 years

2.5 How long have you been employed as a project manager?				
< 1 year	1 – < 2 years	3 – < 5 years	6 – < 10 years	> 10 years

2.6 How long have you been employed as an ICT project manager?				
< 1 year	1 – < 2 years	3 – < 5 years	6 – < 10 years	> 10 years

2.7 How did acquirer ICT project management skills?					
Risen through the ranks	Accidental PM	Formal Education	On-the-job training	Self Study	Aptitude and Ability

SECTION 3: PROJECT MANAGEMENT TRAINING AND DEVELOPMENT

3.1 In your opinion do you think your company has managerial support for training and development of project manager competencies?			
Yes	No	Uncertain	

3.2 Which project management approach have you adopted for the implementation of your ICT projects?				
None	PMBOK	PRINCE2	CPPMBOK	Other (Please specify)

3.3 Who pays for your project management development?			
Myself	Myself	Myself	

3.4 What type of project management training does your company provide?				
Workshops and Seminars	On-site training	Off-site training	e-learning	Other (Please specify)

3.5 What level of Project management training did you undertake?				
None	PM fundamentals	Intermediate PM training	Advanced PM training	Other (Please specify)

SECTION 4: PROJECT MANAGEMENT COMPETENCE AND ATTRUBUTES

Non-existent	Familiar	Competent	Expert
No experience	Some knowledge and experience	Good knowledge and experience	Deep knowledge and experience
No capability	Basic capability	Good capability	Advanced capability
Does not recognize this knowledge or skill dimension	Not yet effective and efficient	Reasonably effective and efficient	Highly effective and efficient
	Cannot mentor and guide others	Can give basic mentoring and guidance to others	Can effectively mentor and guide others
	Outputs require significant review and quality assurance by others	Outputs may require some light review or quality assurance by others	Outputs require little to no review or quality-assurance by others
	Requires significant mentorship and guidance from others	Does not require mentorship and guidance from others	Is sought out by others for mentorship and guidance

Please use the table above to answer Section 4

4.1 In your opinion what is your knowledge and understanding of Project Management principles, practices, disciplines and best practice methodologies?			
Non-existent	Familiar	Competent	Expert

4.2 Project techniques (PT): In your opinion what is your competency with regard to plan and scope projects (e.g. running Project Definition Workshops; Writing Project Charters; Project Definition Reports); etc.			
Non-existent	Familiar	Competent	Expert
4.3 In your opinion what is your competency with regard to managing project execution (incl. timelines, actions, status reporting, status meetings, deliverables, risks and issues, expenditures, etc.)			
Non-existent	Familiar	Competent	Expert
4.4 Controlling techniques (CT): In your opinion what is your ability to monitor, analyse and report monthly on project status for a business area's project portfolio (Group /Sector / Business unit)			
Non-existent	Familiar	Competent	Expert
4.5 Leadership and Behavioural aspects of PM (BAPM): Rate your ability to lead multi-disciplinary specialists; Organisational skills; Motivate others by increasing productivity through teamwork; Mobilise support; Coach / mentor; Facilitate workshops; Be Assertive, Accountable and Responsible			
Non-existent	Familiar	Competent	Expert
4.6 Communication: Rate your ability for verbal skills; written skills; persuade; establish credibility and integrity with client executive team and project sponsors; presentations skills			
Non-existent	Familiar	Competent	Expert
4.7 What is your competency with regard to following-up with role players regarding minuted actions and due dates?			
Non-existent	Familiar	Competent	Expert
4.8 What is your competency with regards to managing relationships with line- and other role players?			
Non-existent	Familiar	Competent	Expert

4.9 Interpersonal Skills: Positive; confident; customer centric; Able to handle conflict and resolve problems, work well under pressure, adaptable, innovative, willing to learn; thinks laterally (Please provide an overall rating to the abovementioned softer skills)			
Non-existent	Familiar	Competent	Expert
4.10 General analytical ability: Problem solving; Decision Making; Root cause analysis; Solving complex problems by using systems thinking, Conceptual, logical and methodical (Please provide an overall rating to the aforementioned analytical dimensions)			
Non-existent	Familiar	Competent	Expert
4.11 Project Cost Management: Rate your skills at assessing the quantity and cost of resources needed in completing project activities			
Non-existent	Familiar	Competent	Expert
4.12 Project Time Management: Rate your ability to manage projects according to schedules. Do you effectively estimate the effort, resources and time required to complete the project tasks			
Non-existent	Familiar	Competent	Expert
4.13 Marketing and Customer Issues: in your opinion what is your ability in defining and developing a market; understanding the needs and desires of the project‘s customers and end users.			
Non-existent	Familiar	Competent	Expert
4.14 Creating an environment for successful projects: Rate your ability to change to project-based organisations; strategic emphasis for projects and portfolio and programme management; developing a core team process; developing PM in the organisation; organizing for PM; understanding upper management influence; developing a learning organisation, planning for project manager selection; and developing a PM information system.			

Non-existent	Familiar	Competent	Expert
4.15 Organisational issues (OI): Rate your ability to manage across organisations when the PM has all the responsibility and little authority.			
Non-existent	Familiar	Competent	Expert

SECTION 5: RECOGNITION OF BENEFITS OF PROJECT MANAGEMENT

5.1 Does your company recognise Project management as a career position?			
Yes	No	Uncertain	

5.2 Is there a need for project management at your company?			
Yes	No	Uncertain	

5.3. Does your company provide any of the following project management support?				
None	Project Management Office (PMO)	Project management centre of excellence	Project management directives, policies and procedures Or Project support systems	Other (Please specify)

5.4 In your opinion what is the effectiveness of project management in your company?				
None	Adds value to the organisation	Effectiveness of relationship with peers in achieving project goals	adds value to the client	Other (Please specify)

REFERENCES

Argyris, C. & Schon, D.A. (1978). *Organizational Learning: A Theory of Action Perspective.* Addison-Wesley, Reading: MA.

Association For Project Management (APM) GROUP. (2006) *Project Management Body of Knowledge***.** 5th edition. Buckinghamshire: Association for Project Management.

Balsley, H.L. (1970). *Quantitative research methods for business and economics*. New York: Random House.

Barad, M. & Raz, T. (2000). Contribution of quality management tools and practices to project management performance, *International Journal of Quality and Reliability Management*, 17: pp. 571–83.

Bigelow, D. & Baskerville, R. (2005). *IT Projects Fail, What's To Blame*" Retrieved 4 March 2005. Available from http://www.optimizemag.com [Accessed 22 May, 2008].

Bless, C. & Higson-Smith, C. (2000). *Fundamentals of Social Research Methods.* Cape Town: Zebra Publications.

Bogdan, R. & Taylor, S.J. (1975). *Introduction to qualitative research methods*. New York: John Wiley.

Bohn, R.E. (1994). Measuring and managing technological knowledge. *Sloan Management Review, Fall*, pp. 61–73.

Burrows, T. (2003). *ICT is alive and well in SA*. Report. [Online]. Available www: http://www.itweb.co.za/sections/business/2003/0303260700.asp?O=E [Accessed 21 March 2003].

Canada's National Statistics Agency (2006). *Data collection methods*, Retrieved 01 July 2008. Available from

<http://www.statcan.ca/english/edu/power/ch2/methods/methods.htm>

Cassell, C. & Symon, G. (1994). *Qualitative research in work contexts. In C*. (pp. 1-13). Thousand Oaks, CA: Sage Publications.

Crawford, L.H. (1997). *A global approach to project management competence. In: Proceedings of the 1997 AIPM National Conferenc*e, Gold Coast, pp. 220–228.

Creswell, J.W. (1998). *Qualitative Inquiry and Research Design: Choosing Among Five Traditions,* 1st edition. Thousand Oaks, California: Sage Publications.

Diamontopoulos, A. & Schlegelmilch, B. (2006). *Taking the Fear Out of Data Analysis. A step-by step approach.* 6th edition. London: Thomson Learning.

Dwolatzky (2008), "Local ICT Skills vs foreign ICT skills "
Retrieved 22 May 2008. Available from
http://196.30.226.221/events/ictskills/presentation/barry_dwolatzky.pps
[Accessed 22 May, 2008].

e-Europe þ (2003). *A Cooperative Effort to Implement the Information Society in Europe: Action Plan*, European Commission, Lisbon, pp. 1–32.

Frankfort-Nachmias, C. & Nachmias, D. (1992). *Research methods in the social sciences.* 4th edition. New York: St. Martin's Press.

Gareis, R. & Huemann, M. (2000). *Project management competences in the project-oriented organisation*, in Turner, J.R. & Simister, S.J. (eds) Gower Handbook of Project Management, Gower Publishing: Hampshire, pp. 709–21.

Gillham, B. (2000). *Case study research methods.* 1st edition. London: Continuum.

Gorgone, J.T., Davis, G.B., Valacich, J.S., Topi, H., Feinstein, D.L. & Longenecker, H.E. (2002). *IS 2002: Model curriculum and guidelines for undergraduate degree programs in information systems. Association for Computing Machinery curricula recommendations*. [Retrieved: May 23, 2008]. Available from http://www.acm.org/education/is2002.pdf

Graham, R.J. & Englund, R.L. (2004). *Creating an environment for successful projects*. 2nd edition. San Francisco: John Wiley and Sons.

Huemann, M & Stummer, M. (2001). *Too much PM creativity kills your project.* Project Management Creativity, IPMA International Symposium and NORDNET 2001, 31 May – 1 June, 2001 in Stockholm, Sweden.

International Association for Project and Program Management (IAPPM, 2006). *A guide to the project and program management Body of Knowledge,* USA*:* International Association for Project and Program Management.

International Association for Project and Program Management (IAPPM, 2006). *Supplement guide to the CPPMBok,* USA*:* International Association for Project and Program Management.
Available from http://www.iappm.org [Accessed 24 June, 2008]

ILO (2001), "*Life at work in the information economy*", World Employment Report 2001, available at:
www.ilo.org/public/english/support/publ/wer/overview.htm
[Accessed 11 March, 2004]

Jawaharnesan, L. and Price, A.D.F. (1997). Assessment of the role of the client's representative for quality improvement. *Total Quality Management*, 8: pp. 375–89.

Jiang, J.J., Klein, G. and Balloun, J. (1996). Ranking of system implementation success factors. *Project Management Journal*, 27: pp. 49–553

Karpin, D.C. (1995). *Enterprising Nation: Renewing Australia's Managers to Meet the Challenges of the Asia-Pacific Century*. Canberra, Australia: Government Publishing Service (AGPS).

Kealey, D.J.,& Protheroe, D.R. (1996). The effectiveness of cross-cultural training for expatriates: An assessment of the literature on the issue. *International Journal of Intercultural Relations*, 20(2): pp. 141–165.

Keeling, R. (2000). *Project Management and International Perspective.* New York: Palgrave Publication.

Kerzner, H. (2006). *Project Management: A Systems Approach to Planning, Scheduling, and Controllin*g. 9th edition**.** Hoboken, N.J.: John Wiley.

Kerzner, H. (2001). *Strategic Planning for Project Management using A Project, Management Maturity Model***.** New York: John Wiley.

Kirk, J. & Miller, M.L. (1986). *Reliability and validity in qualitative research. Qualitative Research Methods Series*, 1. Beverly Hills, CA: Sage Publications.

Kloppenborg, T. & W. Opfer. (2002). The Current State of Project Management Research: Trends, Interpretation, and Predictions. *Project Management Journal,* 33(2): pp. 5–18.

Korpel, I.R. (2005). *Identifying a leveraging point to improve business performance through eLearning: Case study in a financial institution:* University of Pretoria etd. Retrieved July 23, 2007. Available from: <http://media.wiley.com/product_data/excerpt/28/04713691/0471369128-3.pdf> [Accessed July 23, 2007].

Leedy, P.D. & Ormrod, J.A. (2005). *Practical Research – Planning and Design*. 8th edition. New Jersey: Pearson Prentice Hall.

Liente, B.T & Rea, K.P. (1995). *Project Management for the 21st Century*. United States of America: Academic Press Inc.

Loo, R. (2002). *Working towards best practices in project management: a Canadian study, International Journal of Project Management*, 20: pp. 93–8.

Lueders, K, & Kotnour, T. Integrating a Project Manager's Development with the Delivery of Projects. *Proceedings from the 2001 ASEM National Conference*, (October 11–13, 2001) pp. 37–41.

Mintzberg, Henry, The Manager's Job: Folklore and Fact, *Harvard Business Review*, (March – April 1990), pp. 163–176.

Morgan, G. & Smircich, L. (1980). The case for qualitative research. *Academy of Management Review*, 5: 491–500.

Mutula, S.M & Van Brakel, P. (2007). *ICT skills readiness for the emerging global digital economy among small businesses in developing countries Case study of Botswana*, *Library Hi Tech*, (25)2: pp. 231–245.

Myers, M.D. (1997). Qualitative Research in Information Systems. *MIS Quarterly,***.** 21(2): pp. 241–242.

Parker, P. (2002). *Research: the value of Project Management.* Retrieved 23 May 2008. Available from
< http://www.pmsolutions.com/uploads/pdfs/valueofpm_it.pdf >
[Accessed 23 May, 2008]

Pawłowska, A. (2004). Failures in large systems projects in Poland: Mission Impossible? *Information Polity,* 9: pp. 167–180.

Peters, L.A. & Homer, J. (1996). Learning to lead, to create quality, to influence change in projects. *Project Management Journal*, 27(1): pp. 5–11.

Pinto, J. (2002). Project Management 2002, *Research Technology Management*, 45(2): pp. 22–36.

Project Management Institute (PMI) (2004). *A Guide to the Project Management Body of Knowledge***,** 3rd Edition**,** Newtown Square, Pennsylvania: Project Management Institute.

Project Management Institute (2002). *Project Manager Competency Development (PMCD) Framework*", Newtown Square, Pennsylvania: Project Management Institute.

Project Management Institute (2001). Project *Management Fact Book***.** 2nd Edition, Newtown Square, Pennsylvania: Project Management Institute.

Rwelamila (2007) , *Project management knowledge base in south Africa, have we missed the opportunity*, ceo vol 1 no 1, 2007

SADC E-readiness Task Force (2002), SADC E-Readiness Review and Strategy, SADC, Johannesburg, p. 1060.

Senge, P. (1994). The fifth discipline fieldbook: strategies and tools for building a learning organisation. Doubleday.

Smith M.J. (1988). *Contemporary communication research methods*. Belmont, CA: Wadsworth, Inc.

So¨derlund, J. (2004). *Building theories of project management: past research, questions for the future. International Journal of Project Management,* 22: pp. 183–191.

Stata, R. (1989). `Organizational *learning ± the key to management innovation*. *Sloan Management Review*, 30(3): pp. 63–74.

Steyn, H. (2007). Project management increasingly important*, Finweek*. 25 October pp 79.

SATIS, (2000). *South African ICT Sector Development Framework* Retrieved 23 May 2008. Available from < http://www.thedti.gov.za/saitis/docs/html/chap01.html>

The PMI Project Management Fact Book, 2nd edition.. PMI, 2001.

The Standish Group International. (1994). *The CHAOS Report. The Standish Group*. [Online]. Available: http://www1.standishgroup.com/sample_research/PDFpages/chaos1994.pdf [Accessed: 26/05/2005]

Ting-Toomey, S. (1984). *Qualitative research: An overview*. In Gudykunst, W.W. & Kim, Y.Y. (eds.), Methods for intercultural communication research (pp 169–184). Beverly Hills, CA: Sage Publications.

Toffler, A. (1990). "Powershift: *Knowledge, Wealth, and Violence at the Edge of the 21st Century.* Bantam Books: New York, NY.

Turner, J.R. (2003). *People in project management*. Britain: Gower Publishing.

Turner, J. Rodney, & Mag Martina Huemann. (YEAR). Formal Education in Project Management: Current and Future Trends," *Proceedings of the Project Management Institute Annual Seminars and Symposium* (September 7–16, 2000).

Willke, H. (1998). *Systemisches Wissensmanagement (Systemic knowledge management*). Stuttgart: Lucius and Lucius.

Wourms, B. (2004). *What Makes a Good ICT Project Manager: Five Keys for Success.* Available at http://www.pmsolutions.com Retrieved 1 February, 2004.

ACRONYMS AND ABBREVIATIONS

Acronym	Description
APM	Association for Project Management
APMP	Association for Proposal Management Professionals
BAPM	Behavioural aspects of Project management M
CAPM	Certified Associate in Project Management
CAQ	Certificate of Added Qualification
CPM	Certified Project Manager
IAPPM	International Association of Project and Program Management
ICT	Information and Communication Technology
IS	Information System
IT	Information Technology
IPMA	International Project Management Association
MNE	Multinational Enterprises
PMCD	Project Manager Competency Development
PM	Project Manager
PMBOK	Project Manager Body of Knowledge
PMCOE	Project management centre of excellence
PMI	Project Management Institute
PMO	Project Management Office
SADC	Southern African Development Community
SAITIS	A joint bilateral project between the South African Government, as represented by the Department of Trade and Industry (DTI), Directorate: Electrical Electronic and Allied Industries, and the Canadian International Development Agency (CIDA).
SBL	School of Business Leadership
UNISA	University of South Africa