SOCIAL MEDIA, KNOWLEDGE MANAGEMENT ADOPTION AND INFORMATION AND COMMUNICATION TECHNOLOGY PROJECT SUCCESS IN THE SOUTH AFRICAN CONTEXT

By

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A Dissertation Presented to the Faculty of Commerce, Law and Management, University of the Witwatersrand, Johannesburg, in Fulfilment of the Requirements for the Degree of Master of Commerce

JOHANNESBURG

SOUTH AFRICA

27 AUGUST 2015

ABSTRACT

Many ICT projects continue to fail despite the use of established projects methods and techniques as the proper communication systems required for successful project outcomes have been lacking. It is generally believed that the adoption and diffusion of information and communication technologies (ICTs) makes a contribution to a nation's economic and sustainable development. The explosion of social media is changing the way we communicate and therefore the processes involving project management information systems. Research shows that as technology usage lags, so does per capita income, skills development and productivity. Despite much global literature that relates to the failure of ICT projects, what is absent from the literature is knowledge of the relative contribution of different factors to ICT project success in the South African context. This study sought to address this absence. From a review of the literature on social media tools and knowledge sharing and reuse, four propositions relating the use of social media and adoption of certain knowledge management practices to the success of ICT projects were generated about the likely impact of these variables on ICT project performance. The research study was conducted over twenty-month effort. Both qualitative and quantitative data were obtained. The qualitative study based on a grounded theory analysis of ICT professionals, derived propositions that were tested empirically. Bivariate correlation analysis, multiple linear regressions and multiple hierarchical regression analyses were applied. Results indicated that knowledge management adoption mediates the relationship between social media usage and ICT project cost performance. Additionally project type was found to play a moderating role in the relationship between knowledge management and project performance. Implications for practice and theory are discussed.

CONTENT OVERVIEW

An overview of the content is provided in order to walk the reader through the dissertation.

Chapter 1, titled "*Introduction"*, introduces the reader to the research topic, the background of the study and the rationale for the study. The research problem, objectives, questions and hypotheses are specified. A theoretical model for the study is provided. Relationships between the research topic, the literature review and the research questions and hypotheses are made explicit. A model of the research process is provided. The chapter concludes with an outline of the chapter sequence in the form of a breakdown of the content of the chapters of the dissertation.

Chapter 2 titled *"Literature Review"*, identifies and evaluates the other research findings in the literature that relate to this study. The literature review also indicates where the study fits into the existing body of literature as well as the gap in previous studies. The literature review follows precedent in the field of social media, communication and knowedge managment research .

Chapter 3, titled *" Research Methodology",* examines the steps taken to make sure that the research method chosen adheres to a scientific approach. This chapter outlines a rationale for the research design and method, sampling method, data collection method, the population of the study and the placement of the research within a research paradigm. Validity and reliability measures are addressed. The qualitative and quantitative research designs, ethical considerations and limitation of the study are discussed. Issues relating to data collection and data analysis are reflected. The specific statistical tests applied to test each of the hypotheses are explained, and the use of specific scale items is made explicit and justified in terms of previous research precedent.

Chapter 4, titled '*Qualitative Findings'*, reports the findings that relate to the inductive grounded research process. Propositions derived from this analysis form the basis for the development of quantitative hypotheses.

Chapter 5, titled '*Quantitative Findings*', reports the results of the quantitative testing process. The results of the univariate, bivariate and multivariate testing processes are reported. Tables are provided that report the outcome of the testing of the hypotheses.

Chapter 6, titled '*Discussion of the Findings*', provides a discussion of the results of the study that relates to (i) the relationships between social media usage, and ICT project performance; (ii) the relationships between knowledge management adoption and project performance; and (iii) the interaction effects of KM and project type on different variable combinations.

Chapter 7, titled "*Conclusions and Recommendations",* this chapter provides a summary and discussion of the research findings, the research questions and hypothesis are revisited and answered. Recommendations are made based on the research findings. All research questions are answered in summary, and conclusions are derived. Recommendations for further research conclude this chapter.

DECLARATION

I hereby declare that this dissertation is my own work. It is being submitted in fulfilment of the requirements for the degree of Master of commerce in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree of examination in any other university.

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DANIELLE MEDJO ME ZE

Signed on this the _____ day of _____, 2015

ACKNOWLEDGEMENTS

This dissertation is dedicated to the following people:

- The Lord Jesus Christ- the source of all knowledge and motivation- without whom this wouldn't be possible
- My mom, for her love
- My family for their strong support
- All my respondents who provided a valuable input to this study
- My supervisor, Prof Chris William Callaghan: I am so grateful for his patience, commitment and advises towards me.

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LIST OF ACRONYMS

GTM Grounded theory method

ICT Information and Communication Technology

IT Information technology

IS Information system

JSE Johannesburg Stock Exchange

KM Knowledge management

KMS Knowledge management systems

LO Learning Organisation

ALPHA INDEX TABLE

The brief definitions of certain concepts/theories are provided as follows.

Concepts	**Definitions**
Knowledge management	Process of knowledge creation, validation, distribution and application within a firm. These phases in knowledge management enable an organisation to reflect, learn, unlearn and relearn-which is crucial in building and maintaining core competencies (Bhatt, 2001).
Social media	Online content transmitted via new media; also refer to those network technologies media that support social interaction, social information aggregation and sharing (Zheng, Li, & Zheng, 2010).
Project communication	Flow of information between all the project stakeholders. The communication is not only made in a single direction but also include feedback from the receiver (Steyn, Du Plessis, Kruger &Sparrius, 2012).
Information and Communication technologies	Information and communication technologies are toolsthat help people to communicate through electronic means by capturing, processing, storing, and communicating information. They consist of software and hardware, cellular phones, television, radio, network appliances, satellite systems, and others similar applications (Mckay, Marshall& Siddharta, 2013).
Mixed methods	A mixed methodology approach refers to the collection or analysis of both quantitative and qualitative data in a single study (Gray, 2009, p.204).

CHAPTER 1

INTRODUCTION

1. INTRODUCTION

In this contemporary highly competitive environment, organisations are under pressure to innovate in a short period of time (Amara, Landry & Doloreux, 2009). In this instance projects are increasingly used to develop and implement new products, services and systems solutions (Pinkowska & Lent, 2011). One of the sectors playing a crucial role in many African economies is the information and communications technology (ICT) sector (Muganda & Pillay, 2013). The ICT sector is not only a major industry in its own right, but also a backbone for many others. The cellphone industry played a critical role as an enabler to develop and enhance the South African services sector. Muganda & Pillay (2013) added that wireless application services and mobile money are growing rapidly in SA. Lack of infrastructure and crime, has led to many innovations in SA. In other words, government sluggishness drove the private sector to become more creative. For example, seeing that customers were concerned about digital banking-related crimes, the South African banks reacted to these crimes swiftly and with lots of sophistication (Dagada, 2012). Despite the efforts of major institutions like PMI-PMBOK, SEI-CMMI, IEEE Standards, CCTA-Prince, ITIL-Standards, and ISO-Standards to provide them with a body of substantial knowledge and methodologies, ICT projects failure remain a big issue not only in Africa but also worldwide (Gelbart & Carmelli, 2009).

1.1 Background to the study

Few studies on project management focused on ICT in Africa. Past studies have focused on success factor for project management or project manager's skills (Kyobe, 2011). There has been little focus on how communication and knowledge sharing are conducted within projects, and how they influence ICT project outcome. Communication and collaboration are said to be the anchor for success- these two factors support knowledge sharing and hence, the performance of ICT projects. The main reasons for failure usually involve time issues, costs issues, and achievement of objectives (Smith, Bruyns & Evans, 2011). The importance of effective communication to the success of projects is well documented in the literature. Technology is enabling quicker communication in a more efficient manner. It is suggested that social media tools not only foster communication and availability but they also allow for financial savings within an organisation. These tools provide a means for project managers to meet the demands of the 24-hour workday, which requires the ability to provide real-time information to stakeholders from any location at any time (Schettini & Weiss, 2012). From a

knowledge management perspective, effective through-life project implementation needs a useful through-life knowledge management to support it (Yang, Chen & Wang, 2012). With a specific focus on knowledge management practices adoption and social media tools usage, this dissertation attempts to identify the primary factors that contribute to ICT project success through the application of a qualitative study that is grounded in the South African ICT context. A model is developed, based on this qualitative analysis. A quantitative study is then used to test this model. The differences between the model derived from the qualitative analysis and the one derived from the current ICT literature predict (i) the differences between the global ICT context and the specific South African context, and (ii) the differences over time between the literature and the contemporary ICT context.

This dissertation supports the argument that social media tools can be used in combination with knowledge management practices adoption to provide an interactive benefit that will result in higher rate of project success. Three primary arguments are made in this study. Firstly, research suggests that project team's processes, specifically communication and collaboration, are important to the success of ICT projects (Gelbart & Abraham, 2009). Evidence suggests that social media technologies can be a resourceful communication means to develop trust between project teams' members. Thus, these tools affect the processes involved with information services supporting project management (Remidez & Jones, 2012). On the other hand, Stolovitsky (2010) argues that when misused, social media can badly influence the project trajectory by facilitating the sharing of useless or harmful information. This information can distract project stakeholders or team members from the main project objective- resulting in a complete failure of the project (Stolovitsky, 2010).

The second argument concedes that project communication is important but knowledge management is also crucial to the success of ICT project (Defillippi, Arthur & Lindsay, 2006). Knowledge management is basically about giving information to the right individual at the right point of time.A traditional approach of projects views them as a one time, goal-driven activity aimed at new product or service delivery (Defillipi et al, 2006). This perspective considers a project successful when finished on time and within budget. However, from a knowledge approach, project success relies on knowledge exploitation and exploration. Exploitation is about taking advantage of the existing knowledge; exploration deals with the long term knowledge capability of the firm. Defillipi et al. (2006) agree that knowledge gained from past projects can be reused to contribute to successive projects.

The last argument holds a tension between Information technology usage and its impact on knowledge management adoption. Some researchers believe knowledge management is people centric and therefore are unwilling to use ICT to share or apply knowledge. Others understand that ICT is a strategic tool that can be used more effectively than the informal face to face meeting for knowledge transfer (Murray, Mohamed & Mohamed, 2010). Zheng, Li & Zheng (2010) suggest that modern knowledge management is strongly suported by technology but is never technology-isolated.

Using social media technologies to support project management is an emerging practice, especially within the African context (Remidez & Jones, 2012). The literature confirms that there is a positive relationship between project success and communication practices. Past studies relate the importance of good communication between project managers and sponsors and how this exchange is crucial for effective communication across project team boundaries (Kaplan & Michel, 2010). American companies like VMware and Sprintr have incorporated social media in their project management information system (Remidez & Jones, 2012). It is argued that this study is the first to investigate the extent to which communication practices via social media tools are related to ICT project success in the South African context.

The findings of this study are expected to deepen the knowledge on the interaction effect/moderator role of social media technologies in the relationship between knowledge management and project success in the South African ICT sector. Furthermore there is a need to contribute to the sharing of knowledge on experience related to ICT project success in Africa and South Africa in particular. Finally, it would be beneficial for project managers, practitioners and researchers in other knowledge intensive industries in Africa, to understand how using social media in combination with knowledge management might lead to the successful completion of any project they might be involved.

This dissertation therefore aims to investigate the relationship between the use of social media, the adoption of knowledge management practices and ICT project success in the South African context. The next section presents the research problem, outlines the objectives of the study and draws the derived hypotheses.

1.2 Research problem and research questions

In 2012, a research conducted by McKinsey on more than 5400 IT projects, suggested that large IT projects- defined as those with preliminary price exceeding $15million- run about seven percent over time, forty-five percent over budget and fifty-six percent less value than expected. Additional findings suggested that the longer a project is scheduled, the higher the likelihood that it will run over budget and time (Bloch, Blumberg, & Laartz, 2012). Another survey conducted by IBM on over 1500 practitioners worldwide, indicated that only forty percent of projects met schedule, budget and quality goals. IBM survey findings also suggested that achieving project success does not depend primarily on technology but instead, success depends largely on people (IBM, 2009). While that study was conducted in the UK; subjective evidence suggests a similar dilemma in corporate Africa.

Indeed in Africa, the same is true of numerous ICT projects. Initiatives like Microsoft's digital villages to get rural communities connected in South Africa never came through (Cave, 2013). In Nigeria, Concerns over the number of abandoned IT projects are raising. According to Nigeria Communications week (2013), some industry experts quote Nigeria as a place where most IT projects failed worldwide. An instance would be the failure of the biometric projects on national identity cards apparently caused by a problem of data capturing (Communication, 2013).

The South African telecommunications market also had a set of projects failures. MTN and Vodacom, the giants of the telecommunication industry in the country tried to launch projects such as NOKNOK and Meep respectively, as an attempt to compete with MXIt but they never came to light (Muller, 2011).

The failure rate of ICT projects is still relatively high (Smith, Bruyns & Evans, 2011). These failures, which often cause huge losses in time and money, can prove to be detrimental to a company's growth and development. While the capacity to deliver profitable project on time and within budget has become a challenge, prior studies on ICT projects highlighted that there is a failure to reuse the knowledge from past projects (Tan, Anumba, Carillo, Bouchlaghem & Kamara, 2009). As a result mistakes are repeated, solutions are reformulated and knowledge is lost (Duyshart, Walker, Mohamed & Hampson, 2003). On the other hand, much of a project manager's time is spent on communication. Yet past studies confirmed that the most neglected task of project members is to develop and maintain effective

communication with all stakeholders throughout the lifecycle of the project (Steyn, Du Plessis, Kruger, & Carruthers, 2012).

The research problem is therefore the lack of knowledge on the contribution of social media technologies and knowledge management practices on project success in the South African context. According to Remidez and jones (2012), communications delivered through social media are potentially a valuable resource for developing trust between project team members which is essential in managing relationships. Another priority should be on knowledge sharing and reuse. Peter and Randoph (2009) suggest that knowledge gained from ICT projects is necessary for a project manager to be successful.

The research objective, research questions and the derived hypotheses are now introduced.

2 THE RESEARCH OBJECTIVES, THE RESEARCH QUESTIONSS AND THE DERIVED HYPOTHESES

2.1 The Research Objective

The purpose of this paper is to develop a model relating the use of social media and the adoption of knowledge sharing and application to the success of ICT projects and to test this model quantitatively. Four sub- objectives are now stated:

- To investigate the extent to which social media usage is related to ICT project success.
- To investigate the extent to which knowledge management is associated with ICT project success.
- To analyse the interactional effects between knowledge management practice and the relationship between social media usage and ICT project success.
- Lastly, to analyse the interaction effects between project type and the relationship between knowledge management and ICT project success.

2.2 The Research Questions

The main research question is: what is the relationship between social media usage, knowledge management practices adoption and ICT project success? From this question, four sub- research questions are developed as follows:

1. To what extent is social media tools usage related to ICT project performance?

2. To what extent is social media tools usage related to knowledge management practice?

3. To what extent is the adoption of knowledge management sharing and application related to ICT project performance?

4. What is the overarching relationship between the levels of knowledge management practice and the link social media usage- ICT project performance?

5. What is the overarching relationship between project type and the link knowledge management-ICT project performance?

The hypotheses derived from these sub- research questions are identified as follows:

2.3 The derived Provisional hypotheses

1. H_1: Social media technologies usage is significantly associated with ICT project success.

H_0: There is no significant association between social media technologies usage and ICT project success.

2. H_2: Social media technologies usage is significantly associated with knowledge management adoption.

H_0: There is no significant association between social media technologies usage and knowledge management adoption.

3. H_3: Knowledge management practice is significantly associated with ICT project performance.

H_0: There is no significant association between knowledge management practice and ICT project performance.

4. H_4: The relationship between social media usage and ICT project performance is significantly mediated by knowledge management practice.

H_0: The relationship between social media usage and ICT project performance is NOT significantly mediated by knowledge management practice.

5. H_5: Project type significantly moderates the relationship between knowledge management and project performance.

H_0: Project type does NOT significantly moderates the relationship between knowledge management and project performance.

A brief presentation of the research model and chapter plan now follows.
A diagram of the research model is provided as follows.

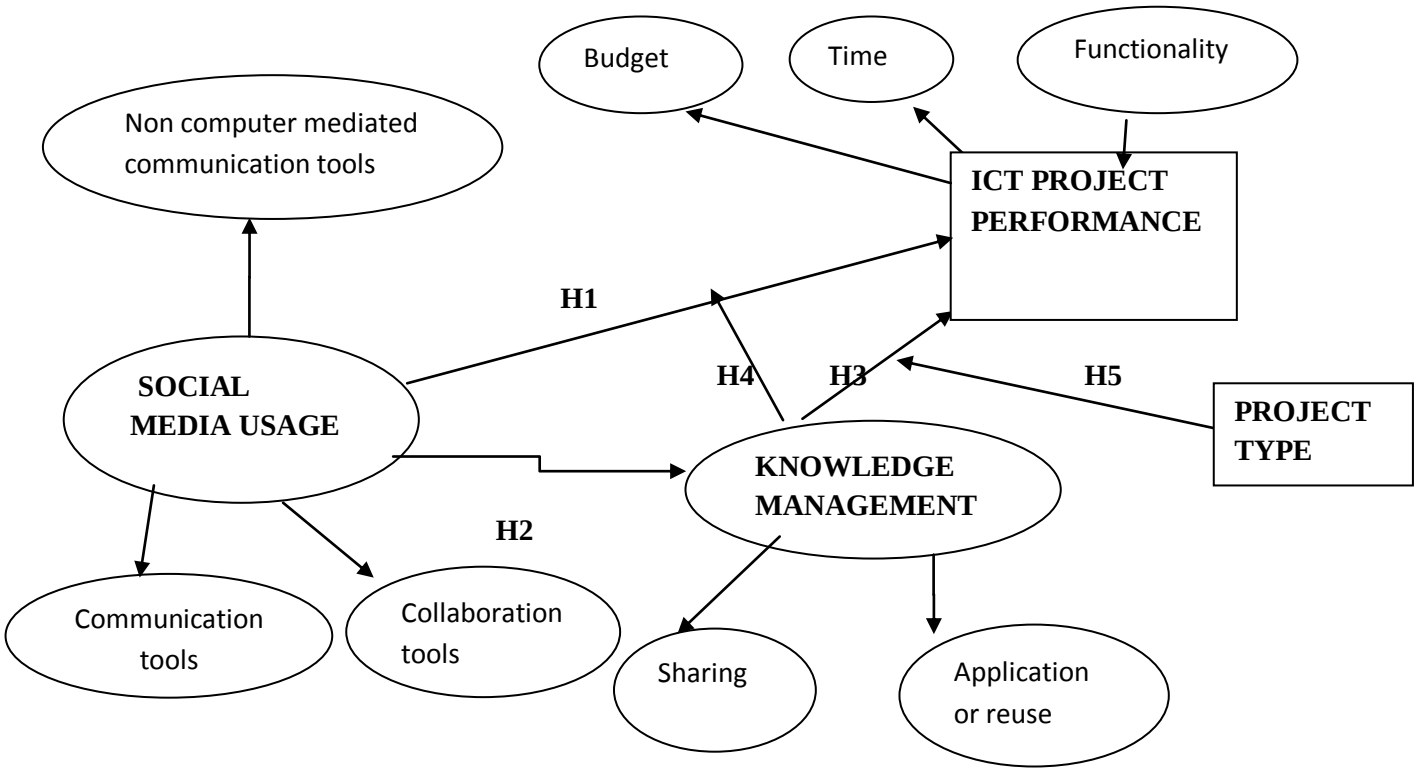


Figure 1: Research model

3 CHAPTER PLAN

Chapter 1: Introduction

This chapter started with a background to the study. The research problem was then stated. Next, the objectives of the study, the main research question and sub-questions were provided. The chapter also presented the provisional research model based on the literature. Five hypotheses were derived from the research questions- related to the relationship between social media usage, knowledge management adoption and ICT project success. Finally the last part outlined a plan of the study.

Chapter 2: Literature Review

This chapter starts with an overview of what social media technologies stand for, as well as the different types and functions. Next, theories linked to communication are outlined. The literature that relates project success and social media tools is reviewed. The concept of knowledge management process is then defined. Past studies that relate the adoption of knowledge management practice, specifically knowledge sharing and reuse to project success are also outlined. The last section of the chapter deals with the ICT industry in South Africa and as a whole. A definition of ICT project is provided and the literature that suggests a link between information technology and knowledge management is reviewed in relation to project success. Finally the criteria under which project success is assessed are explained in the last section of the chapter.

Chapter 3: Research Methodology

In this chapter, the research methodology employed in the study is presented. The next section outlines the qualitative process starting with a detailed explanation of grounded theory, followed by the coding and analysis structures. The quantitative process is then discussed. This latter section reports the research design, the sampling process, the sample size, measures of the variables, the instrumentation and the validity and reliability of the study. The chapter concludes with the ethical principles the researcher should consider and the limitations of the study.

Chapter 4: Grounded Research- Qualitative Findings

In this chapter, the qualitative results of this study are reported. The qualitative analysis intends to formulate propositions which were used as the basis for the tested hypotheses in the quantitative section of the study. Associations around project performance are analysed

using the grounded methodology theory (GMT) and different propositions are resulted for quantitative testing.

Chapter 5: Quantitative Results

In this chapter, the quantitative findings are presented. A report of the findings of the tested hypotheses derived from propositions in the qualtitative analysis is outlined. Univariate results, as well as bivariate and multivariate results are reported in line with each of the tested hypotheses.

Chapter 6: Discussion of the Findings

This chapter discusses both the qualitative and quantitative results of the study. Discussion on how the results are linked to each other and to the formulated hypotheses are also presented in relation to previous studies. Hypotheses on the relationship between social media usage, knowledge management practice and ICT project success are stated and the following qualitative and quantitative results are brought in and discussed. Then follow the restatements of all five hypotheses and a discussion on how the findings are related to the literature.

Chapter 7: Conclusions and Recommendations

This chapter provides a summary of the study in terms of whether the objectives corroborate with the findings. The researcher closes her dissertation with some recommendations for future research.

4 CONCLUSION

This chapter presented the background to the study, the research problem, objectives and research questions. Three arguments were made to illustrate the tension between the theory supporting the use of information technology, specifically social media tools to adopt knowledge sharing and reuse and the relational perspective suggesting that using IT for knowledge management is problematic. The hypotheses derived from the sub-reseach questions were formulated. A model was developed to show the different factors contributing to the success of ICT projects. The final section of the chapter presented the structure of the whole dissertation. A review of past studies and research associated to the usage of social media technologies and knowledge sharing on ICT projects is now introduced.

CHAPTER 2

LITERATURE REVIEW

2 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter discusses the literature relating to social media, knowledge management and project management terms related to the research. It examines previous research studies on project success found to be relevant to the present study. This review begins with a general definition of social media and the theories aligned with communication practices in projects. Next the review discusses knowledge management as it relates to both social media as collaboration and communication tools and project success. The review will then examine the ICT sector in South Africa and suggest a definition of ICT project. The review ends by providing criteria to measure project success performance as investigated by Toyo (2009).

2.2 FRAMEWORK OF SOCIAL MEDIA

‘’ Projects are run by communication” Kerzner.

Communication, relationship development and trust building are being affected by social media. This set of tools has expanded as a crucial mean for organisations to communicate and exchange information internally and externally. Even though social media has a wide range of usability, this section focuses on its application to project management (Remidez & Jones, 2012).

2.2.1 OVERVIEW AND DEFINITION

The way people use and share information and how they communicate, collaborate and organize are being reshaped by new technologies. These technologies brought innovative services and applications, as well as means to communicate and create content (Smith & Elder, 2010).

Social media is transforming consumer behaviors and business communication patterns. The growth of social media platforms such as Facebook and its equivalents have been well documented. For example, a 2009 survey by McKinsey of 1700 executives worldwide showed that about 64% of these companies were using social media for effective internal communications (Culnan et al., 2010). Similarly, in a study of executives, Barnes and Mattson found that 52% reported using social media as effective tools in their businesses. Yet

in spite of this awareness, it appears to be very limited idea on how to define the term social media.

In 1979, Jim Ellis and Tom Truscott from Duke University created the USENET- a global discussion system allowing public messages to be posted by internet users. However, social media time, as we understand today, only started 20 years earlier when Susan and Bruce Abelson created OPEN DIARY- a social networking site connecting online diary writers together. Then the word weblog was used and shortened as blog a year later. The increasing availability of high speed Internet led to the foundation of MYSPACE (2003) and FACEBOOK in 2004. This is turn created the term *social media.*

Social media consists of tools that enable open online exchange of information through conversation and interaction. In contrast to Internet and communication technologies (ICTs), social media run the content of the chat as a piece of information in online setting.

According to (Zheng, Li, & Zheng, 2010), the meaning of the term of social media is two fold. On the one hand, it refers to online content sent out through new media. On the other hand,social media is identified as network technologies based media supporting social interface and social sharing. This second part underlines media with social attributes. This lead to different types or categories of social media as presented in the next section.

2.2.2 TYPES OF SOCIAL MEDIA TOOLS

According to Zheng, Li & Zheng (2010) , social media have different functional, technical and social characteristics, and offer different communication channels. Additionally, they may vary in capability or bandwidth, in modality, time difference (synchronous and asynchronous) and distribution of message as in one to one or one to many.

The following are the categories of social media as identified by Kaplan and Haenlein (2010):

Blogs

Blogs, which represent the first form of social media, are particular types of websites that usually display date-stamped entries in reverse chronological order. They correspond to personal web pages and can come in a large number of different variants. Many companies such as General Motors are already using blogs to update customers, employees and shareholders on developments they consider to be important.

Content communities

The principal objective of content communities is the sharing of media content between users. Content communities exist for a broad range of different media types, including text (like BookCrossing), photos (Flickr), videos (YouTube), and PowerPoint presentations (Slideshare). Users on content communities do not need to create a personal profile page; if they do these pages generally only contain basic information, such as the date they joined the community and the number of videos shared. From a corporate viewpoint, content communities carry the risk of being used as platforms for the sharing of copyright-protected materials.

Other firms, such as Cisco and Google, rely on content communities to share recruiting videos, as well as keynote speeches and press announcements, with their employees and investors.

Social networking sites

Social networking sites denote applications that allow users to connect by creating personal information profiles, inviting friends and colleagues to have access to those profiles, and sending instant messages between each other. These personal profiles can include any type of information, including video, audio files, photos and blogs. Many companies are already using social networking sites to support the creation of brand communities or for marketing research.

Virtual game worlds

Virtual worlds are platforms that reproduce a three dimensional environment (3D) in which users can appear in the form of personalized avatars and interact with each other as they would in real life. In this sense, virtual worlds are certainly the ultimate social media materialisation, since they offer the highest level of social presence and media richness of all applications discussed thus far. Virtual worlds come in two forms. The first, virtual game worlds require their users to behave according to strict rules in the context of a massively multiplayer online role-playing game (MMORPG). These applications have gained popularity in recent years, as standard game consoles, now allow simultaneous play among a multitude of users around the globe. Japanese automotive Toyota, for example, used pictures and mechanics from the World of Warcraft application in its latest Tundra commercial to reach the 2.5 million players in the U.S. alone.

Virtual social worlds

The second group of virtual worlds often stated as virtual social worlds, allow inhabitants to choose their behavior more freely and basically live a simulated life similar to their real life. Virtual social worlds offer a large number of opportunities for companies in marketing (advertising/communication, virtual product sales/v Commerce, marketing research), and human resource and internal process management.

Table 1 summarises these types.

Table1: Social media types .Source: (Kaplan & Haenlein, 2010)

Categories	**Functions**
Collaborative projects: wikis like Wikipedia and social bookmarking like delicious	Text-based exchange
Content communities- video (YouTube), photo(Flick), power point presentations(Slideshare)	Sharing of media content between users
Social networking sites (Facebook, MySpace, LinkedIn, Twitter)	Enable users to connect
Blogs	Equivalent to personal websites
Virtual game world- Xbox, play station	Platforms in which users appear in the form of avatars and can interact as in the real life
Virtual social worlds (second life)	Users live in the virtual life as in the real life

2.3 COMMUNICATION IN PROJECT SETTINGS

Originally defined by Arnold Tannenbaum, communication refers to *the degree to which information is transmitted among members of a social system*. According to the PMI (2000), project management communication aims to ensure timely and suitable generation, collection, dissemination, storage and disposition of project information (Jewel, 2006).

Communications in a firm are essential to its success. The communication plan is about ensuring that information necessary for the management of projects is collected and

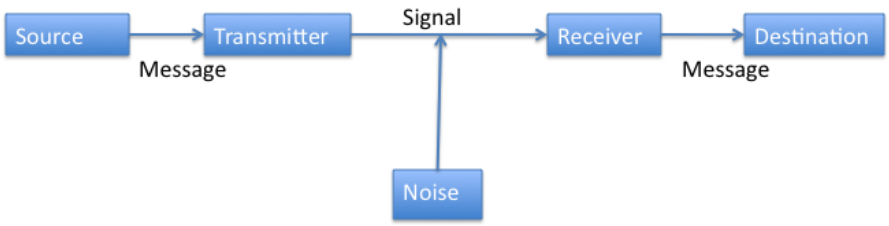
exchanged on time, and stored for traceability when needed. This process specifies what information is collected, when, who is responsible for data collection and analysis and who the recipient of the exchange / distribution plansis (Lockyer & Gordon, 1996).

Effective communication is one crucial motivator in a project. Past studies alleged that about 75% of all problems left after administrative measures are taken, are caused by the lack of communication between team members and stakeholders. Communication consists of project marketing and unwanted information vaguely exchanged within the project team and outside parties. To send a message does not essentially mean that the receiver understood exactly the way we wanted- which is why good communication skills are very important (Pinkowska & Lent, 2011).

Horn et al (2006:91) state that project communication with team members, managers and clients is critical in the project. The team uses a variety of forms of communication: face to face, telephone, emails or written documents. The form they use depends on the people involved and the content. During the course of the project, the team normally reports in writing or electronic form on a periodic basis. At the end of the project, a final report is presented to the client.

The communication with the client usually occurs as a needed basis while the communication with the project manager is more regular, or on a scheduled basis.

Figure 1: Shannon-Weaver Communication Model



The communication process is designed to pass the project's objectives on the relevant stakeholders to provide the right progress feedback on each objective throughout the project's life.

2.3.1 THEORIES OF COMMUNICATION: MEDIA RICHNESS THEORY

This theory refers to *the degree of richness measured by the quantity and quality of four attributes: instant feedback, multiple cues like voice, inflection and body language, communication of a wide variety of concepts and ideas and personal focus of the medium* (Reed & Knight, 2013)**.** Media richness theory highlights the communication mode. The theory states that the media varies according to the degree of richness they have, meaning the amount of information they can distribute in a given time frame (Kaplan & Haenlein, 2010). Reed & Knight (2013) suggest that rich media are used for complex tasks while lean media are used for simpler tasks.

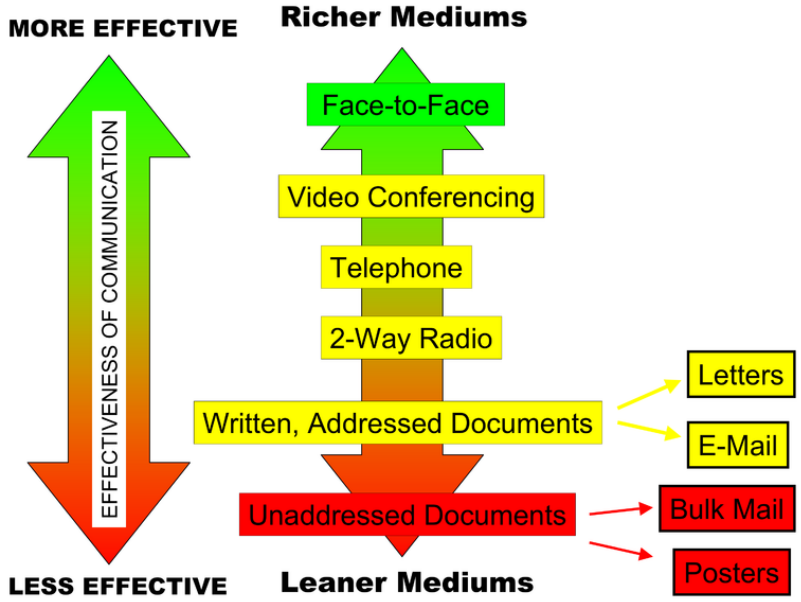


FIGURE 2: MEDIA RICHNESS THEORY

2.3.2 SOCIAL PRESENCE THEORY

While Media Richness theory emphasizes the communication mode, Social presence theory, as developed by Short, Williams & Christie (1976), considers the level of immediacy (asynchronous vs. synchronous) and intimacy (interpersonal vs. mediated) of the

communication medium (Kaplan & Haenlein, 2010). In that sense, a research conducted by Reed & Knight (2013) concluded that text based email had a lower social presence than voice mail sent over the internet. Additionally, aspects that are present in face-to-face communication like eye contact, and other non- verbal cues, direct to a higher social presence.

In summary, Media Richness theory and Social Presence theory describe an effective communication as the one that uses the appropriate medium for the particular type of information being exchanged i.e complex versus simple. On one hand, lean knowledge transfer relating facts and detailed specifications is best communicated using computer mediated channels of communication. On the other hand, communications meant to build trust or social relationship are best relayed by face-to-face as highlighted in the following section.

2.3.3 SOFT VERSUS HARD COMMUNICATION TECHNOLOGIES

The methods used to exchange information between the sender and receiver differs from project to project, situation to situation or person to person.

The soft or human communication technology are non obvious forms of communication that involves facial expression or eye contacts, gestures and body languages (Steyn, Du Plessis, Kruger, & Carruthers, 2012).

However, Steyn et al (2012) underlined that hard or organisational technology consists of informal or formal communication methods with or without the use of hardwares and electronic devices. Previous studies have confirmed that a great deal of information is communicated via softer channels. Thus it is crucial to make a note that project communication is much more than written or verbal flow. A sense of balance is required in terms of organisational structure, people skills and hard technologies in order to effectively support project communication.

Table 2. Choice of communication channel type (Reed & Knight, 2013)**.**

Purpose of communication	Face-to-face	Computer mediated
Build trust	Advantage	
Develop social relationships	Advantage	
Communicate complex material	Advantage	
Communicate detailed factual material		Advantage
Avoid interference by social relationships		Advantage
Make permanent record readily available		Advantage

According to Ellis, Gibbs & Rein (1991), the medium of communication depends on the nature of the teams- co-located teams versus distributed virtual teams as illustrated in the following table.

Table 3: Communication medium according to team types.

	Same time	**Different times**
Same place	Face to face interaction	Asynchronous interaction (telephone conversation)
Different places	Synchronous distributed interaction(live chat communication)	Asynchronous distributed interaction (email)

2.3.4 TRUST

Besides influencing the level of understanding among communicating parties, a communication exchange often results in an assessment of the parties' trustworthiness. It is suggested that communication sent by means of social media technologies are potentially a helpful resource for developing trust between project team members (Remidez & Jones, 2012) . Social media allows small talk, which fosters familiarization and assist in building a supportive, collaborative and trusting environment. A project manager's ability to influence and supervise stakeholder expectation is strongly supported by trust. More research considered trust as an important factor that facilitates cooperation, learning and knowledge sharing. Trust has also been found to help boost satisfaction with practices related to intangible services. In light of this, it can be concluded that managing relationships to build trust is particularly important for projects managers.

2.4 PAST STUDIES OF SOCIAL MEDIA USAGE AND PROJECT SUCCESS

Several past studies such as Remidez and Jones (2012) emphasized the importance of efficient communication to the success of projects.

According to a survey conducted by Elizabeth Harrin, a Project Management Institute (PMI) member, more than two thirds of 181 project managers surveyed in 32 countries believe that social media is a key issue for their industry (Schettini& Weiss, 2011). 36 % of respondents said that they use social media tools to communicate with their project teams, with 24 % reporting that they communicate with the project stakeholders in this way. Nearly half of all respondents (48%) reported using social media tools for document sharing. Among the collaboration tools in use by survey respondents are: SharePoint, NetMeeting, Microsoft Project, Server, and LinkedIn. LinkedIn currently features more than 3,000 groups related to project management, serving more than 3 million people who list project management in their professional profiles.

In his study, Muller (2003) found that good communication between project managers and sponsors was essential for valuable communication across project team boundaries. He also found that task-oriented communications that missed the building aspects of relationships were not enough to carry successful projects.

Strong communication skills have been shown to compliment other aspects of team performance such as supporting team-building efforts by maintaining relationships throughout the project (Remidez & Jones, 2012). These and other relational fundamentals, along with financial and operational outcomes, play a main role in assessing whether a project is considered a success.

Project management requires communication practices that go beyond transaction confirmation to include managing relationships, building trust, and managing stakeholder expectations. It appears that the efficacity of team communication can be improved by project managers through social media technologies usage. Therefore, it is important for project managers to understand the relationships among communication practices, trust development and the affect that social media have on them as they apply to the execution of projects.

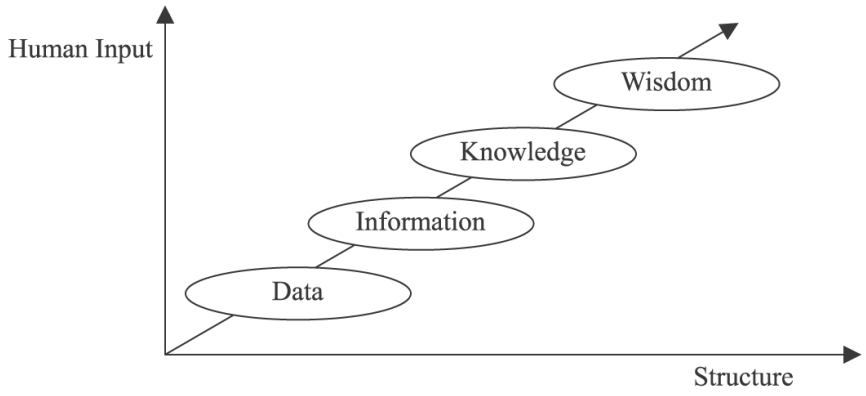
2.5 KNOWLEDGE MANAGEMENT PRACTICE

2.5.1 KNOWLEDGE

In 1959, Peter Drucker referred to knowledge work as 'a growing set of work roles requiring education, qualifications and the ability to acquire and apply theoretical and analytical knowledge (Defillippi, Arthur, & Lindsay, 2006). Today, knowledge plays a key role in the global economy. Business and economic statistics showed evidence of the relative magnitude of knowledge economic value in publicly owned firms. These firms are generally knowledge intensive businesses (Defillipi et al, 2006:4). Thus the knowledge based service industry can be defined as a subdivision of the service sector offering services with skilled human capital as the main input. The growing reliance of the post-modern society on knowledge intensive services including research, product development and new technology, aspired the New economy to be also called the 'learning' Economy. Due to the competitive advantage owned by these knowledge firms, a boost in the creation, transfer and application of intellectual capital has come out (Andersson & Hellerstedt, 2008; Drucker, 1993).

A broad definition of knowledge suggests a '**familiarity, awareness or understanding gained through experience or study'** (Defillipi et al, 2006:10).

Traditional factors of production are becoming secondary with knowledge seen as the most relevant economic resource today. Intangible assets are quickly becoming key indicators of the future performance of a company or country (Nonaka, Dierkes, Antul, & Child, 2001). In brief, intellectual capital is intangible, therefore should not be assessed by classic economists. Hence according to Nonaka et al (2001:794), knowledge considered as intellectual capital would result as an objectified view of knowledge.



Source: Nicholas (2000)

FIGURE 3: STAGES OF KNOWLEDGE

Aristotle (1976), Dewey (1916) and Bourdieu (1977) all viewed knowledge as a social product generated within contexts of experience. More current developments in sociology, biology, and anthropology closely link knowledgenwith 'evolving skills' being produced in the process of people's engagement in the ordinary business of life (Andersson & Hellerstedt, 2008).

Crawford (1991) suggested a schema that looks at the characteristics of knowledge:

Table 4: Characteristic of knowledge in an information-based economy (Neilson, 1997:31).

Knowledge characteristics	**Description**
Expendable and self-generating	Notions of spontaneous knowledge application, development may be facilitated by using lotus notes
Substitutable	Knowledge can replace land, labor and capital as a factor of production
Transportable	Use of IT provides a backbone for information exchange establishing a knowledge base for collaboration.
Shareable	Collaboration and the use of collaboration technologies allows extended knowledge and information sharing beyond face to face communication
Perishable	Sustainable advantage of knowledge and information is short lives. Thus, knowledge must be shared quickly and broadly or it may diminish in value

There are two types of knowledge: tacit and explicit. Tacit knowledge entails the technical and cognitive elements. These technical elements include informal know-how and skills. Cognitive elements encompass mental models like paradigms, perspectives, viewpoints and beliefs. The cognitive elements of tacit knowledge center a person's image of reality and his vision of the future (Nonaka et al, 2001: 494; Nonaka, 1999).

On the other hand, explicit knowledge as described by Nonaka et al (2001) can be expressed in formal language and encrypted in the form of data, specifications, scientific formulae or manuals. It can be processed and stored and is consecutively created by digital activity. While Japanese view knowledge as mainly tacit, Westerner regards it as explicit. In fact, both type are complementary and important to knowledge creation (Nonaka & Takeuchi, 1995).

Table 5: Tacit and explicit knowledge

Tacit knowledge (subjective)	Explicit knowledge (objective)
Knowledge of experience (body) Simultaneous knowledge (here and now) Analog knowledge (practice)	Knowledge of rationality(mind) Sequential knowledge(there and then) Digital knowledge (theory)

Without experiences, one will gain understanding with difficulty and universality can only be achieved if one goes beyond experiences. By analysing experiences, one understands their meaning, which can be used for the next experience. This way, explicit knowledge and tacit knowledge interact with each other in the creative activities of human beings (Nonaka et al,2001:496). The knowledge creation process can mainly be understood through this reciprocal relationship.

Knowledge conversion is the interaction of the two types of knowledge. It is a **social process between people**. According to Nonaka (1995), knowledge is created through the interaction between individuals with different types and contexts of knowledge. As in the figure on knowledge creation process, four modes of knowledge creation are identified:

- Socialisation: from tacit to tacit knowledge through joint activities
- Externalisation: from tacit to explicit knowledge which can occur when a skilled worker tries to put down his technical skills in a manual.
- Combination: from explicit to explicit knowledge. This is done via media such as documents, meetings or telephone interviews.
- Internalisation: from explicit to tacit knowledge; can also refer to learning by doing.

Knowing VS Learning

Knowing and learning are often used interchangeably. Yet, a useful distinction is to be made between the two concepts. Knowing typically refers to the act of putting knowledge to work. In this regard, knowledge is something one possesses while knowing is something that he/she does (Defillipi et al, 2006:10). On the other hand learning is defined as a process through which new knowledge is created or acquired. Learning is experiential via work performance rather than formal study.

2.5.2 THEORY IN KNOWLEDGE MANAGEMENT

Knowledge management (KM) is a term that is increasingly used in academia and professional environments. Different perspectives are presented to define and interpret knowledge management.

The study and practice of knowledge management (KM) have quicklyl grown in most industries. This situation is argued to subsist although the industry is developing into a highly knowledge-based industry (Li & Ma, 2012).

Knowledge management is made of series of approaches used to categorise, represent and share knowledge within an organisation. *It is basically about giving the right information to the right individual at the right period of time.* Studies showed that companies emphasizing on knowledge sharing among all the division of the business were more successful than those who shared smaller amount of knowledge (Sattar, 2012).

Two epistemological approaches on knowledge management are discussed in the literature: the content and the relational.

The Content approach describes knowledge as '*being a predicative truth as it prescribes what to do'***.** Knowledge can be codified and stored in repositories, thus can be reused by others when need be. This perspective views knowledge as an economic asset that can be exchanged between people within an organization (Smith and Lyles, 2006: 56).

In Smith and Lyles (2006) the relational perspective, however, suggests that knowledge should be viewed as mainly *relative and provisional*. The writers of this approach also argue that people should center on the knowing process and the capability to act. Critics of this

approach suggest that knowledge exchange through ICTs is not linked with the use of KM applications within specific contexts.

Table 6: Themes and issues in the relational theory on ICTs and knowledge work (Smith and Lyles, 2006:57).

Key theme	**Issues arising within this theme**
Knowledge/Practice	• Knowledge is socially embedded within practice • A reliance on ICTs to transfer knowledge is problematic
Knowledge sharing within communities	• Knowledge circulates relatively easily due to shared professional background • One view is that integrative application are enough to support knowledge sharing • IT may disturb the ability of newcomers to learn from those with more expertise
Knowledge sharing between communities	• The emergence of new work arrangements • IT may hinder understandings being shared across professional domains • Interactive applications are more suitable than integrative ones • New facilitating roles are required
Norms and cultures	• A strong IT focus is often at the expense of creating an appropriate organization climate • Culture should encourage co-operation, trust, innovation and enterprise • Financial and career incentives may assist or hinder culture
Power and politics	• Expertise is used to support the interest of specific groups • Individualistic motivation for participation • Visibility can lead to positive, negative, or unexpected implications for participation • Knowledge management as a normative slogan

2.5.3 LEARNING ORGANISATION VERSUS KNOWLEDGE MANAGEMENT

Learning organisation and knowledge management have similar understanding on how organizations should effectively learn and manage knowledge (Smith & Lyles, 2006:127).

Smith and Lyles (2006: 497) characterise KM as a combination of texts and practices involved in the creation, acquisition, capture, sharing and storage of knowledge to increase organizational performance. From an historical perspective, Knowledge management and learning organisation are linked to the new world view. They are both seen as characteristics of the epoch called 'the information age' or 'the knowledge society'. KM and LO are also related in management authority and control.

In several journals dealing with KM articles, the link of KM with business performance is highlighted. They also categorize KM as a strategic resource while LO literature analyses means by which knowledge is acquired through learning culture. KM articles also evaluate how knowledge can be captured as a resource to gain competitive advantage. Finally the last thing that often comes out is the use of Information Technology for knowledge processing and storage, using tools such as Intranets or Knowledge Management databases.

Table 7: Main points of the literature on LO and KM (Smith and Lyles, 2006: 504.

Learning organization	Knowledge management
• Theory-driven • Organization unit of analysis(and individual-organization interaction) • 'building' metaphor • Emphasis on culture management and organisation design • Strategic/HR managers responsible for change • Sensitive to context (multitude practice techniques) • Major investment in people and management development • Intangible gains • Emphasis on 'internalization' and 'externalization'	• Practice-driven • Specific project unit of analysis(and individual –project interaction) • 'Mining' metaphor • Emphasis on Information Systems Mnagement and system design • IS/IT managers and Chiefs knowledge officers responsible for change • Independent of context ('best' practice techniques) • Major investment in systems and user training • Tangible performance improvements Emphasis on 'externalization' and 'combination'

On the other hand, the literature related to LO is more academically oriented and the association between LO and IT infrastructure is uncommon (Smith and Lyles, 2006: 501).

The last two points in the above table basically suggest that LO and KM literatures focus on different aspects of the knowledge creation process as described in the previous section. LO emphasises on culture management while KM uses information systems for knowledge externalization.

2.5.4 KNOWLEDGE MANAGEMENT PROCESSES: SHARING AND REUSE

In order to explore how organizations manage, exploit and nourish their knowledge, this research uses a framework for the analysis of organizations as knowledge systems composed of a collection of four knowledge processes: creation and acquisition; storage and retrieval; transfer and sharing; and application. It is important to note that the concepts of knowledge and information tend to be used interchangeably throughout the literature.

-*Knowledge creation and acquisition* is the process of generating knowledge internally and/or acquiring it from external sources. It is worth noting that the effective acquisition of knowledge from external sources depends on the ability of the firm to recognize the value of new external information, assimilate it and apply it to commercial ends. Knowledge creation can be completely accelerated through the use of open source crowdsourced research and development (R&D) (Callaghan; 2014).

-*Knowledge transfer and sharing* refers to the processes of transferring, disseminating and distributing knowledge in order to make it available to those who need it.

-*Knowledge storage and retrieval* refers to the processes of knowledge structuring and storing that makes it more formalized and accessible. Knowledge application can be defined as the process of incorporating knowledge into an organization's products, services and practices (Li & Ma, 2012).

-*Knowledge application* refers to the use of knowledge for decision–making and problem solving by individuals in organization. It is the actual application for taking action that produces organizational value (Smith and Lyles, 2006: 111).

It is worth underlining that knowledge transfer can also be defined as 'a *social process through which one network member is affected by the experience of another'*. Hence the replicated and permanent exchange experiences will result in an excellent potential of valuable knowledge transfer among members of a network (Nieves & Osorio, 2012). The knowledge transfer process refers to the transmission of knowledge from a departure point to where it is needed and applied. The ability to transfer knowledge to the point of application is essential in enhancing the value of the organizational knowledge asset. There are three modes of knowledge transfer in companies:

-Transfer of knowledge between individuals
-Transfer between individuals and knowledge repositories
-Transfer among existing knowledge repositories.

2.5.5 INNOVATION AND KNOWLEDGE PRACTICE

Previous studies noted a clear relationship between innovation and knowledge. According to Nieves & Osorio (2012), innovation is about applying knowledge to create new knowledge. Callaghan (2014) emphasized this view by suggesting that the fundamental nature of knowledge creation is inherently innovative. He added that technologies and systems associated with innovation face natural limits or the flattening out of their S curve (Callaghan, 2015). This entails the role played by knowledge transfer in the innovation process. In this regard, Tsai (2001) highlighted that an opportunity for cooperation and mutual learning can be created through knowledge transfer between members of an organization.

According to Murphya and Salomoneb (2013), knowledge management can be seen as an important means to provide companies with sustainable competitive advantage (Murphya & Salomoneb, 2013; Drucker, 1993).

2.6 ROLE OF IT IN KNOWLEDGE MANAGEMENT PRACTICE

Due to the importance given to communication in knowledge work, the relationship between Information and Communication Technologies (ICTs) and knowledge management initiatives have become very strong (Drucker, 1999). The KM literature emphasizes on the role of IT in knowledge management literature. Developments in the information society lead to an increase in the productivity of humankind as information technologies are used to put the

power of knowledge into action (Callaghan and Papageorgiou, 2014). According to Smith and Lyles (2006:55) there are two types of ICTs identified in KM projects: integrative and interactive applications.

In integrative applications also called structured databases, past projects information are stored and can be retrieved by employees via working papers or contact records. Interactive applications are mainly interactive, using discussion forums or desktop conferences to share experiences.

Despite the contradictory views on ICT use on knowledge management initiatives (content and relational approaches), many firms engage in the creation, capture and use of knowledge with the goal of developing products/services and achieve competitive advantage. Hence the use of information technologies to facilitate this process has become an organizational trend. The following table summarises the different IT tools used for the different knowledge management processes.

Table 8: Information Technologies tools for support of KM processes (Smith and Lyles,2006;115).

	creation	**Storage and retrieval**	**Transfer**	**Application**
Information technologies tools	• E-learning • Collaboration support systems	• Data warehousing and Data mining • Repositories	• Communication support systems • Enterprise information portal	• Expert systems • Decision support systems

2.6.1 COMMUNICATION AND COLLABORATION IN KNOWLEDGE MANAGEMENT

Communication is important for knowledge sharing and is an essential factor that distinguishes successful from unsuccessful projects. The process of connection whereby project team members coordinate activities with one another is communication. This is defined as the process through which information flows (Panahi, Watson, & Partridge, 2012). Computer mediated technologies have been identified in cross-country communication studies as means to support the flow of information and knowledge within businesses.

The existence of tacit and explicit knowledge impacts hugely on how organisations facilitate knowledge transfer. Therefore many companies attempt to benefit from knowledge sharing through collaboration between people. A very emerging means to do so is social media

applications that offer a platform to collaborate and exchange information and ideas explicitly and tacitly (Murphya & Salomoneb, 2013).

As highighed by Callaghan (2014), the key role of a firm is the integration of the specialized knowledge of individuals in order to provide outcomes such as goods and services- the main task of management is to provide the coordination required of this process of knowledge integration.

2.7 PAST STUDIES ON THE RELATIONSHIP BETWEEN KNOWLEDGE MANAGEMENT AND PROJECT SUCCESS

Project-based organizations of knowledge work are becoming very popular where there is a need for new products/services to be developed (Defillippi, Arthur, & Lindsay, 2006).

A traditional approach of projects view them as a one time, goal-driven activity aimed at new product delivery. This perspective considered a project successful when finished on time and within budget. However, from a knowledge approach, project success relies on knowledge exploitation and exploration. Exploitation is about taking advantage of the existing knowledge; exploration deals with the long term knowledge capabilities of the firm. This latter approach view projects as interconnected to each other in an evolutionary cycle. Defillipi et al (2006:129) in their study, agree that knowledge gained from past projects can be reused to contribute to successive projects. In fact they insist that projects are knowledge building opportunities for all the participants involved. It was also suggested that the link between the principles of project management and knowledge management is made possible through project knowledge management which entails the knowledge management in project situations.

Project knowledge can be used via reporting systems or IT Project management knowledge repositories. Furthermore, some tools can be used without information technology, such as brainstorming to think about project possibilities, experts who have worked on similar projects before or project milestone review (Defillipi et al, 2006:145).

However, most projects today use IT tools to codify knowledge- Data mining processes, knowledge management systems or expert locator system only accessible to project sponsors and organizers.

2.8 INTERACTION EFFECT OF KNOWLEDGE MANAGEMENT PRACTICE INTO THE RELATONSHIP BETWEEN SOCIAL MEDIA AND PROJECT SUCCESS

The previous section highlighted the strong link between knowledge management and project success. It was earlier suggested that social media tools are an efficient means for project members to collaborate and hence share knowledge. Previous studies confirmed the association between knowledge management and performance outcomes. Furthermore, Yang et al (2012) underlined the role of knowledge management in developing a strong relationship between IT and organizational performance. Prior research showed a possible mediating role of knowledge management in the relationship between technologies such as social media and performance. Thus this investigation aims to expand past studies on tackling the link between IT, specifically social media technologies, knowledge management and project success (Yang, Chen, & Wang, 2012).

2.9 THE INFORMATION AND COMMUNICATION TECHNOLOGY SECTOR

‘’ In the new economy, all work is project work and you are your projects’’ Tom Peters.

McKay, Marshall & Siddhartha (2013) define ICTS as ‘tools **that aid communication between people through electronic means by capturing, processing, storing, and communicating information’**. They consist of software and hardware, cellular phones, television, radio, network appliances, satellite systems, and others applications and services linked to e-leaning or web conferencing (Mckay, Marshall, & Siddharta, 2013).

Additionally, ICT offers necessary tools for knowledge creation, sharing and diffusion thus enhancing the innovative capacity of all sectors that contribute to economic growth. Moreover, their important role in coordinating global production network help many countries’ economic sectors be globally competitive (Stone, Chavula, & Konde, 2011).

Pade, Mallison & Sewry (2009) suggest that information and knowledge are crucial resources for economic and social activities to operate effectively. Furthermore, ICTs are generally useful means that can be exploited to boost the accessibility, efficiency and quality of the education process in poorer regions of the world via E-learning (Pade, Mallinson, & Sewry, 2009).

The emerging information technology industry is also mainly sustained by the telecommunication sector. Big business opportunities was presented by this booming sector by way of telecommunications global projects, public projects, international projects, international online projects, government telecom projects and project news world wide. Several studies highlighted the role of telecommunications on the performance of an economy. Deloitte (2009) found that a 10% increase in telephone penetration resulted in a 0.6% and 1.2% increase in GDP in developing and emerging markets respectively (Esselaar, Gillwald, Moyo, & Naido, 2010).

2.9.1 THE ICT SECTOR IN SOUTH AFRICA

According to the South African report on Joint Initiative on Priority Skills Acquisition (JIPSA) 2007, the shortage of project management skills impact negatively on project delivery. That report showed that the lack of ICT skills in South Africa was affecting the country's global competitiveness and that shortage was mainly caused by the poor admission rate of science and engineering graduates. Another issue is the gap accentuated by the distorted training programmes offered to project managers (Fourie, 2008).

The South African ICT sector development framework included high telecommunications cost, low ICT skills , shortage of high quality research in innovation and a poor economic model to connect rural communities in the digital society, as the main challenges faced by South Africa in the sector. Additional research revealed that as the adoption of technology is delayed, so is the capita income, productivity and skills development (Kyobe, 2011).

The urge need to embrace the technology world in Africa has been overemphasized in the related literature. As Kobye (2011) stated in his study, with its first World and Third World characteristics, South Africa faces a double challenge of competitiveness in the global market. He also pointed out that although there have been successful ICT initiatives; the usage of ICT is still low in some areas of the economy. Finally, he recommended that the relevance of human, cultural, political, socio-economic and others factors should be considered in the developing countries in regard to their impact on ICT adoption (Kyobe, 2011).

The technology industry is changing at a faster rate than the demand of ICT users; as a result, more projects are likely to be unsuccessful, mainly due to the advanced level of technology. An illustration of this happened in a telecentre in South Africa where the interest in Internet

access by users were mainly focused on basic Microsoft Office programs learning just to find jobs (Pade, Mallinson, & Sewry, 2009).

Another challenge involves the maintenance of hardware, software, spare parts and supplies such as printer and cables, which need to be sustained in order to use those ICT in the long term for the benefit of community members. Finally, it is important to highlight the importance of the appropriate type of software used in the design of applications. This particular software should be adapted to local use and provide opportunities for local programmer to modify the programs to local standards (Pade, Mallinson, & Sewry, 2009).

On the good side, numerous ICT SMME related projects have been introduced in the country. These programmes are grouped into two: i) those that facilitate the entry of SMMEs in the ICT sector and, ii) those that intend to speed up the uptake of ICTs by the general SMME sector. Instance of those of the SMME that support programmes is ISETT-SETA that aims to expand the country into an ICT knowledge society of further building up ICT skills for economic growth.

2.9.2 SUSTAINABILITY

Due to the increasing attention given to global warming phenomenon, an evaluation of the impact of ICTs on environment is important. On one hand, it is believed that ICTs are consuming great amount of energy for operations and cooling purposes. On the other hand, ICTs have the potential to offer larger energy savings through increased efficiency. Effects are positive and negative; direct and indirect. Direct impact refers to the activity related to the ICT products and services themselves while indirect impact deals with the effect on other products not related to ICT.

ICTs can affect diverse aspects of society from economic, social, political, environmental, and legal to technological. Environmental impact involves toxicity, global warming, and ozone layer depletion and water/land use. The economic impact mainly deals with emerging savings due to dynamic on/off network nodes converting into economic savings caused by reduced operational expenses.

These impacts reflect the importance of adopting a sustainable strategy regarding our use of ICTs, in order to fully benefit from the value created by new technologies which are cost savings, energy savings or CO2 emission reduction (Raju, Lindmark, Delaere, & Ballon, 2012).

2.10 PROJECT MANAGEMENT PRINCIPLES

Traditionally the management of projects was considered more of an art than science, but with the growing number of Project management institutions, associations and academic establishments, project management (PM) is becoming more of a science and discipline as practice accepted and formalized in the worldwide body of knowledge. Organizations have been forced to adopt this new science, due to the increasing competition in economy, technology and policy. Thus project management is a tool they use to remain competitive in the market (Othman & Sirbadhood, 2009).

2.10.1 DEFINITION AND IMPORTANCE

Several scholars tried to provide a definition of project according to the situation that suited them. ISO 8402 states: ' **project is a unique process, consisting of a set of coordinated and controlled activities from start to finish dates, undertaken to achieve an objective conforming to specific requirements, including constraints of time, cost and resources'**(Lockyer & Gordon, 1996). Project management is thus mainly linked to the introduction and management of change. According to Lockyer (1996:39), change management involves changes to the configuration of the project product and to the project processes. Effects of all change should be evaluated and authorized before implementation. When change is allowed, the change management should resolve any unpredictable conflicts that arise.

The Project Management Institute (PMI) defines project management as' **the application of knowledge, skills, tools and techniques to project activities to meet project requirements'** (Horn et al, 2006:15). Project management starts with the initiation of the project and includes planning, executing and monitoring project activities. It is also concerned with corrective actions and continues until the closing of the project.

The PMI, a worldwide recognised institution, was established in 1969 and is the first certifying body of project and Program managers. Its website reveals that over 240 000 members in over 160 countries belong to the body. PMI also provides the standards of projects through the main certifying and standards bodies which are accepted as the reference for project management: PMBOK (project management book of knowledge), ANSI

(American national standard institute) and ISO 51 (International standard organization) (Smith D. A., 2010).

Change is something common in all firms. At first, it is regarded as normal and no functional steps are taken. When the changing rate rises in a way that diminishes resources, difficulty arises. At this point, a change to project management is required and a project manager is appointed. Lockyer and Gordon (1996:6) add that many companies try project management on a small scale since the change to project management itself is considered a project. Project management is increasingly becoming an essential discipline of management in many organizations around the world. A study conducted by Hans & Rwelamila (2012) stressed the importance of necessity of learning institutions to align their curricula with companies's needs, and concluded that for the South African case, these programmes fall short of what is really required from project managers.

It is believed that the three pillars of successful project management are: people, process and technology. According to Toyo (2009), project management plays a crucial role in innovation in society today. In the ICT sector, its importance is validated by several studies suggesting that information systems (IS) and IS professionals value project management. Furthermore the strategic role played by IT in many companies has increased the status of project management. Finally, the relevance of project management has been brought to bear by a number of companies that have become project-based (Toyo, 2009).

2.10.2 PROJECT MANAGEMENT PROCEDURES

Several professionals, working as a team are usually involved in projects and the project knowledge is spread across the group. Smith (2010) emphasized that project management is a new approach characterized by techniques dealing with management restructuring, with the aim of controlling a better use of active resources. He also highlighted that project based-companies use projects as a strategic tool for the design of the firm.

Since the PMBOK is widely recognised in the professional and academic worlds, this institution is typically used as an approach to examine project managers' processes strategies. The following are the five processes PMBOK (2004) believed can be applied to a project: initiating, planning, executing, monitoring and controlling, and closing. The institution highlight that these processes are standardized in the PM profession and also suggests that project managers offer ten areas of expertise:

-Project cost management (PCM).
-Project quality management (PQM).
-Project time management (PTM).
-Project integration management (PIM).
-Project scope management (PSM).
-Project human resources management (PHRM).
-Project communication management (PCOM).
-Project procurement management (PPM).
-Project risk management (PRM).
-Project stakeholder management (PSM).

According to Zhang, Zuo & Zillante (2012), the knowledge areas that impact most on project success are risk, scope, time and human resources. Additionally some studies revealed that project managers of successful IT projects possess technical and transformational leadership skills. Toyo (2009) confirmed that transformational leadership is important to project management. A South African report on Joint Initiative on Priority Skills Acquisition (JIPSA) (2007) supports this assertion and states that the lack of project management capability has a negative impact on service delivery (Toyo, 2009).

2.11 WHAT IS AN ICT PROJECT?

An information and communication technology (ICT) project involves the development and installation of a new software product, yet not all projects are development projects. Most projects are 'hybrids' that are constituted of several and independent sub-projects managed separately. Typically, in the management of ICT projects, the project manager's duty is to plan, scope, schedule, estimate, resource and control projects including hybrids, and is expected to do so as a unique set of work tasks. Due to the time constraint they face, project managers can work as meticulously as possible and use all relevant tools to optimize the success of their projects, it is not enough. The table that follows outlines how projects are subdivided in different components:

Table 9. ICT project types and definitions (Dekkers & Forselius, Increasing ICT project success with concrete Scope mangement, 2007).

ICT project type	Description
1. **CUST**- Customer specific new development project	Is a project to create completely new customer specific software
2. **PROD**- Software product new development project	Is a project to create a new software product that may be either standalone packaged software or embedded part of any other product
3. **VERS**- Software version enhancement project	Is a project to create a new version of existing software that may be either customer specific software or a software product
4. **SERV**- ICT service development project	Is a project to create a contract-based continuous or temporary ICT service
5. **PACK**- Package software configuration project	Is a project where the result is an installed, parameterized and, user configured software packag
6. **CONV**- Data conversion project	Is a project where data is moved from persistent data storage of one information system to persistent data storage of another information system
7. **INTG**- Software integration development project	Is a project to create software that provides interfaces services between two or more information systems.

Note that the software development life cycle phases such as requirements specification, software implementation and system test, etc. are not considered to be independent ICT project types, but rather as phases within each sub-project itself (Dekkers & Forselius, 2007).

2.12 FRAMEWORK OF PROJECT SUCCESS

Toyo (2009) suggested that the failure of ICT projects show that there are problems in the way ICT companies manage projects in both Africa and Worldwide.A failed project implies resources and time that have been wasted. Hence a proper definition of project success is required.

2.12.1 A SUGGESTED DEFINITION

For an ICT project to be called a successful project, factors other than the time and cost constraints for a given scope of work should be considered. Those factors include the quality of the product, security, human capital, satisfaction of stakeholders, and adaptability and maintainability (Du Preez, 2007). Some authors believe that evaluating the failure or success of ICT projects depend on individual's opinions on who set the goals and for whom the project outcome is negative. Pade, Mallinson & Sewry (2009) noted that some assess the success of the project from their funders' angle, and other measure that success from the viewpoint of the project participants.

There is no need to stress the high failure rate of ICT projects, thus there is a crucial need to understand the cause of this and put in place a means to lessen such failure rate. In light with the previous sections on ICT application, technology sustainability entails the suitable use of technology in an ICT project for an absolute period of time (Pade, Mallinson, & Sewry, 2009).

Lockyer and Gordon (1996: 39) propose that the operational process is concerned with the project scope, time, cost, resources, communication, personnel, procurement and risk.

2.12.2 THE GOLDEN TRIANGLE: BUDGET TIME AND FUNCTIONALITY

Several previous studies highlight the high rate of IT project failures and how this lead to lost of companies' money, time and employees careers. It was suggested by the Standish group (2004) that about $64 billion is wasted yearly on either failed IT projects or late projects in the USA alone. In order to reduce or eliminate this setback for companies, it was established that budget, time, project scope and client sponsor satisfaction- the latters falling under functionality, are best criteria to be used as measurement indicators of project success (Toyo, 2009).

2.12.3 OTHER FACTORS INFLUENCING PROJECT SUCCESS

Team Size

Several studies confirmed that people are one main factor of failure of ICT projects. These projects reveal an important team based composition. The project teams develop, apply and consolidate ICT structures. Even with the rising research and pratical importance of these projects, very little is known about the constitution of team dynamics. It is therefore vital to investigate the leader's attitudes, personality and behaviors in influenting positive team processes(Gelbart & Carmeli, 2009).

Project environment

Despite obvious data showing improvements in the rate of successful implementation of ICT projects over time, figures of abandoned and failed working projects are still high. It is suggested that technological and organizational complexity, competitive pressure and volatile environment increased the need for best practice project management (broadly defined) in challenging contexts (Mckay, Marshall, & Siddharta, 2013) .

2.13 CONCLUSION

In this chapter, the literature associated with social media and project success was reviewed. The broad context of knowledge was then introduced, and knowledge sharing and reuse effects were discussed. The South African ICT sector was then presented. Project management procedures, ICT project and criteria for success were then discussed in relation to the literature. Having introduced and engaged with the theory and empirical findings that relate to the event being investigated in this research, the next step in the process is to introduce the methodology applied to this study. The methodology applied in this research is outlined and discussed in the chapter that follows.

CHAPTER 3

RESEARCH METHODOLOGY

3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter presented a review of the literature related to social media tools usage and knowledge management practice in organisations. Past studies demonstrated relationships between project success and communication between team members via new technologies, and knowledge transfer and reuse could improve the likelihood of ICT project success.

In this chapter, methods used to measure the variables of the model are discussed. This study's intend is to investigate the influence of social media tools and knowledge management on information and communication technology project success. The use of a mixed method approach in this context aims to strengthen the validity and reliability of the study.

3.2 MIXED METHOD APPROACH: QUALITATIVE AND QUANTITATIVE METHODS

A mixed methodology approach as previously defined, involves the combination of both qualitative and quantitative data collection and analysis. It is generally established that for exploratory research, qualitative methods are more useful, as they can lead the researcher to hypothesis building and explanations. This view suggests that qualitative and quantitative methods are suitable at different stages of research. The first phase requires the use of qualitative methods since the problem is of an unstructured nature. At the second phase, quantitative methods are used to test the hypothesis developed in phase 1 (Ghauri & Gronhaug, 2010). This procedure is the one that was used in this study.

A mixed methodology, through quantitative and qualitative measures, aims to consolidate the research objectivity and reliability and lets the data direct the conclusions. To facilitate the testing of general theories, mixed analysis was used, which began with interviews and wasfollowed by self-administered survey of the chosen population. Smith (2010) believes that mixed method is appropriate when using quantitative sampling methods. He also suggests that, because all data contain both a subjective and an objective component, resultscan be cross validated with the use of a mixed methodology. This method fulfils two supporting purposes: firstly, it helps build a foundation that can be used to construct

argument for knowledge creation and result clarity. Additionally, the mixed methodology approach is accepted as a technique to ensure validity and reliability of the study results, hence cancelling out the weaknesses in both quantitative and qualitative research (Smith D. A., 2010).

3.3 PLACEMENT OF THE RESEARCH: PARADIGMS

Paradigms were initially defined as: universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners (Kuhn, 1970).

Burrell and Morgan use the word as cohesion of perspective, which combines the work of a group of theorists together (Burrell and Morgan, 1979).

Burrell and Morgan define four paradigms: functionalism, interpretivism, radical structuralism and radical humanism. Others, such as Chua (1986), prefer three primary alternatives: positivism, interpretivism(hermeneutics, phenomenology, ethnomethodology, etc.), and critical (Marxism, Critical Social Theory).

The following are the suggested five assumptions of the nature of social science:

-Ontological: is reality out of consciousness or results from individual consciousness?

-Epistemological: how can knowledge be gained and how can the truth be found?

-Human nature: do we create our environments or are we products of our environments?

-Methodological: what inquiry methods are suitable for finding truth‘? Objectivists search for universal laws to explain reality and associations between elements. Subjectivists focus on how individuals create, modify and interpret the world. They see nature as more relativistic.

-Axiological: what is the part of values in research?

Certain assumptions support this research. These relate to epistemology, or assumptions about the grounds of knowledge itself, and ontology, or hypothesis about the nature of the researched event (Burrell & Morgan, 1979).

Ontology: Nominalism vs. Realism

Nominalism believes that society is relative and the social world is names, concepts and labels that make individual structure reality.

Realism assumes that the real world has hard, elusive structures that exist irrespective of our labels. The social world exists separate from the individual‘s perception of it.

This study followed the latter paradigm (realism) as it is more related to the concept of this research.

Epistemology: Positivism vs. Anti Epistemology

Positivism intends to explain and predict what happens in the social world by searching for patterns and relationships. Hypotheses are developed and tested.

Anti-positivism rejects that observing behavior can help people understand it. Social science cannot create true objective knowledge of any kind.

The quantitative section of the research therefore falls into a group of theoretical perspectives linked with positivism and rationalism. Quantitative research is mostly used by positivist researchers and a survey is strongly related to positivism (Callaghan, 2013).

3.4 QUALITATIVE RESEARCH METHODOLOGY

This study used a Grounded Theory methodology (GTM). According to Creswell (2009), grounded theory is a *qualitative strategy of inquiry in which the researcher derives a general, abstract theory of process, action, or interaction grounded in the views of participants in a study*. The grounded theory method is one extensive typology of qualitative research.This research method suggests that theory emerges inductively from the data (Strauss & Corbin, 1990). The grounded theory analysis conducted in this research used thematic content analysis applied according to grounded theory principles.

3.5 GROUNDED THEORY

Strauss and Corbin (1990) believed that grounded theory derived its theoretical underpinnings from pragmatism and symbolic interactionism. Thus, it is essential to note that two main principles drawn from these traditions are built into it. The first principle pertains to change. Since phenomena are not conceived of as static but as continually changing in response to prevailing conditions, an important component is to build change, through process, into the methods (Strauss & Corbin, 1990). The second principle pertains to a clear stand on the issue of determinism. Strict determinism is rejected. Actors are seen as having, though not always, utilizing the means of controlling their destiny by their responses to conditions. They are able to make choices according to perceived options. Grounded theory

seeks not only to uncover relevant conditions but also to determine how the actors under investigation actively respond to those conditions, and to the consequences of their actions.
According to Strauss and Corbin (1990), its main objective is to develop inductive theory from data throughout a logical progression in knowledge, deriving hypotheses, and testing those hypotheses with grounded data and extant theory. This method is the most accurate approach that helps in the understanding of multifaceted information technology project implementation.
The grounded theory allows for a research path guiding the research process toward a theory formulation. The emergent theory is grounded on collected data in the research field and considers the relevant literature. The grounded theory method (GTM) requires a particular approach consisting of the following phases: *noncommittal, integrative, comparative and transcendent*. The first phase, noncommittal or preliminary literature review is crucial in the creation of a substantive theory while remaining open to emergence (Da silva & Walter, 2010). GTM offers critical flexibility to pursue emerging lines of investigation, following a theoretical sampling strategy.
Data was collected from previous studies and interviews and were analysed following the grounded theory method.

3.5.1 TRUSTWORTHINESS

Several researches have established how to respond to the issues of reliability and validity in qualitative studies. Shenton (2004) summarised Guba's constructs that correspond to the criteria used by positivists as follows:
- **Credibility** (in preference to internal validity): how harmonious are the findings with reality? To address this aspect, the researcher examined previous research to struture findings by delimiting the scope of the study to the phenomena at hand.
- **Transferability** (in preference to external validity): this refers to the provision of background data to establish context of study and description of event to allow comparison. Transferability was improved through the sampling process of the qualitative analysis as respondents from different company types were included.
- **Dependability** (in preference to reliability): indepht methodological description to allow study to be repeated.
- **Confirmability** (in preference to objectivity): source triangulation was used to reduce the effect of the researcher bias and support objectivity of the qualitative findings.

3.6 QUALITATIVE PROCESS

A coding process was used and the description of that process is now presented. After this, the qualitative sampling process is discussed.

3.6.1 CODING AND ANALYSIS

According to Strauss and Corbin (1990), coding is a *form of content analysis to find and conceptualise the underlying issues amongst the nooise in the data*. Three coding procedures are outlined as follows: open coding – this process breaks down and categorise data; Axial coding- assembles the data in new ways and selective coding- integrates the different categories. In this last phase, propositions are presented.

Codes were derived from the data at the individual level. The coding list was constantly changed as the analysis progressed. Then these codes were grouped into themes as reported in Table A, B, C and D of the appendix. The scope of this study was enclosed to communication and knowledge management and their association with project performance. Only the most relevant themes to the research questions were included in this research.

3.6.2 THE SAMPLING PROCESS

The sampling for the qualitative research process was based on a modified purposive maximum heterogeneity sampling process. This is a special kind of purposive sample that was used because of the very small size of the sample. The aim was not to generalize findings to all people or groups but to examine information that reveals variation and common patterns within that variation. Respondents were selected across different companies in the South African ICT sector and heterogeneity of the sample was ensured. Therefore, according to precedent offered by qualitative analysis, a sample size of 20 was judged adequate for this study (Patton, 1990).

Random sampling was used for qualitative respondents. Both internal (in house) and external project managers were interviewed following a pre-defined unstructured schedule.

3.7 QUANTITATIVE ANALYSIS

This section presents the design of the study, the survey instrument, the process used, the sampling technique and data collection process. A discussion of the scale measures and

statistical methods used then follows. Limitations of the study and ethical issues conclude this section.

3.7.1 RESEARCH DESIGN

An associative cross-sectional research study was designed. The research being located within the post-positivistic paradigm, the quantitative method was applied; with empirical statistical tests used to test hypotheses (Burrel & Morgan, 1979). The purpose of this quantitative analysis was to test the propositions developed using the qualitative method. Both social media theories and theory on knowledge management focus on the individual level of analysis. The study consisted of two phases: the face-to-face/telephone interviews (see Appendix 8.2), and the online survey (see Appendix 8.7) which illustrated the flow of the research methodology as it was planned. The overall research aimed to complete a cross-case analysis for the mixed methodology approach.

3.7.2 POPULATION AND SAMPLE

The population from which the qualitative methodology respondents were drawn consisted of 20 project participants in the South African ICT sector.

The total population from which the empirical sample was drawn was 140 permanent ICT professionals in Johannesburg. The unavailability of project managers made it challenging to include more respondents.

Sample was drawn from the positions of respondents in the IT departments of companies.The investigation encompassed project managers (28%), system/software engineers (25%), consultants/sales (23%), business/data analysts (11%), program managers (3%) ,IT support officers (6%) and others (4%).

3.7.3 SAMPLING AND SAMPLE SIZE CALCULATION

As outlined by Smith (2010), a small sample size negatively influences findings while a larger sample size supports the reliability of findings. In investigating the effect of social media usage and knowledge management practice on ICT project performance, we want to find out if it will result in a higher likelihood of project success than any other possible factors leading to such event. According to Cohen (1977:474) the formula used to detect such difference is:

$$D= z_{1-\alpha/2}\boldsymbol{\alpha}/\sqrt{\boldsymbol{n}}$$

D is the smallest effect that is worth detecting, α is the significance level which specify the risk we are prepared to take of being wrong when we say that there is a difference when the null hypothesis is true. A sample of 140 out of 200 ICT professionals was drawn from the present study with 70% response rate.

Comprehensive sampling was used for quantitative respondents.This allowed the researcher to reduce sampling error.

3.7.4 CONFIDENCE LEVELS

This study used a 5% significance level with a margin error of 0.5.

3.7.5 INSTRUMENTATION

For the qualitative data, the interview consisted of semi structured questions related to the challenge of using social media technologies to share or reuse knowledge on ICT project. The respondents were asked to recall a recent project they worked on, if and how they used social media in the course of the project and whether this affected the outcome of the project. The respondents provided insight on how knowledge reuse and sharing affected the project outcome.

For the quantitative data, an industry-wide survey instrument was used to measure the degree of social media usage and KM practice on ICT projects and their links with project success. The survey instrument was developed based on the qualitative research and the extant literature. The questionnaire contains 40 items of combined closed ended questions and Likert -based scale.

An introductory letter informs the respondents on the nature of the research and the importance of their participation in the research. The survey includes five sections. Participants were first asked to identify a project they are familiar with for evaluation. For the subject project, the first section of the survey requests the respondent to provide information about the social media tools used during the projects. The second section measures level of knowledge management on the project. The third section of the survey examines the performance of the project. The fourth section assesses what type of project the respondent worked on. The project types were categorized according to seven characteristics: project duration, project size (cost), team size, industry sector, level of complexity of the project,

level of uncertainty of the project environment and the nature of the team relationship. Finally the fifth section relates to biographical information of the participants.

3.8 DATA COLLECTION

With regard to the qualitative component, respondent's opinions were used to gather the overall impressions of the participants on social media usage and knowledge management regarding the project performance. The telephone/ face-to-face interviews were field tested before actual interviews. Data was captured using interviews with tape recordings. A copy of the consent of audio recording and transcription is shown in Appendix 8.5.

For the quantitative data, the survey instrument was administered via SURVEY MONKEY. Each respondent was sent an email link invitation to participate in the online survey: https://www.surveymonkey.com/s/DCB7LD3. This ensured a traceability of the survey-whether they are completed or not yet responded. The survey was used to capture quantitative data related to the extent of usage of social media and knowledge management practices adoption on information and communication technology project and their links with project success. The survey was conducted between August and December 2014. The data collection tool was created to collect project-based data and respondents of the study were identified by a search from companies registered in the South African ICT industry. Project responses were collected from four sources: face to face interviews, telephonic interviews, online surveys and emails. 155 responses were received among which 140 were investigated and 15 were not included in the analysis because they didn't contain enough information.

The survey was piloted before administration to the sample group. The pilot study of the research was done in June 2014 using project participants of companies on the Johannesburg Stock Exchange (JSE) in South Africa. This pilot study aimed to ensure that the questionnaire is valid and reliable (Hair, Wolfinbarger Celsi, Money, & Samouel, 2011).

3.9 MEASURES OF TESTED VARIABLES

For this study, social media tools usage and knowledge management practice were the independent variables.The items used to measure the usage of social media tools are based on Clark (2001) Computer Mediated Communication (CMC) questionnaire. That questionnaire was adapted and used to assess IT professionals' levels of usage and particular communication and collaboration tools they use in the context of project management. A four

–point response scale was used: from 1=heavy use to 4= no use. The knowledge management processes were measured using two constructs: knowledge sharing and knowledge application. The items were based on the instruments proposed by (Gold, Malhotra, & Segars, 2001) and the **KMPI** – knowledge management performance index.

Dependent variable often referred to, as the outcome the researcher is looking for, is the one influenced by manipulation of independent variable. Our dependent variable is ICT project success. ICT project performance assessed the budget, time and functionality of ICT projects. These three dimensions reflect the 'project's golden triangle' and respond to the interests and expectations of key stakeholders such as the management and customers. Items used are based on Gelbart and Abraham (2009) instrument constructed on a five-point scale (ranging from 1 = strongly agree to 5 = strongly disagree).The proposed items of measurement of the factor, labelled functionality performance are: ''this project completely met allspecifications," ''this project produced a high quality product."

A moderator variable is a quantitative or qualitative variable that influences the strength of the relationship between an independent variable and the dependent variable (Baron & Kenny, 1986). For this study, project type was the moderator in the relationship between knowledge management and project performance

3.9.1 RELIABILITY

Reliability can be defined as the stability or the consistency of a measure (Ghauri & Gronhaug, 2010). The internal consistency reliability calculates the extent to which the chosen tests reflect all the same measure. To ensure reliability of the research, the mixed methodology approach will be used in order to provide the same understanding of the questions among all participants and helps attain reliable answers. According to Smith (2010) this methodology approach in effect **''**forces the researcher to replicate the finding in a place where, if valid, it should reoccur''. In assessing the internal consistency of the questionnaire, Cronbach alpha test, developed by Cronbach (1951) were performed in order to determine how consistent answers of respondents are. Cronbach alpha is based on the average correlation of items in measurement scale (Galpin, 2012). The internal consistency describes the degree to which all the items in the test measure the same construct or concept. The procedure entails a summary score calculated where between each of the items forming a

particular scale and the summated score of the scale is used to calculate the strength of the correlation. It is expressed as a number between 0.1 and 1 (Tavakol & Dennick, 2011). The results of the reliability testing of the questionnaire are reported in chapter five.

3.9.2 RESPONSE BIAS AND VALIDITY

Bias results pose severe threat to validity. Researchers are increasingly aware that systematic differences between respondents and non respondents are a bigger cause of concern than low response rates (Mazor, Clauser, Field &Yood, 2002).

For this study, comparing differences between early respondents and late respondents assessed response bias. The latter are those whose responses were collected between November 2014 and February 2015 and the former are those whose responses were collected between august and October 2014. Using a t-test, each variable was tested to determine if there is a significant difference in means at the 5% significance level. Because there was not much difference, response bias was eliminated.

Validity is the extent to which a test measures what we actually wish to measure (Ghauri & Gronhaug, 2010). It tells us whether we can conclude inference from instruments' scores. For the purpose of this study, the content validity was used to measure the extent to which social media usage and KM practices influence project success. This aspect of validity is used to assess the extent to which a measure represents all facets of a given concept (Galpin, 2012).

The content validity of the questionnaire used in this study was tested through the literature review and interviews with projects managers.Thus, to ensure validity, the survey items were based on previous studies and industry interviews. The corrected assessment ie tems were included in the final online survey after piloting.

3.10 DATA ANALYSIS: STATISTICAL TESTING

The first step in any analysis deals with the descriptive analysis of data. The frequency of distribution or histograms, summary statistics such as the standard deviations and means, measures of variability that are standard deviation, the standard error, and the range were all analysed.

Statistical tests are used to analyse some aspect of a sample. Kolmogorov Smirnov D was used to test these parametric statistics. This test is equivalent to a chi-square test for goodness-of-fit, testing to see if the observed data are normally distributed. A p- value less than 0.05 indicate that the data are non-normal (Manly, 2005).

3.10.1 CORRELATION ANALYSIS

A correlation analysis was conducted to assess the net relationship between variables. Since the data were skewed, Kendall's tau correlation coefficient was used to test for the presence of association between social media tools usage, knowledge management adoption and project success.

3.10.2 REGRESSION ANALYSIS

Multiple linear regression analyses were conducted to provide insight into the testing of H_1, H_2 and H_3 (Tabachnik & Fidell, 1996).

H_1 predicted an association between social media usage and ICT project performance.

H_2 predicted an association between social media and knowledge management.

H_3 predicted an association between knowledge management and ICT project performance.

3.10.3 MEDIATION ANALYSIS

Mediation testing was conducted to determine wether H4 should be rejected or accepted.

H_4 the relationship between social media and ICT project performance is mediated by knowledge management.

This hypothesis was assessed by investigating changes in beta coefficients and R-squared when entering knowledge management variable in a series of regression models.

3.10.4 MODERATED REGRESSION ANALYSIS

According to Aiken & West (1991), moderator variable strengthens or reduces the relation between a predictor and an outcome.

H5 project type acts as a moderator between knowledge management and ICT project performance. The moderation tested whether the prediction of ICT project performance from knowledge management changed across different project type. Multiple hierarchical

regression analyses were conducted in this regard (Aiken & West, 1991). Each of the 7 project type variables were tested individually whether they moderate the relationship between knowledge management and ICT project performance.

3.11 ETHICAL CONSIDERATIONS

'*Ethics are moral principles and values that influence the way a researcher or a group of researchers conduct their research activities. Ethics apply to all situations and activities in which, there can be actual or potential harm of any kind to anybody*' (Ghauri & Gronhaug, 2010: 20).

Prior collecting the data, the researcher went through the university's Ethic Committee for study approval. The research followed ethical principles of research.When conducting the interview, the participants were first asked to consent to audio recording and transcription, as shown in appendixes. Only relevant questions to the research questions were asked during interviews and online survey. During the survey collection, participants were requested to sign electronically the release included with the self-administered online survey. This was in line with their anonymity protection.

Finally the study benefits and respondents' anonymity protection were explained in the information sheet of the survey, as indicated in Appendix 8 (Cooper & Schindler, 2001).

3.12 LIMITATIONS OF THE RESEARCH

The use of cross sectional rather than longitudinal survey represents a limitation. The cross-sectional design involves the collection of data at one point in time from a selected sample that represents the population under investigation. Since the study is conducted at one point in time, cross- sectional design limits causal inferences (Pinsonneault & Kraemer, 1993).

The unavailability of project managers and unwillingness to participate presented a restraint on the size of the sample. The sample used a comprehensive sampling which made the results non applicable to the population of Johannesburg as a whole.

It is important to consider the lack of actual measure for the construct project performance.

Respondent's views may have been biased as they were answering some questions in a guessing state which could have flawed the results. However, attemps were made to mitigate the influence of response bias.

The research is also related to endogeneity limitations. In order to be acceptable, a theory should have internal and external consistency and should present a causally valid explanation of a phenomenon (Antonakis, Bendahan, Jacquart, & Lalive, 2012). Due to the exploratory nature of the research, the causes of the event under investigation could not be proved. Nevertheless, in order to infer causality, this research was able to develop theory and to test this theory by using a qualitative process as well as a quantitative process.The quantitative testing was found to support the theory developed from the qualitative analysis.

3.13 CONCLUSION

The methods applied to measure the variables and to collect and analyse the data were discussed. Face to face interview was used for qualitative analysis and online survey was designed for the quantitative approach. Chapter 4 will present the findings of this study.

CHAPTER 4: QUALITATIVE FINDINGS

4 GROUNDED RESEARCH: QUALITATIVE FINDINGS

4.1 INTRODUCTION

This chapter aims to summarise the findings of the grounded analysis of the qualitative data. A primary purpose of the qualitative analysis was also to uncover evidence to support the choice of factors tested quantitatively as to their influence on project performance. The other primary purpose of the qualitative analysis was to explore the relationships between project performance, knowledge management and social media. The reporting of the results in this chapter follows the structure of headings that represent the propositions derived from the analysis. The derivation of the propositions is considered as follows.

4.2 PROPOSITION A: SOCIAL MEDIA

The qualitative data was processed. The coding process was continued until the point of theoretical saturation was reached (Miles & Huberman, 1994). The final codes related to themes fell into three basic categories. Themes associated with social media were coded with SM as a prefix. Themes that related to knowledge management practices were coded with KM as their prefix. Themes associated with project performance were coded PP. The different codes are summarised in tables A, B, C, and D in the appendixes.

The following section presents the analysis showing relationships and themes pertinent to this study. The central theme was that of the usage of both communication and collaborative tools in increasing a positive project outcome.

4.2.1 Communication tools versus collaborative tools

One area of the differences between social media tools that is most relevant in the poject management field is the usage of communicative tools versus collaborative tools.

According to some respondents, social media tools, specifically communication tools play an important role in boosting ICT project performance. The review of literature emphasizes this view with several studies confirming the emerging role of social media tools in project management.

‘’*we used a specific- not specific, it’s a Microsoft link called LYNC that it is installed in our computers. All you have to do is access the network and you can always communicate with it.*

This is what we used mostly especially when travelling to other countries in order to interact with the guys we left behind'' [SMCOM-R1].

Other respondents use these tools just for communication purposes. Communicative tools are believed to be efficient even out of project context as they enable people to keep the contact 24/7. It is sometimes accentuated according to the company type, the team size or the localisation of project team members.

‘’*Lync or skype …to communicate with the team that is off site''*.[SMCOM-R4].

‘’ *I use video conferencing all the time to communicate with the team members offshore. We don't use social media because we got other systems here-there is one called pegant; it works almost like whatsapp but it's not on the phone its on the laptop. We use that one most of the time to communicate when we are in the office and we use watsapp outside office hours when there is a real need'' [SMCOM-R11].*

These tools also bring a sense of innovative impact. The use of communicative tools has been analysed and described as a crucial factor of innovation since these tools are different from classic ones- not only they are faster and spread over long distance but it is aso suggested that very soon its going to spread in rural areas as quickly as it did everywhere else around the world. These tools make the digital village exist.

‘’ *I mean if you think about it, in the next four years, we would probably find that most people in South Africa will have access to the Internet in some sort, whether it is via mobile devices or via desktop. So everybody is going to have access to that space to research or communicate inexpensively…. Even if its not talking on cellphones, we are using our cellphones more and more to communicate, means like Facebook, Whatsapp, Mxi, and short messages. So yes, it is going to have more and more of an impact''* [SMCOM-R6].

‘’ *I believe that the more people communicate, the more we can share knowledge with each other by doing diverse things which brings-spread new ideas. And new ideas create innovation and innovation creates new channels of talking and new ways of living life''*[SMCOM-R12].

Additionally, the usage of these tools is affected by team proximity.

‘’ *Communication can break easily. Say for instancein a big company, the same team are separated by just buildings- just imagine you need to speak to a person to a person or consult with an integrator you need to walk right across to the other building. During that time when*

you walk, the message is not delivered as you thought about it the same way as you were working atyour desk. So if you are at a central place, you can just write everything to that person and someone will get it at the same time and exactly the same format- I think that affects cross-confrontation''[SMCOM-R3].

However there is an indication that these tools are not always in light with contributing to project performance. In fact, they appear to bring along other issues like violation of privacy and less performance in the work environment.

'' *Depending on the context you are going to achieve, the positive side is obviously the success of the project using these tools. On the negative side, it can be some misunderstandings sometime in terms of moving away from face to face interaction''*[SMCOM-R4].

One aspect of social media tools looks at collaborative technologies. Respondent indicated that collaborative tools were essential during the implementation of their projets. The tools allow team member to work together in an effective manner and to share insights with other stakeholders involved.

'' *You can't do project management without tools. Sometimes what happen in projects, you need to inform your executives? They don't want to know the details, they just want to know how you are on track, scope changes, how we mange the issues, things like whats the technology, what did we achieve and so on. As a project manager, you need to give them a dashboard report- so with one view they will be able to see whats going on. The version PMO system was implemented to assist these executives to have a look at things''* [SMCOL-R8].

'' *I don't believe tools like Facebook or Twitter are effective but from a project perspective, any kind of collaborative tools will definitely help in the project''* [SMCOL-R7].

Other highlighted that these tools play a vital role into putting the team together. Previous studies in this regard, suggested that collaborative tools contributed to trust development among the team.

'' *We use Sharepoint, Microsoft project; we got a tool called perpetrator-all our documents are loaded specifically on there, which is visible to the people that we have internally''*[SMCOL-R12].

However differences are found to exist between different tools. Having identified an overarching difference between communication and collaborative tools on how they both influence project outcome, other differences between tools are now discussed. These differences are considered an important aspect of analysis in order to understand the patterns and themes of project performance that are common to the ICT sector.

4.2.2 Differences between traditional tools-beyond non computer communication tools and CMC (Computer Mediated communication tools)

It was suggested that differences between non traditional tools and CMC are related to project time and team location. If the team is colocated, traditional tools happen to be more appropriate and in a smaller company, computer mediated communication tools are not really necessary.

‘’*I don’t need social media to make contact with any of the people that have been involved in a project because we all work in an open space office and the other guy will just be sitting over there- so we don’t really need to use any other tools to communicate… for little problem solving groups that I got together, I could get those wihin ten minutes if I needed to. In a project environment like this implementation issue, you do need to make decisions very quickly’’* [SMNCOMP-R9].

‘’ *Being a small business, we are always under a lot of pressure when it comes to time. I mean we work very very closely on running projects so there is no need for us to use social media tools’’*[SMNCOMP-R6]. The implication here is that if social media tools have to be used in all contexts, then such tools will become ineffective. The implication of such a notion is that the selection of the type of tools-traditional or CMC should be determined according to company size, team proximity, ability of team members to use them and purpose of usage.

On the basis of these conceptions, the following proposition is derived: Proposition, A., that social media tools are used in project management, and the differences that exist in tools are associated with differences in project performance. Proposition A is tested as its corresponding Hypothesis A in the quantitative portion of the research. The grounded analysis that relates to the role of knowledge management adoption in project performance is

considered as follows.

4.3 PROPOSITION B: KNOWLEDGE MANAGEMENT CONCEPTS

At the individual level, a range of different relationships were expected to influence project performance. The first theme that echoes the importance of knowledge management practice is knowledge sharing.

‘’ *We have a knowledge sharing session regularly. We do a basic debrief on what we have done this week, what we have learned and how we can possibly work together to increase the potential that we have within our team so we work on our strenghts and on our weaknesses in a team’’*[KMSH-R12].

The sharing of knowledge was really emphasized when trying to resolve an issue during the project.

‘’*So basically, we got all the tools, skills and knowledge and if there is a problem, the various PMs and program managers that we have- we obviously have to schedule regular meeting to identify any issues and during these meetings we have to come up with a solution’’*[KMSH-R10].

‘’ *If the projects are not similar to what we had before, you just go and find out other people, contracting companies, what they have done- we got a host knowledge base of trying to make sure that we learn. We get vendors outside to do quality checks- we also implement tools internally to do that. So even if you don’t have prior experiece, there are vendors that are assisting you, making sure that what they have given you is the best out there’’*[KMSH-R8].

Knowledge sharing, however, despite being the dominant component of knowledge management practice is only complete when in combination with knowedge reuse. It appears that using knowledge from past projects is considered to have greater influence on project outcome.

‘’ *We got our own WIKI page for different teams so anyone can just go to it and get that knowledge. So I you go there, you can just see every other scenario and experiecnce that another team member has experienced and then you can phone him’’*[KMRE-R3].

‘’ *We used past experiences and creatiivity to overcome any challenges we experienced’’*[KMRE-R7].

‘’ *We got lessons learned. So obviously if you learn , there are certain things that you did in a project you don’t want to redo. In the close out of your projects, all these lessons learned are stored. Then you pull information from all the team members whether they are business, end users, developers, trainers, sponsors or executives. They do the survey and evaluate. You put that in your project and use them again because you don’t want to make the same mistake’’* [KMRE-R8].

On the other hand, sharing knowledge or using knowlegde from past experiences isn’t only for project performance purposes. Some respondent suggested that knowledge management practices can be used as a normal process outside of the project environment.

‘’ *The knowledge that you gain from a project, you are not going to use it for project management only- its going to be used widely in the company. When you are going to companies now, you will find that project management is always a separate entity on its own and its pushed on one side and survival of that always depends on the rest of the team on the management…. It should be a division within the company and run together with any other departments you have within the company’’* [KMRE-R10].

Based on these thoughts, the following proposition is derived: Proposition, B., that knowledge sharing and reuse co exist in project management, and the the level of practice of these KM applications affects project performance. Proposition B is also tested as its corresponding Hypothesis B in the quantitative portion of the research. The grounded analysis that relates to factors influencing project performance at the individual level of analysis is now discussed.

4.4 PROPOSITION C: PERFORMANCE FACTORS: INDIVIDUAL LEVEL OF ANALYSIS

4.4.1 Proposition C1. Experience is related to differences in project performance

Personal experience reflects individual differences and might be related to differences in handling teams, project challenges, and therefore project performance.

‘’ *I mean if you don’t have experience, you are going to have to pick up issues with projects and you are going to get stuck in with the way the project is going. So with the experience*

that you gained over the years will definitely help you with regard to your projects and the problems that you pick up'' [PPEXP-R10].

4.4.2 Proposition C2. International exposure is related to differences in project performance

Differences in project performance might also be a function of different experiences of the international context.

'' *Remember with a global organisation or global company, there is always someone who has done something similar. We got a core team of architects for our region and in different areas as well so if you encounter any problem- technical or technological, you know who to talk to. You send that person an email and if he cant help, he sends an email to the wider community to find out who has had similar experience''*[PPINT-R11].

'' *There was all kind of different ways depending on what the problem was. We would have that kind of problem solving meeting between functional people, data consultant people and consultants. The consultants will go away and investigate. The data consultant has a huge international network and as a consultant they have a massive database of information- so they will go and look at their own resources, they will phone their budddies back in India or California or wherever they happen to be working''*[PPINT-R9].

Communication is also affected by the differences of location of team members.

''*With this project, we had team in the UK, India and China. So just imagine different teams in different countries logging into one system just to communicate. Because of that system, we will have communication break down and we wouldn't know what has happened so this system allow just check into repository and then easier the communication for everyone''* [PPINT-R3].

Finally exposure to such an international context, in terms of knowledge sharing in different countries might facilitate the international collaboration necessary to produce a positive project outcome.

''*Microsoft sharepoint is a centralised collaboration tool. It allows the members to communicate real time across different time zones since our teams are global- as well as to provide infrastructure to project before documentation''*[PPINT-R7].

4.4.3 Proposition C3. Industry sector is related to differences in project performance

Industry sector appeared to make a difference in the type of project and therefore project performance. Exposure to both IT and Telecommunication sectors showed that professionals of the latter experienced bigger team size for a normal project and delivered project faster.

‘’ *So if you take a normal project, you look at all the people from the financial and commercial side; you are looking at about +/-30 people with a cost average of R250 000’’*[PPIS-R10].

‘’ *As anIT consultant operator, i’ve got Te that’s going to run for about 2years. I’ve got a team of very experienced architects it’s about 15 people if i count the two program managers and their projects administrators. At Ni, the other project, I got about 10 people as well as on site and another five offshore’’* [PPIS-R10].

4.5 PROPOSITION D: PERFORMANCE FACTORS: PROJECT LEVEL OF ANALYSIS

4.5.1 Proposition D1. Project Constraints are related to differences in project performance

Some factors have been identified by respondents as constraints that might negatively impact project performance. Several participants mentioned time as a main one.

‘’ *Time is definitely a constraint. Most projects work with time and if you don’t run within time, your project is lost. So if your project is scheduled for for example 3 months and you don’t achieve it by then and its seems to run out of delay, its basically a waste as you will have outstanding projects to carry over the next financial year. What it does, it’s a constraint of the budget again- for the company as a whole to help those funds be allocated again. That will be the major concern’’* [PPCONST-R10].

‘’ *Like I said, those little problem solving groups that I got together, I could get those together within ten minutes if I needed to. In a project environment like this implementation issue, you do need to make decisions very quickly’’* [PPCONST-R9].

Additionaly the more complex a project is in term of requirements, the more time it will take and time allocation should be aligned with the cost and the actual size of the company to be able to run such project.

‘’ *From initial contact to completion, the time depends. If the project is just a small business where we are just looking for the website-almost like we say, its a brochure website where its just one thing to do, you are probably looking at anything from three to six weeks. Obviously if you start to intergrate with business system blog site, getting more business type of application-like e-business, online shopping environment, that can take up to a year’’*[PPCONST-R6].

Knowledge availability also appeared to be another factor reducing the likelihood of project success.

‘’ *Obviously with the fact that they bargain themselves into documentation mechanism, the knowledge will be available at anytime in the future. The only thing that we struggle with is to have it available’’* [PPCONST-R5].

‘’ *Getting access to the information from these repositories does help with the project. If we have the information at hand, we are insuring a more successful project’’* [PPCONST-R4].

Finally, people management or stakeholder’s expectation might hinder the process of getting the project done wthin time or budget.

‘’ *The main factor with project is people involved in projects. You get a chain of people-for example you have your commercial side, your financial side and the actual people running the project from the ground. So in between the communications between the various departments, like for the project I am currently dealing with now, the major concern is the council. You need to get approval from council to start a project. The delay is between six weeks and six months’’* [PPCONST-R10].

4.5.2 Proposition D2. Project Time is related to differences in project performance

As mentioned previously, time is strongly associated with project functionality. The more features a project requires, the more time it will take to complete it.

‘’ *At yit, we did it very quickly, partly because the old system was very old. It didn’t have a lot of functionality in that so we tended to do a fairly vanilla implementation of the Oracle*

software. It took us from when we first started to when we went live- I think it was about eight months. Ria university was a bit different partly because their old system was a lot more sophisticated than the old system here at Yit but the technical platform on which they were built was very old''[PPT-R9].

4.5.3 Proposition D3. Project Team Size is related to differences in project performance

This last proposition suggests a difference in project delivery caused by the project team size. This factor is strongly linked to time and cost- two main component of project performance. The bigger the project, the more people it might require and the more time it might take.

'' *The project we recently completed was ULP upgrade. ULP is basically upgrading the ATMs, you know in terms of functionality and everything- and making sure that the guys in other countries can interact or have connection easily rather than always go to specific ATMs. So the project started last year in June and we completed it this year. It was strictly one year to complete this project. Rougly we were about eighteen of us''* [PPTS-R1].

'' *We have worked on the ''explorer decoder project'' from 2010 to 2013. This project was huge, i think we had 150 people working on it''* [PPTS-R3].

4.6 CONCLUSION

This section summarises the overarching relationships around project performance that emerged from respondent's grounded responses. These relationships are considered as causal structures that are linked to a project context in each case. Propositions formulated are the basesof the developed hypotheses that were tested quantitatively. The following chapter presents these quantitative findings.

CHAPTER 5

QUANTITATIVE FINDINGS

5 QUANTITATIVE RESULTS

5.1 INTRODUCTION

In this chapter, the findings of the statistical testing are presented. The work of the preceding chapters is further expanded in this chapter into the reporting of the results of the empirical testing of the hypotheses. The previous chapter summarised the qualitative results which were used to derive propositions for testing quantitatively. The results of the testing of hypotheses that relate to social media usage (Hypothesis A) and knowledge management adoption (Hypothesis B) are presented in this chapter. Therefore this chapter reports the results of tests against the hypotheses and the next chapter presents a discussion of these results. The reporting of the results of the univariate analysis is undertaken as follows.

5.2 UNIVARIATE ANALYSIS

5.2.1The sample

A total of 140 responses were analysed. The average age of the respondents was 30.6 years with the youngest being 20 years old and the oldest being 62 years old. The average respondent had 4.4 years' experience in project management with the respondents with the highest level of experience having been in project management for 23 years. Each respondend had been involved in on average 10 projects. The results are also shown in the table below.

Table 10. Summary descriptive statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	140	20	62	30.614	9.015
Years of experience do you have in project management	140	0	23	4.421	4.855
Number of IT/ICT projects have you been involved in	140	0	100	9.929	12.866

Majority of the respondents were male (69%) and 31 % female.

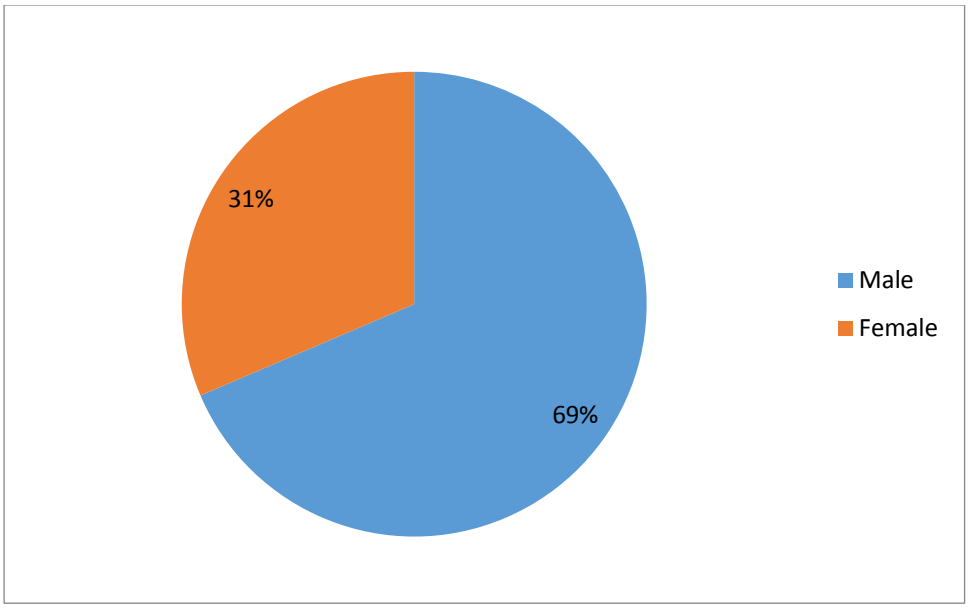


Figure 4: Gender

More than a quarter of the respondents (25%) were project managers -that is both junior and senior project manager, 25% were system or software developers. The rest of the job titles are shown in the diagram below.

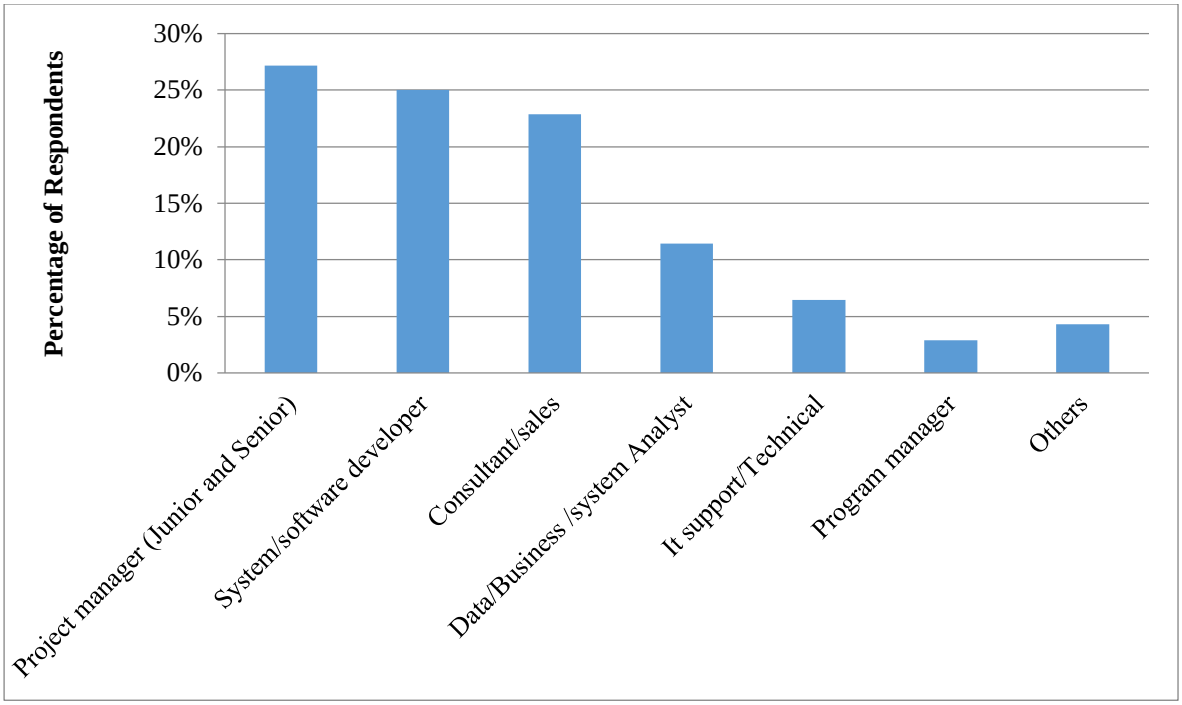


Figure 5: Job Title

Only a few respondents (17%) had lower than a Bachelor's degree as their highest level of education. Additionaly only 1% of respondent had a PHD degree- the highest level.

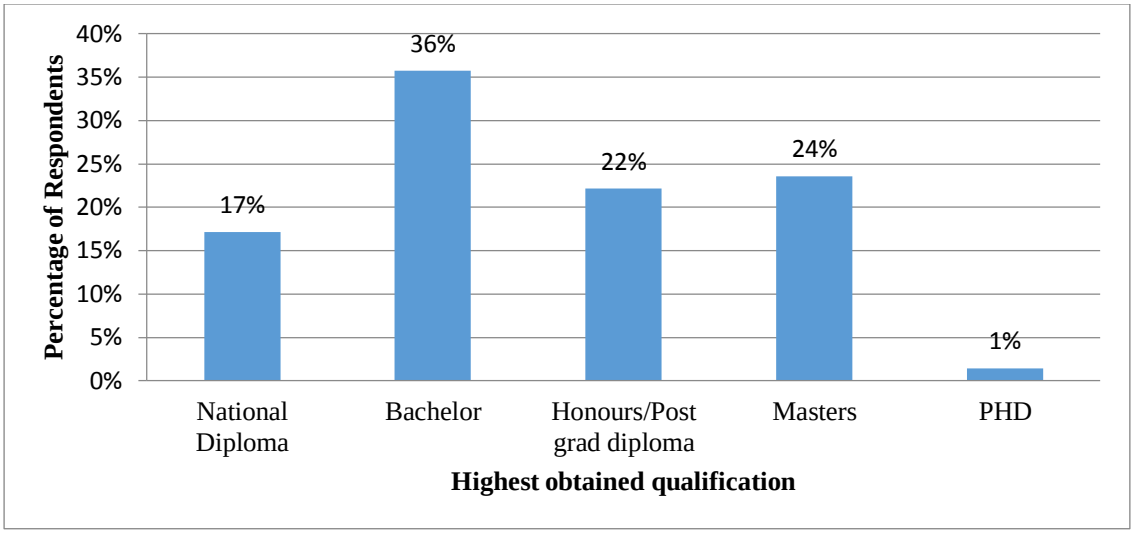


Figure 6: Level of Education

Majority of the respondents (86%) were not PMI certified, implying that only 14% were PMI certified. This is illustrated in the pie chart below;

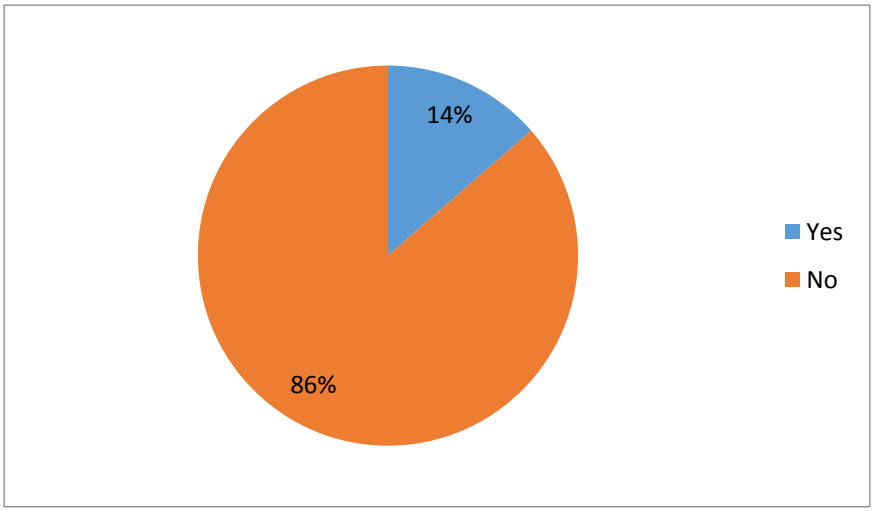


Figure 7: PMI certified

5.2.2 Reliability/ Internal Consistency

In order to determine the reliability of the differenT construct, cronbach's Alpha was used. Social media usage was the first one as follows;

A-Social Media

The table below shows the Cronbach's Alpha for the construct Social Media usage (Cronbach's Alpha = 0.279). This implies that the items in the social media usage construct could not be grouped together to compute a summated scale for the construct. Thus, further analysis is conducted using individual items.

Table 11: Reliability statistics for social media construct

Reliability Statistics	
Cronbach's Alpha	N of Items
0.224	3

Table 12: Reliability of social media after deletion of few items

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Synchron comm tool Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	3.19	1.303	.057	.323
Asynchronous comm tool Asynchronous communication tools :Email, Intranet, enterprise software applications	3.71	1.641	.152	.129
Collaborat tool Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	3.12	1.079	.173	.015

The deletion of any of the items would not improve the Cronbach's Alpha as shown in the last column of the table above.

B-ICT Project performance

The scale for the item "The project had budget overrun" was reversed since it was negatively presented to the respondents. The item became "The project did not have a budget overrun". The Cronbach's Alpha for ICT Project performance was computed and resulted in a value of 0.354 and deletion on any of the 6 items in the scale" would not improve the Cronbach's Alpha to acceptable levels (above 0.5) as shown in the Item-Total Statistics table. Thus, "ICT Project performance" items could not be grouped together to form a summated scale for the construct and individual items will be used for further analysis.

Table 13: Reliability statistics for ICT project performance

Reliability Statistics	
Cronbach's Alpha	N of Items
.354	6

Table 14: Reliability of ICT project performance when Item deleted

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The schedule of the project was the same as planned	12.471	6.280	.219	.269
The project was delivered ahead of schedule	12.343	6.457	.186	.296
The project did not have a budget overrun	11.479	7.949	-.016	.428
The cost objective were met for the project	12.679	6.277	.300	.213
The project produced a high quality solution/service	13.043	7.638	.121	.338
The project deliverables complied with the contractual requirements	13.093	7.337	.183	.303

Again, the deletion of any of the items would not improve the Cronbach's Alpha as shown in the last column of the table above.

C-Knowledge Management

The results below show that there is very good internal consistency among the items measuring knowledge management since the Cronbach's Alpha was 0.799. Thus the items could be grouped together to form a summated scale for the Knowledge management construct.

Table 15: Reliability statistics for knowledge management

Reliability Statistics	
Cronbach's Alpha	N of Items
.799	8

Table 16: Reliability Item total statistics for KM

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Communication tools were used to support Knowledge management practice	13.302	18.560	.480	.781
Collaborative tools/Knowledge management system/ Database management system were used to support knowledge management practice	13.281	18.000	.489	.779
Non-Computer mediated communication tools were used to support knowledge management practice	12.799	17.177	.405	.799
Knowledge was shared among the project team members	13.453	17.583	.524	.774
Knowledge was accessible to those who needed it	13.360	17.232	.551	.769
Feedback from past projects and experiences was used to improve this project	13.302	17.517	.526	.773
The project re-used knowledge into practice	13.201	18.075	.531	.773
Knowledge management added value to project management	13.410	17.157	.611	.761

D-Summated scale

A summated scale was calculated for the knowledge management constructs by finding the average of the items in each construct. Further analysis was conducted using the summated scale for the construct. The descriptive statistics for the construct are shown below.

Table 17: Descriptive statistics for KM construct

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Knowledge Management	140	1.00	3.63	1.893	0.590

1= Strongly Agree, 2 = Agree to some extent, 3 = Neutral, 4 = Disagree to some extent, 5 = Strongly disagree.

The results shows a high response rate on 2- agree to some extent- (mean = 1.893).

5.2.3 Normality Test

Normality tests were carried out on the data to decide on the appropriate statistical techniques to use to measure the relationship between ICT Project performance and other variables. The Kolmogorov-Smirnov test was run on each variable that will be used in the analysis. Hypotheses for each of these factors were as follow:

Ho: the normal distribution does not fit the data well

Ha: the normal distribution fits the data well

Table 18: One sample Kolmogorov -Smirnov test

One-Sample Kolmogorov-Smirnov Test								
	N	Normal Parameters[a,b]		Most Extreme Differences			Kolmogorov-SmirnovZ	Asymp. Sig. (2-tailed)
		Mean	Std. Deviation	Absolute	Positive	Negative		
Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	140	1.82	0.867	0.278	0.278	-0.172	3.292	0.000
Asynchronous communication tools :Email, Intranet, enterprise software applications	140	1.31	0.561	0.451	0.451	-0.292	5.333	0.000
Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	139	1.89	0.882	0.24	0.24	-0.156	2.827	0.000
Face-to-face interaction	140	1.45	0.723	0.397	0.397	-0.267	4.703	0.000
Telephone	140	1.579	0.7204	0.346	0.346	-0.211	4.096	0.000
Hand written report	140	2.479	0.9481	0.236	0.236	-0.166	2.792	0.000
The schedule of the project was the same as planned	140	2.55	1.165	0.274	0.274	-0.165	3.247	0.000
The project was delivered ahead of schedule	140	2.679	1.1646	0.234	0.234	-0.143	2.771	0.000
The project did not have a budget overrun	140	3.543	1.0275	0.236	0.164	-0.236	2.794	0.000
The cost objective were met for the project	140	2.343	1.0372	0.23	0.23	-0.142	2.716	0.000
The project produced a high quality solution/service	140	1.979	0.8437	0.233	0.233	-0.189	2.754	0.000
The project deliverables complied with the contractual requirements	140	1.929	0.8536	0.274	0.274	-0.205	3.24	0.000
Knowledge Management	140	1.8935	0.58999	0.128	0.128	-0.065	1.519	0.020
a. Test distribution is Normal.								
b. Calculated from data.								

5.3 BIVARIATE ANALYSIS

Correlation analysis was conducted to assess if there was a likelihood of experiencing multicolinearity. The results are shown below.

Table 19: Correlation analysis

			synchroncommtool	Asynchronouscommtool	collaborattool	facetoface	telephone	Handwritenreport	PPERFTIM1	PPERFTIM2	PPERFCOST1	PPERFCOST2	PPERFFUN1	PPERFFUN2	KM
Kendall's tau_b	Synchroncommtool	Correlation Coefficient	1.000	.011	.068	.086	.076	-.023	.022	-.010	.043	-.094	.049	.061	.037
		Sig. (2-tailed)	.	.889	.366	.264	.317	.759	.766	.893	.558	.197	.514	.415	.586
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	Asynchronousco mmtool	Correlation Coefficient	.011	1.000	.174*	.089	.051	.056	-.050	-.038	.061	-.074	.091	.125	.095
		Sig. (2-tailed)	.889	.	.026	.271	.522	.465	.512	.613	.423	.332	.240	.111	.177
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	Collaborattool	Correlation Coefficient	.068	.174*	1.000	.007	-.056	.086	-.048	-.088	-.114	.040	-.035	-.040	.168*
		Sig. (2-tailed)	.366	.026	.	.925	.465	.242	.509	.223	.120	.586	.643	.595	.013
		N	139	139	139	139	139	139	139	139	139	139	139	139	139
	Facetoface	Correlation Coefficient	.086	.089	.007	1.000	.115	.151*	.032	.070	.021	-.061	.032	.080	-.007

		Sig. (2-tailed)	.264	.271	.925	.	.142	.046	.674	.346	.784	.415	.679	.300	.915
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	Telephone	Correlation Coefficient	.076	.051	-.056	.115	1.000	.334**	.053	.134	.063	.178*	.019	.082	.064
		Sig. (2-tailed)	.317	.522	.465	.142	.	.000	.479	.069	.402	.017	.801	.283	.352
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	Handwrittenreport	Correlation Coefficient	-.023	.056	.086	.151*	.334**	1.000	.103	.065	.024	.005	-.026	.021	.030
		Sig. (2-tailed)	.759	.465	.242	.046	.000	.	.151	.360	.742	.950	.727	.772	.649
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	PPERFTIM1	Correlation Coefficient	.022	-.050	-.048	.032	.053	.103	1.000	.307**	.009	.090	.060	-.007	.138*
		Sig. (2-tailed)	.766	.512	.509	.674	.479	.151	.	.000	.897	.205	.409	.920	.035
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	PPERFTIM2	Correlation Coefficient	-.010	-.038	-.088	.070	.134	.065	.307**	1.000	-.042	.138	-.132	.045	.111
		Sig. (2-tailed)	.893	.613	.223	.346	.069	.360	.000	.	.556	.050	.066	.534	.089
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	PPERFCOST1	Correlation Coefficient	.043	.061	-.114	.021	.063	.024	.009	-.042	1.000	.000	-.041	.029	-.101
		Sig. (2-tailed)	.558	.423	.120	.784	.402	.742	.897	.556	.	.998	.572	.692	.125

		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	PPERFCOST2	Correlation Coefficient	-.094	-.074	.040	-.061	.178*	.005	.090	.138	.000	1.000	.204**	.173*	.228**
		Sig. (2-tailed)	.197	.332	.586	.415	.017	.950	.205	.050	.998	.	.005	.018	.001
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	PPERFFUN1	Correlation Coefficient	.049	.091	-.035	.032	.019	-.026	.060	-.132	-.041	.204**	1.000	.278**	.171*
		Sig. (2-tailed)	.514	.240	.643	.679	.801	.727	.409	.066	.572	.005	.	.000	.011
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	PPERFFUN2	Correlation Coefficient	.061	.125	-.040	.080	.082	.021	-.007	.045	.029	.173*	.278**	1.000	.158*
		Sig. (2-tailed)	.415	.111	.595	.300	.283	.772	.920	.534	.692	.018	.000	.	.019
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
	KM	Correlation Coefficient	.037	.095	.168*	-.007	.064	.030	.138*	.111	-.101	.228**	.171*	.158*	1.000
		Sig. (2-tailed)	.586	.177	.013	.915	.352	.649	.035	.089	.125	.001	.011	.019	.
		N	140	140	139	140	140	140	140	140	140	140	140	140	140
*. Correlation is significant at the 0.05 level (2-tailed).															
**. Correlation is significant at the 0.01 level (2-tailed).															

5.4 MULTIVARIATE ANALYSIS

Social media and knowledge management factors were tested as predictors of ICT project performance. Table of the Appendix outlines the testing that relates to the the assumptions of the multiple linear regression models, and the processes followed. Five multiple linear regression models were therefore used in order to test the multivariate associations of a range of variables with each of the dimensions of project performance.

5.4.1 Hypothesis 1: Social media technologies usage is significantly associated with ICT Project performance

H_0: There is no significant association between social media technologies usage and ICT Project performance

H_1: Social media technologies usage is significantly associated with ICT Project performance.

To assess the above hypothesis, regression analysis was conducted with each of the ICT poject performance attributes as the dependent variable against the three attributes for social media technologies as well as non-computer strategies as independent variable. The enter method was used.

1A-The schedule of the project was the same as planned vs social media technologies usage

Table 20: Model summary- the schedule of the project was the same as planned

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.133[a]	.018	-.027	1.1772

a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

Table 21: ANOVA test- the schedule of the project was the same as planned

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.302	6	.550	.397	.880[b]
	Residual	182.928	132	1.386		
	Total	186.230	138			
a. Dependent Variable: The schedule of the project was the same as planned						
b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards Ano, Drop box, Google docs, JIRA., Telephone						

The ANOVA tables for the ICT project performance variable "The schedule of the project was the same as planned" shows that the model is not significant (p-values =0.880 > 0.05). This implies that the null hypothesis could not be rejected and it is concluded that the ICT Project performance variable "The schedule of the project was the same as planned" does not differ with social media usage. The hypothesis testing for individual variables is shown in the coefficients table below.

Table 22: Coefficients table- The schedule of the project was the same as planned

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.399	.470		5.099	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.039	.116	.029	.335	.738
	Asynchronous communication tools :Email, Intranet, enterprise software applications	-.068	.184	-.033	-.369	.713
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.078	.118	-.059	-.659	.511
	Face-to-face interaction	-.021	.141	-.013	-.147	.883
	Telephone	.000	.152	.000	.001	.999
	Hand written report	.144	.116	.118	1.236	.219
a. Dependent Variable: The schedule of the project was the same as planned						

It can be noted that none of the Social media usage variables as well as non-computer variables is significantly associated with ICT Project performance variable "The schedule of the project was the same as planned". This means that the null hypothesis for hypothesis 1 cannot be rejected and it is concluded that there is no significant association between social media technologies usage and ICT Project performance.

1.B The project was delivered ahead of schedule vs social media technologies usage

Table 23: Model sumary- the project was delivered ahead of schedule

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.175[a]	.030	-.014	1.1753
a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone				

Table 24: ANOVA test- the project was delivered ahead of schedule

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.732	6	.955	.692	.657[b]
	Residual	182.340	132	1.381		
	Total	188.072	138			
a. Dependent Variable: The project was delivered ahead of schedule						
b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone						

The ANOVA table for the ICT project performance ' the project was delivered ahead of schedule' shows that the model is not significant (p-value= 0.657). It is concluded that there

is no significant relationship between social media usage and ‘ the project was delivered ahead of schedule’.

Table 25: Coefficient table- the project was delivered ahead of schedule

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.611	.470		5.559	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	-.033	.116	-.024	-.280	.780
	Asynchronous communication tools :Email, Intranet, enterprise software applications	-.087	.183	-.042	-.474	.636
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.121	.118	-.092	-1.026	.307
	Face-to-face interaction	.090	.141	.056	.641	.522
	Telephone	.179	.152	.111	1.180	.240
	Hand written report	.024	.116	.020	.210	.834
a. Dependent Variable: The project was delivered ahead of schedule						

Again, this table confirm the earlier finding that there is no association between social media usage and the attribute of ICT project performance’ the project was delivered ahead of schedule’.

1.C The project did not have a budget overrun vs social media technologies usage

Table 26: Model summary- the project did not have a budget overrun

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.145[a]	.021	-.024	1.0422

a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

Table 27: ANOVA- the project did not have a budget overrun

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.064	6	.511	.470	.829[b]
	Residual	143.382	132	1.086		
	Total	146.446	138			

a. Dependent Variable: The project did not have a budget overrun

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

Table 28: Coefficient table- the project did not have a budget overrun

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.292	.416		7.903	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.048	.103	.041	.468	.641
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.168	.163	.091	1.034	.303
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.101	.105	-.086	-.965	.337
	Face-to-face interaction	-.025	.125	-.017	-.199	.843
	Telephone	.103	.134	.072	.766	.445
	Hand written report	.005	.103	.005	.049	.961
a. Dependent Variable: The project did not have a budget overrun						

1.D The cost objectives were met for the project vs social media technologies usage

Table 29: Model summary- the cost objectives were met for the project

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.248[a]	.062	.019	1.0306
a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone				

Table 30: ANOVA- the cost objectives were met for the project

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.221	6	1.537	1.447	.202[b]
	Residual	140.204	132	1.062		
	Total	149.424	138			

a. Dependent Variable: The cost objective were met for the project

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

Table 31: Coefficient tble- the cost objectives were met for the project

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.500	.412		6.069	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	-.133	.102	-.111	-1.309	.193
	Asynchronous communication tools :Email, Intranet, enterprise software applications	-.209	.161	-.113	-1.303	.195
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	.098	.103	.083	.948	.345
	Face-to-face interaction	-.084	.124	-.059	-.681	.497
	Telephone	.306	.133	.212	2.304	.023
	Hand written report	-.076	.102	-.069	-.745	.457

a. Dependent Variable: The cost objective were met for the project

1.E The project produced a high quality solution/service vs Social media technologies usage

Table 32: Model summary- The project produced a high quality solution

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.146[a]	.021	-.023	.8519

a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

Table 33: ANOVA- the project produced a high quality solution/service

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.085	6	.347	.479	.823[b]
	Residual	95.800	132	.726		
	Total	97.885	138			

a. Dependent Variable: The project produced a high quality solution/service

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

Table 34- Coefficient- the project produced a high quality solution/service

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.846	.340		5.422	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.072	.084	.075	.860	.392
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.148	.133	.099	1.117	.266
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.085	.086	-.089	-.997	.321
	Face-to-face interaction	.040	.102	.034	.390	.697
	Telephone	-.015	.110	-.013	-.141	.888
	Hand written report	-.029	.084	-.032	-.341	.734
a. Dependent Variable: The project produced a high quality solution/service						

1.F The project deliverables complied with the contractual requirements vs social media technologies usage

Table 35: Model summary- the project deliverables complied with the contractual requirements

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.137[a]	.019	-.026	.8677
a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone				

Table 36: ANOVA- the project deliverables complied with the contractyal requirements

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.908	6	.318	.422	.863[b]
	Residual	99.373	132	.753		
	Total	101.281	138			
a. Dependent Variable: The project deliverables complied with the contractual requirements						
b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone						

Table 37: Coefficient- the project deliverables complied with the contractual requirements

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.610	.347		4.643	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.070	.086	.071	.820	.414
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.155	.135	.102	1.149	.253
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.065	.087	-.067	-.745	.458
	Face-to-face interaction	.021	.104	.018	.200	.842
	Telephone	.029	.112	.024	.259	.796
	Hand written report	.014	.086	.016	.163	.871
a. Dependent Variable: The project deliverables complied with the contractual requirements						

5.4.2 Hypothesis 2: Social media technologies usage is significantly associated with knowledge management adoption

H_0: There is no significant relationship between social media technologies usage and knowledge management adoption.

2. H_2: Social media technologies usage is significantly related to knowledge management adoption.

Table 38: Model summary- H2

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.205[a]	.042	-.002	.59213

a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

Table 39: ANOVA-H2

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.029	6	.338	.965	.452[b]
	Residual	46.282	132	.351		
	Total	48.312	138			

a. Dependent Variable: Knowledge Management

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

The p-value for the ANOVA table was 0.452, which is greater than 0.05 and thus null hypothesis could not be rejected. This implies that the null hypothesis could not be rejected even at 10% significance level and it is concluded that social media technologies usage is not related to knowledge management adoption. The hypothesis testing for individual variables is shown in the coefficients table below.

Table 40: Coefficient table-H2

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.515	.237		6.404	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.014	.058	.021	.239	.812
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.063	.092	.060	.682	.497
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	.116	.059	.172	1.943	.054
	Face-to-face interaction	-.020	.071	-.025	-.288	.774
	Telephone	.067	.076	.081	.871	.385
	Hand written report	-.009	.058	-.014	-.149	.882
a. Dependent Variable: Knowledge Management						

The results confirm that social media technologies usage is not related to knowledge management adoption since none of the Social media technology usage variables is individually related to knowledge management adoption. This is because all the p-values are all less than 0.05.

5.4.3 Hypothesis 3: Relationship between Knowledge management and ICT project performance

H_0: There is no significant relationship between knowledge management adoption and ICT project performance.

H_3: Knowledge management adoption is significantly associated with ICT project performance.

Regression analysis was also conducted with each of the 6 ICT Project performance variables as the dependent variable and knowledge management adoption as the independent variable. The summated scale constructs for knowledge management was used. The results are shown below.

3.A Knowledge management adoption is significantly related to ICT project performance - The schedule of the project was the same as planned.

Table 41- Model summary- H3-The schedule of the project was the same as planned

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.208[a]	.043	.036	1.1437
a. Predictors: (Constant), Knowledge Management				

The model with Knowledge management adoption explained 4.3% of variation ICT Project performance (The schedule of the project being the same as planned).

Table 42: ANOVA- H3- The schedule of the project was the same as planned

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.124	1	8.124	6.210	.014[b]
	Residual	180.526	138	1.308		
	Total	188.650	139			
a. Dependent Variable: The schedule of the project was the same as planned						
b. Predictors: (Constant), Knowledge Management						

The p-value for the model was 0.014 which is less than 0.05. This implies that there is a significant relationship between Knowledge management adoption and ICT Project performance performance (The schedule of the project being the same as planned). The coefficients are shown in the table below.

Table 43: Coefficient table- H3

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.774	.326		5.442	.000
	Knowledge Management	.410	.164	.208	2.492	.014
a. Dependent Variable: The schedule of the project was the same as planned						

The model is given by:

$$\text{ICT Project performance (Schedule of the project being the same as planned)} = 1.774 + 0.410\ \text{Knowledge management adoption.}$$

The p-value for Knowledge Management adoption was 0.014 which is less than 0.05 (significance level) and the coefficient of Knowledge management adoption was positive (0.410). This implies that the null hypothesis is rejected in favour of the alternative hypothesis. Thus, it is concluded that Knowledge management adoption is positively related to ICT project performance (The schedule of the project being the same as planned).

3.B. Knowledge management adoption is significantly associated with ICT project performance - The project was delivered ahead of schedule.

Table 44- Model summary- H3- The project was delivered ahead of schedule

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.163[a]	.026	.019	1.1533
a. Predictors: (Constant), Knowledge Management				

Table 45- ANOVA-H3- the project was delivered ahead of schedule

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.984	1	4.984	3.747	.055[b]
	Residual	183.552	138	1.330		
	Total	188.536	139			
a. Dependent Variable: The project was delivered ahead of schedule						
b. Predictors: (Constant), Knowledge Management						

Table 46: Coefficient table- H3- the project was delivered ahead of schedule

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.071	.329		6.300	.000
	Knowledge Management	.321	.166	.163	1.936	.055
a. Dependent Variable: The project was delivered ahead of schedule						

The p-value for Knowledge Management adoption was 0.055 which is greater than 0.05 (significance level). This implies that the null hypothesis cannot be rejected in favour of the alternative hypothesis. Thus, it is concluded that Knowledge management adoption is negatively related to ICT project performance (The schedule of the project was delivered ahead of schedule).

3.C. Knowledge management adoption is significantly associated with ICT project performance - The project did not have a budget overrun.

Table 47: Model summary- the project did not have a budget overrun

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.164[a]	.027	.020	1.0173
a. Predictors: (Constant), Knowledge Management				

Table 48: ANOVA- the project did not have a budget overrun

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.925	1	3.925	3.793	.054[b]
	Residual	142.818	138	1.035		
	Total	146.743	139			
a. Dependent Variable: The project did not have a budget overrun						
b. Predictors: (Constant), Knowledge Management						

Table 49: Coefficients table- the project dici not have a budget overrun

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.082	.290		14.078	.000
	Knowledge Management	-.285	.146	-.164	-1.947	.054
a. Dependent Variable: The project did not have a budget overrun						

The p-value for Knowledge Management adoption was 0.054 which is greater than 0.05 (significance level). This implies that the null hypothesis cannot be rejected in favour of the alternative hypothesis. Thus, it is concluded that Knowledge management adoption is negatively related to ICT project performance (The project did not have budget overrun).

3.D. Knowledge management adoption is significantly associated with ICT project performance - The cost objective was met for the project.

Table 50: Model summary- the cost objective was met for the project

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.271[a]	.074	.067	1.0019
a. Predictors: (Constant), Knowledge Management				

Table 51: ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.006	1	11.006	10.964	.001[b]
	Residual	138.537	138	1.004		
	Total	149.543	139			
a. Dependent Variable: The cost objective were met for the project						
b. Predictors: (Constant), Knowledge Management						

Table 52: Coefficients table- the cost objective were met for the project

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.440	.286		5.041	.000
	Knowledge Management	.477	.144	.271	3.311	.001
a. Dependent Variable: The cost objective were met for the project						

The p-value for knowledge management adoption was 0.001 which is less than 0.05 (significance level) and the coefficient of knowledge management adoption was positive (0.477). This implies that the null hypothesis is rejected in favour of the alternative hypothesis. Thus, it is concluded that knowledge management adoption is positively related to ICT project performance (The cost objective was met for the project).

3.E. Knowledge management adoption is significantly associated with ICT project performance - The project produced a high quality solution/service.

Table 53: Model summary- H3- the project produced a high quality solution/service

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.201[a]	.041	.034	.8294
a. Predictors: (Constant), Knowledge Management				

Table 54`: ANOVA-H3- the project produced a high quality solution/service

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.011	1	4.011	5.831	.017[b]
	Residual	94.925	138	.688		
	Total	98.936	139			
a. Dependent Variable: The project produced a high quality solution/service						
b. Predictors: (Constant), Knowledge Management						

Table 55- Coefficients table- H3-the project produced a high quality solution/service

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.433	.236		6.064	.000
	Knowledge Management	.288	.119	.201	2.415	.017
a. Dependent Variable: The project produced a high quality solution/service						

The p-value for knowledge Management adoption was 0.017 which is less than 0.05 (significance level) and the coefficient of knowledge management adoption was positive (0.288). This implies that the null hypothesis is rejected in favour of the alternative hypothesis. Thus, it is concluded that knowledge management adoption is positively related to ICT project performance (The project produced a high quality solution/service).

3.F. Knowledge management adoption is significantly associated with ICT project performance - The project deliverables complied with the contractual requirements.

Table 56: Model summary-H3- The project deliverables complied with the contractual requirements

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.105[a]	.011	.004	.8520
a. Predictors: (Constant), Knowledge Management				

Table 57: ANOVA-H3

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.121	1	1.121	1.544	.216[b]
	Residual	100.165	138	.726		
	Total	101.286	139			
a. Dependent Variable: The project deliverables complied with the contractual requirements						
b. Predictors: (Constant), Knowledge Management						

Table 58: Coefficients table- H3- the project deliverables complied with the contractual requirements

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.640	.243		6.755	.000
	Knowledge Management	.152	.122	.105	1.243	.216
a. Dependent Variable: The project deliverables complied with the contractual requirements						

The p-value for Knowledge Management adoption was 0.216 which is greater than 0.05. This implies that the null hypothesis is cannot be rejected in favour of the alternative hypothesis. Thus, it is concluded that Knowledge management adoption is negatively related to ICT project performance (The project deliverables complied with the contractual requirements).

5.4.4 Hypothesis 4: Knowledge management mediates the relationship between ICT project performance and social media usage

H_0: Knowledge management does Not mediate the relationship between social media usage and ICT project performance .

H4: Knowledge management mediates the relationship between social media usage and ICT project .

Regression analysis was conducted with each of the ICT project performance as dependent variables and the social media usage as independent variables for one model (model 1). The model is compared with model 2 that has social media usage as well as knowledge management as independent variables. The change in the F-value is assessed to check if knowledge management is a mediator variable for the relationship between social media usage and ICT project performance. This method by Sobel (1982) , calculates the indirect effect by multiplying two regression coefficients. The two coefficients are obtained from two regression models.

4.A. The relationship between social media usage and ICT project performance (The schedule of the project was the same as planned) is mediated by knowledge management.

Table 59: Model summary-H4

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.133[a]	.018	-.027	1.1772	.018	.397	6	132	.880
2	.255[b]	.065	.015	1.1527	.048	6.663	1	131	.011
a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone									
b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management									

The results shows that the second model with knowledge management adoption resulted in a significant change in R-square from 1.8% to 6.5% (Sig. F Change = 0.011< 0.05). The ANOVA tables below however show that the model with knowledge management is still not significant in explaining the ICT Project performance.

Table 60: ANOVA-H4

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.302	6	.550	.397	.880[b]
	Residual	182.928	132	1.386		
	Total	186.230	138			
2	Regression	12.156	7	1.737	1.307	.252[c]
	Residual	174.074	131	1.329		
	Total	186.230	138			

a. Dependent Variable: The schedule of the project was the same as planned

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

c. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Tabe 61: Coefficients table-H4

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.399	.470		5.099	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.039	.116	.029	.335	.738
	Asynchronous communication tools :Email, Intranet, enterprise software applications	-.068	.184	-.033	-.369	.713
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.078	.118	-.059	-.659	.511
	Face-to-face interaction	-.021	.141	-.013	-.147	.883
	Telephone	.000	.152	.000	.001	.999
	Hand written report	.144	.116	.118	1.236	.219
2	(Constant)	1.736	.527		3.292	.001
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.033	.114	.025	.288	.774
	Asynchronous communication tools :Email, Intranet, enterprise software applications	-.095	.180	-.046	-.529	.598
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.128	.117	-.097	-1.094	.276
	Face-to-face interaction	-.012	.138	-.007	-.085	.932
	Telephone	-.029	.149	-.018	-.194	.846
	Hand written report	.147	.114	.121	1.296	.197
	Knowledge Management	.437	.169	.223	2.581	.011

a. Dependent Variable: The schedule of the project was the same as planned

The p-values for individual Social Media usage variables indicates that still none of the variable of the individual social media usage variables is significant in predicting ICT Project performance (The schedule of the project was the same as planned). Thus, the null hypothesis cannot be rejected and it is concluded that for the ICT Project performance variable (The schedule of the project was the same as planned), the relationship between social media usage and ICT project performance is not mediated by knowledge management.

4.B. Knowledge management mediates the relationship between social media usage and ICT project performance -The project was delivered ahead of schedule

Table 62: Model summary-H4- the project was delivered ahead of schedule

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.175[a]	.030	-.014	1.1753	.030	.692	6	132	.657
2	.249[b]	.062	.012	1.1603	.032	4.437	1	131	.037

a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Table 63- Anova-H4

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.732	6	.955	.692	.657[b]
	Residual	182.340	132	1.381		
	Total	188.072	138			
2	Regression	11.705	7	1.672	1.242	.284[c]
	Residual	176.367	131	1.346		
	Total	188.072	138			
a. Dependent Variable: The project was delivered ahead of schedule						
b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone						
c. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management						

Table 64: Coefficiensts table-H4- the project was delivered ahead of schedule

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.611	.470		5.559	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	-.033	.116	-.024	-.280	.780
	Asynchronous communication tools :Email, Intranet, enterprise software applications	-.087	.183	-.042	-.474	.636

	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.121	.118	-.092	-1.026	.307
	Face-to-face interaction	.090	.141	.056	.641	.522
	Telephone	.179	.152	.111	1.180	.240
	Hand written report	.024	.116	.020	.210	.834
2	(Constant)	2.066	.531		3.893	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	-.038	.115	-.028	-.328	.744
	Asynchronous communication tools :Email, Intranet, enterprise software applications	-.110	.181	-.053	-.604	.547
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.163	.118	-.123	-1.376	.171
	Face-to-face interaction	.098	.139	.061	.702	.484
	Telephone	.155	.150	.096	1.032	.304
	Hand written report	.027	.115	.022	.240	.811
	Knowledge Management	.359	.171	.182	2.106	.037
a. Dependent Variable: The project was delivered ahead of schedule						

The p-values for individual Social Media usage variables indicates that still none of the variable of the individual social media usage variables is significant in predicting ICT Project performance (The project was delivered ahead of schedule). Thus, the null hypothesis cannot be rejected and it is concluded that for the ICT Project performance variable (The project was delivered ahead of schedules), the relationship between social media usage and ICT project performance is not mediated by knowledge management.

4.C. Knowledge management mediates the relationship between social media usage and ICT project performance (The project did not have a budget overrun)

Table 65: Model summary- the project did not have a budget overrun

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.145[a]	.021	-.024	1.0422	.021	.470	6	132	.829
2	.223[b]	.050	-.001	1.0308	.029	3.943	1	131	.049

a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Table 66: ANOVA- the project did not have a budget overrun

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.064	6	.511	.470	.829[b]
	Residual	143.382	132	1.086		
	Total	146.446	138			
2	Regression	7.254	7	1.036	.975	.452[c]
	Residual	139.192	131	1.063		
	Total	146.446	138			

a. Dependent Variable: The project did not have a budget overrun

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

c. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Table 67: Coefficients table

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.292	.416		7.903	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.048	.103	.041	.468	.641
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.168	.163	.091	1.034	.303
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.101	.105	-.086	-.965	.337
	Face-to-face interaction	-.025	.125	-.017	-.199	.843
	Telephone	.103	.134	.072	.766	.445
	Hand written report	.005	.103	.005	.049	.961
2	(Constant)	3.747	.472		7.946	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.052	.102	.044	.514	.608
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.187	.161	.102	1.161	.248
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.066	.105	-.057	-.630	.529
	Face-to-face interaction	-.031	.124	-.022	-.251	.802
	Telephone	.123	.133	.086	.923	.358
	Hand written report	.002	.102	.002	.024	.981
	Knowledge Management	-.301	.152	-.173	-1.986	.049
a. Dependent Variable: The project did not have a budget overrun						

The p-values for individual Social Media usage variables indicates that still none of the variable of the individual social media usage variables is significant in predicting ICT Project performance (The project did not have a budget overrun). Thus, the null hypothesis cannot be rejected and it is concluded that for the ICT Project performance variable (The project did not have a budget overrun), the relationship between social media usage and ICT project performance is not mediated by knowledge management.

4.D. Knowledge management mediates the relationship between social media usage and ICT project performance (The cost objective was met for the project)

Table 68: Model summary- the cost objective was met for the project

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.248[a]	.062	.019	1.0306	.062	1.447	6	132	.202
2	.363[b]	.132	.085	.9952	.070	10.563	1	131	.001

a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Table 69: ANOVA- the cost objective was met for the project

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.221	6	1.537	1.447	.202[b]
	Residual	140.204	132	1.062		
	Total	149.424	138			
2	Regression	19.682	7	2.812	2.839	.009[c]
	Residual	129.742	131	.990		
	Total	149.424	138			

a. Dependent Variable: The cost objective were met for the project

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

c. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Table 70: Coefficients table- H4- the cost objective was met for the project

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.500	.412		6.069	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	-.133	.102	-.111	-1.309	.193
	Asynchronous communication tools :Email, Intranet, enterprise software applications	-.209	.161	-.113	-1.303	.195
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	.098	.103	.083	.948	.345
	Face-to-face interaction	-.084	.124	-.059	-.681	.497
	Telephone	.306	.133	.212	2.304	.023
	Hand written report	-.076	.102	-.069	-.745	.457
2	(Constant)	1.779	.455		3.908	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	-.140	.098	-.117	-1.423	.157
	Asynchronous communication tools :Email, Intranet, enterprise software applications	-.239	.155	-.129	-1.539	.126
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	.043	.101	.037	.425	.671
	Face-to-face interaction	-.074	.119	-.052	-.623	.534
	Telephone	.275	.129	.190	2.133	.035
	Hand written report	-.072	.098	-.066	-.730	.467
	Knowledge Management	.475	.146	.270	3.250	.001
a. Dependent Variable: The cost objective were met for the project						

The p-values for individual social media usage variables indicate that the variables telephone is significant in predicting ICT project performance (The cost objectives were met for the project). Thus, the null hypothesis can be rejected and it is concluded that for the ICT Project performance variable (The cost objective were met for the project), the relationship between social media usage and ICT project performance is mediated by knowledge management.

4.E. Knowledge management mediates the relationship between social media usage and ICT project performance (The project produced a high quality solution/service)

Table 71: Model summary- the project produced a high quality solution

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.146[a]	.021	-.023	.8519	.021	.479	6	132	.823
2	.261[b]	.068	.018	.8344	.047	6.603	1	131	.011

a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Table 72: ANOVA- The project produced a high quality solution service

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.085	6	.347	.479	.823[b]
	Residual	95.800	132	.726		
	Total	97.885	138			
2	Regression	6.682	7	.955	1.371	.223[c]
	Residual	91.203	131	.696		
	Total	97.885	138			

a. Dependent Variable: The project produced a high quality solution/service

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

c. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Table 73: Coefficients table- the project produced a high quality solution

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.846	.340		5.422	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.072	.084	.075	.860	.392
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.148	.133	.099	1.117	.266
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.085	.086	-.089	-.997	.321
	Face-to-face interaction	.040	.102	.034	.390	.697
	Telephone	-.015	.110	-.013	-.141	.888
	Hand written report	-.029	.084	-.032	-.341	.734
2	(Constant)	1.368	.382		3.585	.000
	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.068	.082	.070	.824	.411
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.129	.130	.085	.986	.326
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.122	.085	-.127	-1.432	.154
	Face-to-face interaction	.046	.100	.040	.462	.645
	Telephone	-.036	.108	-.031	-.337	.736
	Hand written report	-.026	.082	-.029	-.315	.753
	Knowledge Management	.315	.123	.221	2.570	.011
a. Dependent Variable: The project produced a high quality solution/service						

The p-values for individual Social Media usage variables indicates that still none of the variable of the individual social media usage variables is significant in predicting ICT Project performance – the project produced a high quality solution. Thus, the null hypothesis cannot be rejected and it is concluded that for the ICT Project performance variable- the project produced a high quality solution/service, the relationship between social media usage and ICT project performance is not mediated by knowledge management.

4.F. Knowledge management mediates the relationship between social media usage and ICT project performance (The project deliverables complied with the contractual requirements)

Table 74: Model summary- the project deliverables complied with the contractual requirements

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.137[a]	.019	-.026	.8677	.019	.422	6	132	.863
2	.173[b]	.030	-.022	.8660	.011	1.491	1	131	.224

a. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Table 75: ANOVA

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.908	6	.318	.422	.863[b]
	Residual	99.373	132	.753		
	Total	101.281	138			
2	Regression	3.026	7	.432	.576	.774[c]
	Residual	98.255	131	.750		
	Total	101.281	138			

a. Dependent Variable: The project deliverables complied with the contractual requirements

b. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone

c. Predictors: (Constant), Hand written report, Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM, Asynchronous communication tools :Email, Intranet, enterprise software applications, Face-to-face interaction, Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA., Telephone, Knowledge Management

Table 76: Coefficients table- the project deliverables complied with the contractual requirements

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.610	.347		4.643	.000
	Synchronous communication tools :live chat– Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.070	.086	.071	.820	.414
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.155	.135	.102	1.149	.253
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.065	.087	-.067	-.745	.458
	Face-to-face interaction	.021	.104	.018	.200	.842
	Telephone	.029	.112	.024	.259	.796
	Hand written report	.014	.086	.016	.163	.871
2	(Constant)	1.374	.396		3.469	.001
	Synchronous communication tools :live chat– Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	.068	.085	.069	.796	.428
	Asynchronous communication tools :Email, Intranet, enterprise software applications	.146	.135	.095	1.076	.284
	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	-.083	.088	-.085	-.939	.349
	Face-to-face interaction	.024	.104	.020	.231	.818
	Telephone	.019	.112	.016	.167	.868
	Hand written report	.015	.085	.017	.179	.858
	Knowledge Management	.155	.127	.107	1.221	.224
a. Dependent Variable: The project deliverables complied with the contractual requirements						

The p-values for individual Social Media usage variables indicates that still none of the variable of the individual social media usage variables is significant in predicting ICT Project performance – the project deliverables complied with the contractual requirements. Thus, the null hypothesis cannot be rejected and it is concluded that for the ICT Project performance

variable- the project deliverables complied with the contractual requirements, the relationship between social media usage and ICT project performance is not mediated by knowledge management.

5.4.5 Hypothesis 5: Project type moderates the relationship between ICT project performance and Knowledge management

H_0: Project type does NOT moderates the relationship between knowledge management and ICT project performance.

H5: Project type acts moderates the relationship between knowledge management and ICT project performance.

Each of the 7 project type variables were tested individually on whether they moderate the relationship between knowledge management and ICT project performance. The results are shown below**.**

5.A. Project type is a moderator between knowledge management and ICT project performance (The schedule of the project was the same as planned)

The first model was fitted with knowledge management adoption as the independent variable explaining ICT Project performance for the total sample of 140 respondents. The model explained 4.3% of variation in ICT Project performance (The schedule of the project was the same as planned) as shown below. The same model was then fitted splitting the sample according to project type for the seven project type variable.

Table 77: Model summary H5

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.208[a]	.043	.036	1.1437
a. Predictors: (Constant), Knowledge Management				

Table 78: ANOVA-H5

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	8.124	1	8.124	6.210	.014[b]
	Residual	180.526	138	1.308		
	Total	188.650	139			
a. Dependent Variable: The schedule of the project was the same as planned						
b. Predictors: (Constant), Knowledge Management						

Table 79: Coefficients table

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.774	.326		5.442	.000
	Knowledge Management	.410	.164	.208	2.492	.014
a. Dependent Variable: The schedule of the project was the same as planned						

With moderator Time taken to complete project

The time was split into 2 parts, that is up to 6 months and more than 6 months.

Table 80: Model summary for time as moderator

Model Summary					
Time taken to complete your project in months	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Up to 6 months	1	.067[a]	.004	-.008	1.0566
More than 6 months	1	.394[a]	.155	.141	1.1740
a. Predictors: (Constant), Knowledge Management					

Table 81: ANOVA for time as moderator

ANOVA[a]							
Time taken to complete your project in months	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to 6 months	1	Regression	.386	1	.386	.345	.558[b]
		Residual	85.969	77	1.116		
		Total	86.354	78			
More than 6 months	1	Regression	14.909	1	14.909	10.817	.002[b]
		Residual	81.321	59	1.378		
		Total	96.230	60			
a. Dependent Variable: The schedule of the project was the same as planned							
b. Predictors: (Constant), Knowledge Management							

Table 82: Coefficients table- time as moderator

Coefficients[a]							
Time taken to complete your project in months	Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
			B	Std. Error	Beta		
Up to 6 months	1	(Constant)	2.137	.409		5.232	.000
		Knowledge Management	.119	.203	.067	.588	.558
More than 6 months	1	(Constant)	1.230	.497		2.475	.016
		Knowledge Management	.842	.256	.394	3.289	.002
a. Dependent Variable: The schedule of the project was the same as planned							

The model for respondents who took up to 6 months to complete their project explained 6.6% ofvariation in project performance (The schedule of the project was the same as planned). On the other hand the model for respondents who took more than 6 months to complete their project explained 39.4% of variation in project performance (The schedule of the project was the same as planned).

For respondents with projects up to 6 months the model is not significant while the model for respondents who took more than 6 months to complete their project was significant (p-value= 0.002). This implies that for "Time taken to complete your project in months" project type acts as a moderator between knowledge management and ICT project performance (The schedule of the project was the same as planned). The differences in the relationships depending on project type are shown in the scatter plots below.

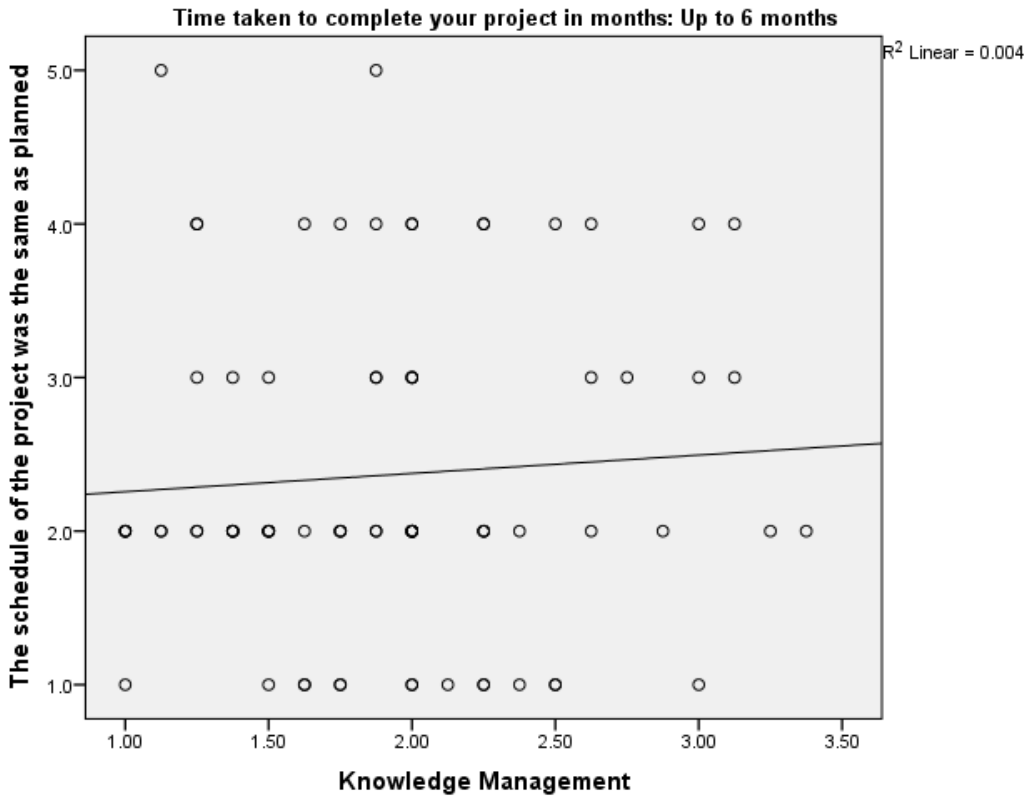


Figure 8A: Scatter plots-time as moderator

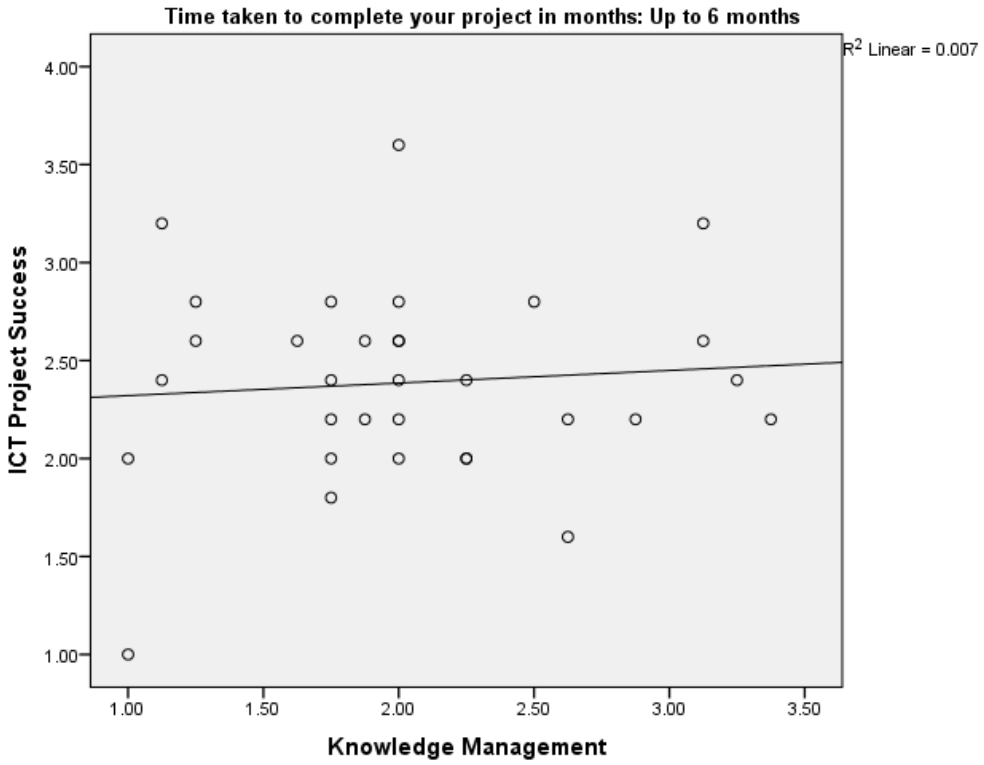


Figure 8B: Scatter plots- time as moderator

Project size

Project size was split into 2 i.e. Up to R100 000 and above R100 000

Table 83: ANOVA- project cost as moderator

ANOVA[a]							
Project size	Model		Sum of Squares	Df	Mean Square	F	Sig.
Up to R100 000	1	Regression	.048	1	.048	.046	.831[b]
		Residual	89.395	86	1.039		
		Total	89.443	87			
More than R100 000	1	Regression	17.341	1	17.341	11.132	.002[b]
		Residual	77.889	50	1.558		
		Total	95.231	51			
a. Dependent Variable: The schedule of the project was the same as planned							
b. Predictors: (Constant), Knowledge Management							

Table 84: Coefficients table- Project cost as moderator

Coefficients[a]							
Project Size	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to R100 000	1	(Constant)	2.337	.402		5.811	.000
		Knowledge Management	.043	.201	.023	.214	.831
More than R100 000	1	(Constant)	1.153	.514		2.240	.030
		Knowledge Management	.879	.264	.427	3.336	.002
a. Dependent Variable: The schedule of the project was the same as planned							

For respondents with projects size up to R100 000 the model is not significant while the model for respondents with a project size of more than R100 000 to complete their project was significant (p-value= 0.002). This implies that for "project size" project type acts as a moderator between knowledge management and ICT project performance (The schedule of the project was the same as planned). The differences in the relationships depending on project type are shown in the scatter plots below.

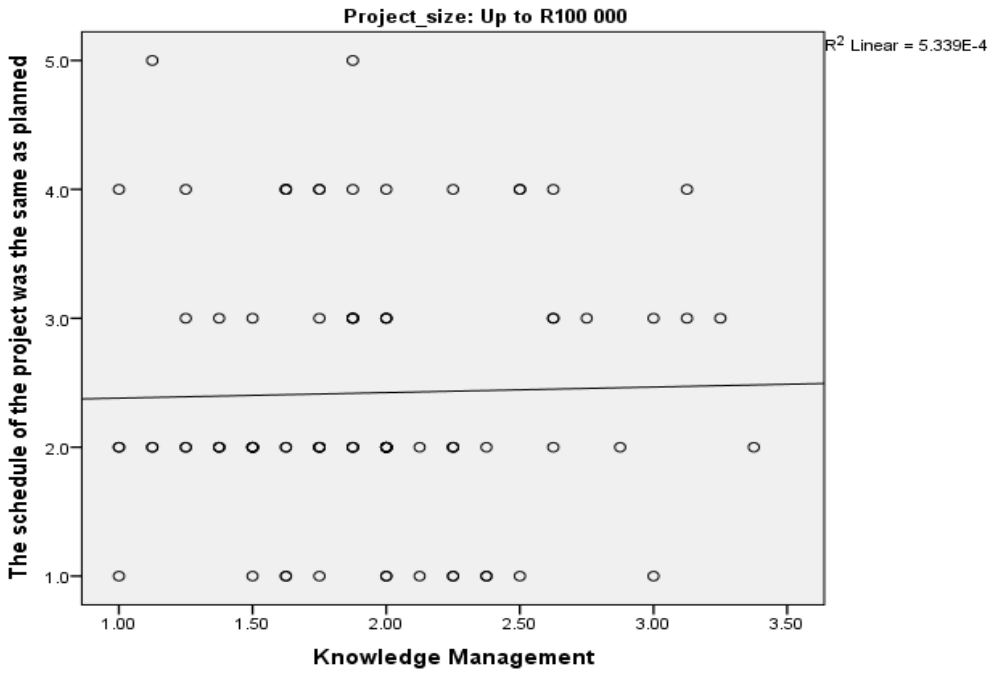


Figure 9A: Scatter plot- project cost as moderator

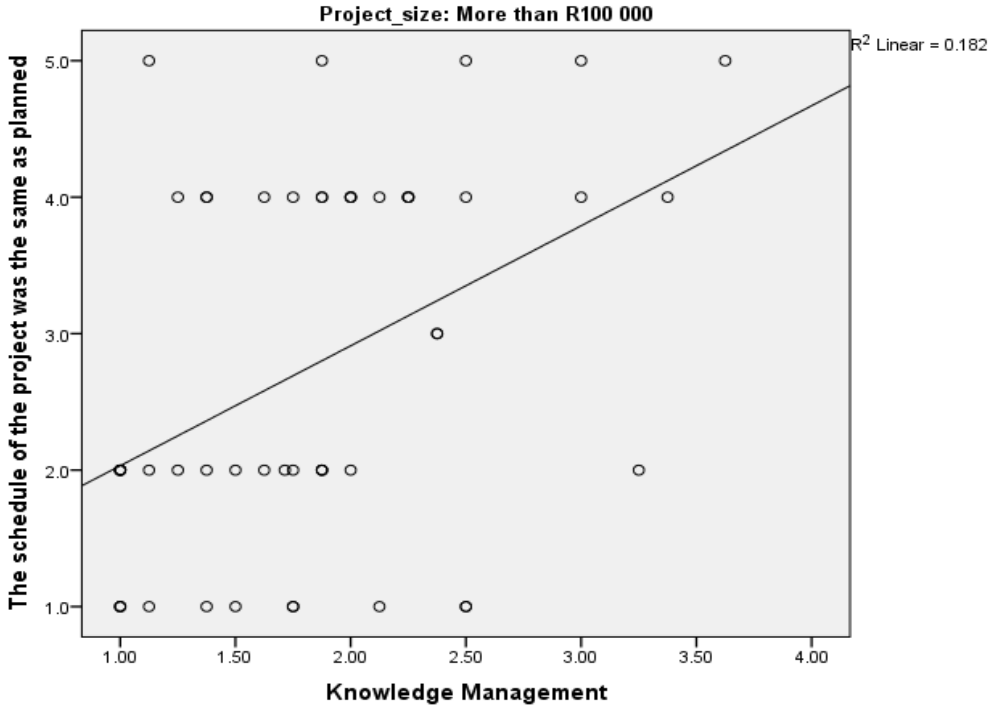


Figure 9B: Scatter plot- project cost as moderator

Number of people who worked on the Project

Number of people who worked on the projects were split into 2 i.e. Up to 10 people and above 10.

Table 85: ANOVA- team size as moderator

ANOVA[a]							
Number of People Involved	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to 10	1	Regression	1.555	1	1.555	1.383	.242[b]
		Residual	110.235	98	1.125		
		Total	111.790	99			
More than 10	1	Regression	9.526	1	9.526	6.201	.017[b]
		Residual	58.374	38	1.536		
		Total	67.900	39			
a. Dependent Variable: The schedule of the project was the same as planned							
b. Predictors: (Constant), Knowledge Management							

Table 86: Coefficients table- team size as moderator

Coefficients[a]							
Number of People Involved	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to 10	1	(Constant)	1.969	.373		5.277	.000
		Knowledge Management	.222	.189	.118	1.176	.242
More than 10	1	(Constant)	1.527	.604		2.526	.016
		Knowledge Management	.750	.301	.375	2.490	.017
a. Dependent Variable: The schedule of the project was the same as planned							

For respondents with project' number of peopleup to 10, the model is not significant while the model for respondents with number of people of more than 10 to complete their project was significant (p-value= 0.017). This implies that for "number of people involved" project type acts as a moderator between knowledge management and ICT project performance (The schedule of the project was the same as planned). The differences in the relationships depending on project type are shown in the scatter plots below.

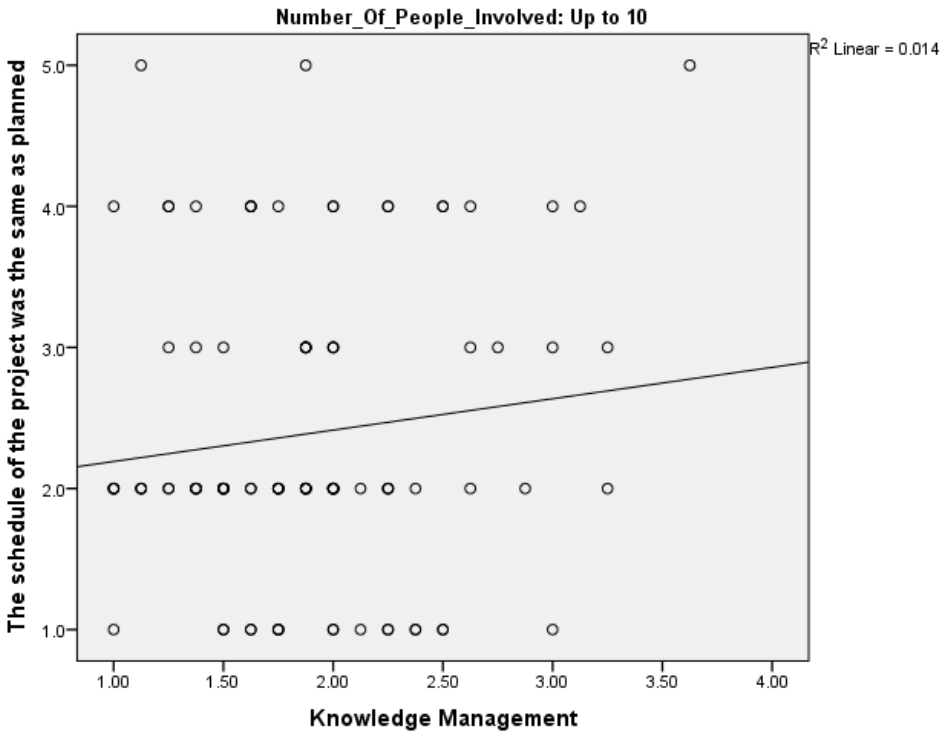


Figure 10A: scatter plots- number of people involved

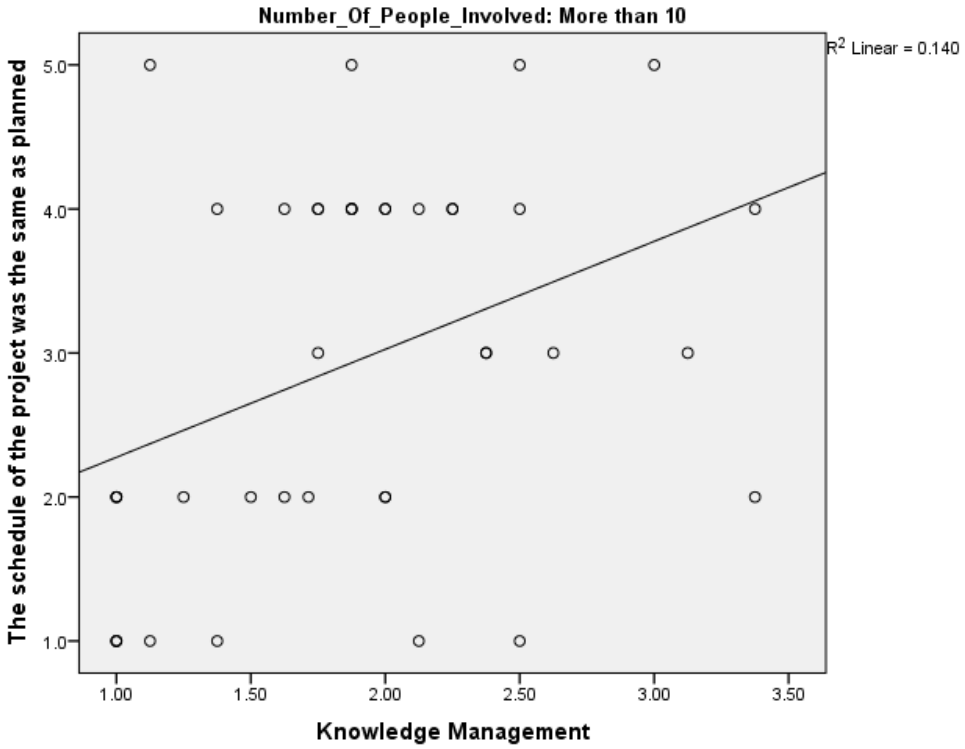


Figure 10B: scatter plots- number of people involved

Industry Sector

Table 87: ANOVA-industry sector as moderator

ANOVA[a]							
Industry sector that the project fall under	Model		Sum of Squares	df	Mean Square	F	Sig.
IT	1	Regression	5.177	1	5.177	3.897	.052[b]
		Residual	99.628	75	1.328		
		Total	104.805	76			
Telecommunication	1	Regression	4.270	1	4.270	3.553	.072[b]
		Residual	28.846	24	1.202		
		Total	33.115	25			
Others/None given	1	Regression	.915	1	.915	.736	.397[b]
		Residual	43.518	35	1.243		
		Total	44.432	36			
a. Dependent Variable: The schedule of the project was the same as planned							
b. Predictors: (Constant), Knowledge Management							

Table 88: Coefficients table- industry sector as moderator

Coefficients[a]							
Industry sector that the project fall under	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
IT	1	(Constant)	1.883	.454		4.149	.000
		Knowledge Management	.465	.236	.222	1.974	.052
Telecommunication	1	(Constant)	1.056	.679		1.556	.133
		Knowledge Management	.642	.341	.359	1.885	.072
Others/None given	1	(Constant)	1.831	.634		2.888	.007
		Knowledge Management	.260	.304	.143	.858	.397
a. Dependent Variable: The schedule of the project was the same as planned							

For respondents within IT, Telecommunication or others, projects up to 6 months the model is not significant .This implies that for " industry sector that the project fall under" project type does not act as a moderator between knowledge management and ICT project performance (The schedule of the project was the same as planned). The differences in the relationships depending on project type are shown in the scatter plots below.

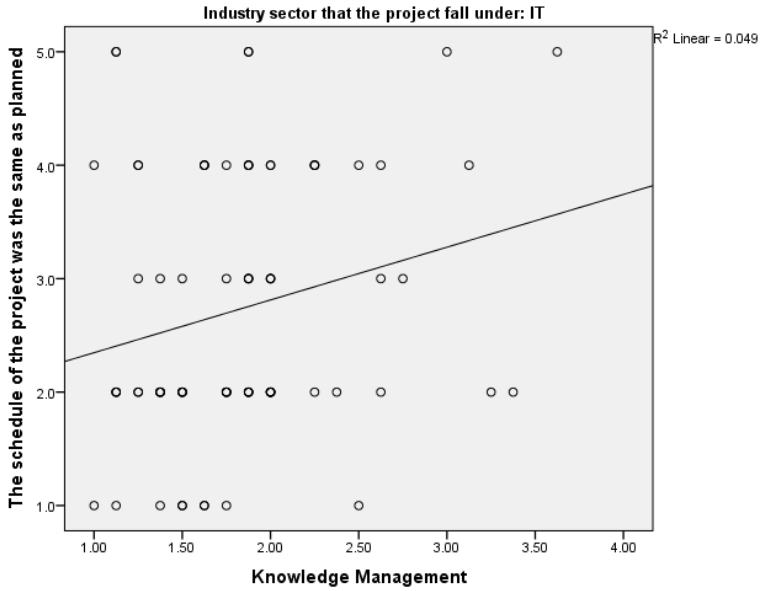


Figure 11A: Scatter plot- industry sector IT

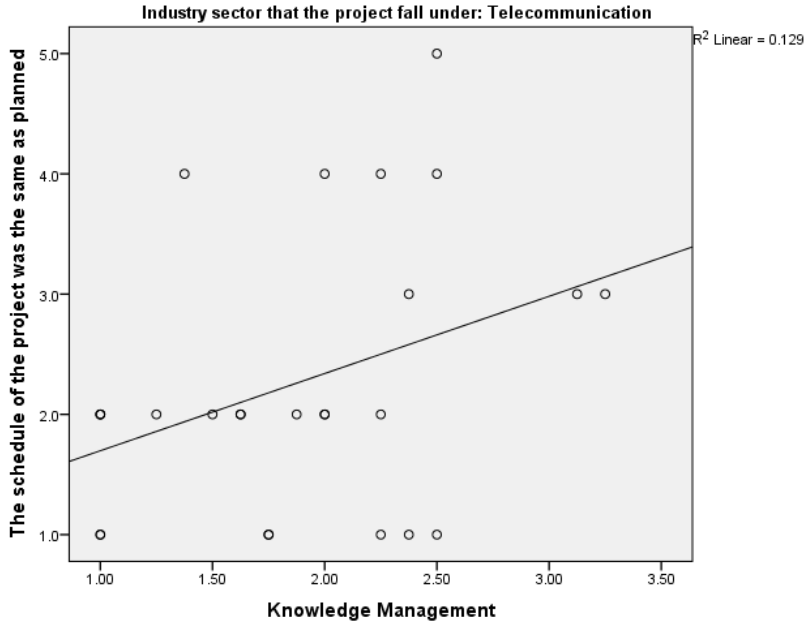


Figure 11B: Scatter plot- industry sector telecommunication

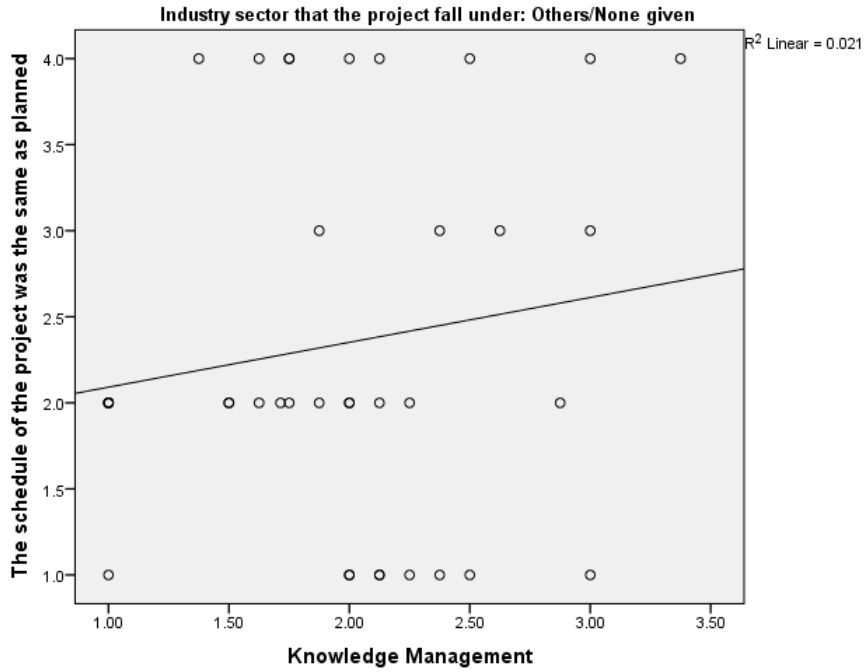


Figure 11C: Scatter plot- industry sector others

Level of Complexity of Project

Table 89: Anova- Level of complexity of project as moderator

ANOVA[a]							
Level of complexity of your project	Model		Sum of Squares	df	Mean Square	F	Sig.
High	1	Regression	10.954	1	10.954	8.284	.005[b]
		Residual	81.984	62	1.322		
		Total	92.938	63			
Medium	1	Regression	.117	1	.117	.099	.754[b]
		Residual	77.941	66	1.181		
		Total	78.059	67			
Low	1	Regression	1.435	1	1.435	.912	.376[b]
		Residual	9.440	6	1.573		
		Total	10.875	7			
a. Dependent Variable: The schedule of the project was the same as planned							
b. Predictors: (Constant), Knowledge Management							

Table 90: Coefficients table- Project level of complexity

Coefficients[a]							
Level of complexity of your project	Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	1.591	.438		3.634	.001
		Knowledge Management	.626	.217	.343	2.878	.005
Medium	1	(Constant)	2.236	.482		4.643	.000
		Knowledge Management	.079	.250	.039	.315	.754
Low	1	(Constant)	-.645	2.933		-.220	.833
		Knowledge Management	1.294	1.355	.363	.955	.376
a. Dependent Variable: The schedule of the project was the same as planned							

For respondents with high level of complexity in their projects the model was significant (p-value= 0.005). This implies that for "level of complexity of your project" project type acts as a moderator between knowledge management and ICT project performance (The schedule of the project was the same as planned). The differences in the relationships depending on project type are shown in the scatter plots below.

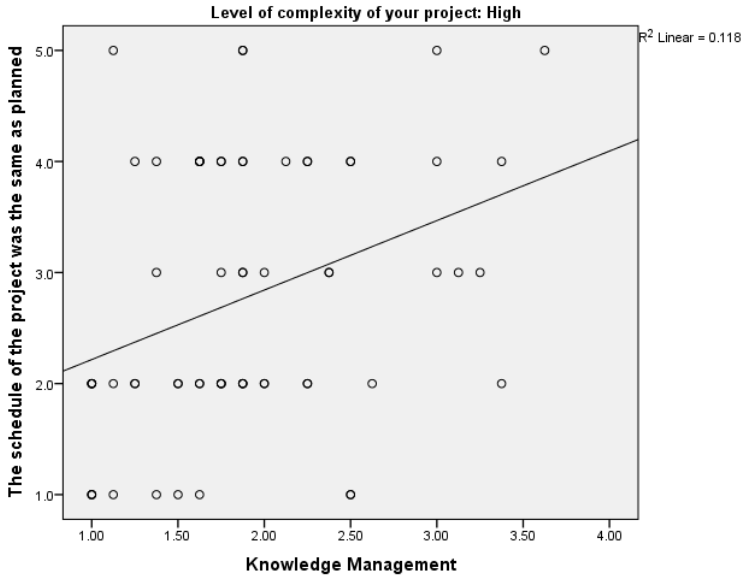


Figure 12 A: Scatter plots- level of complexity high

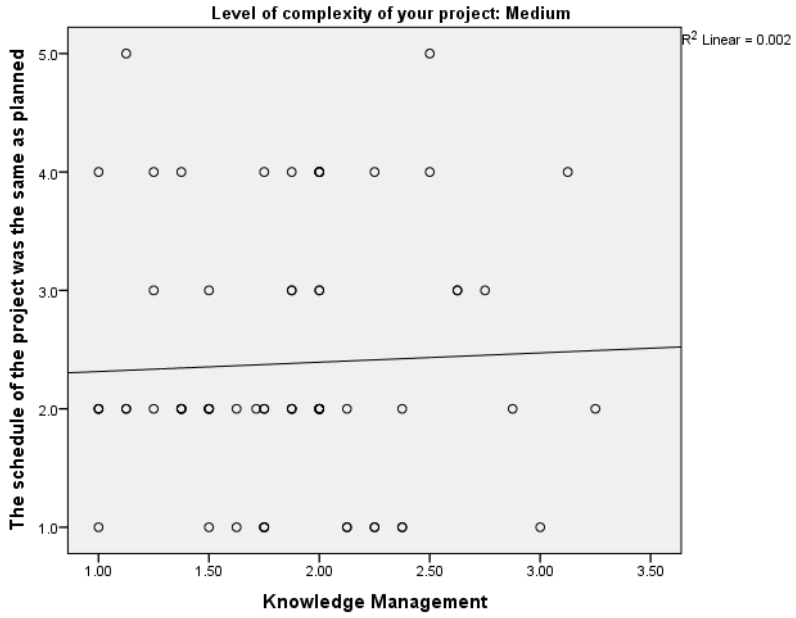


Figure 12 B: scatter plots- level of complexity medium

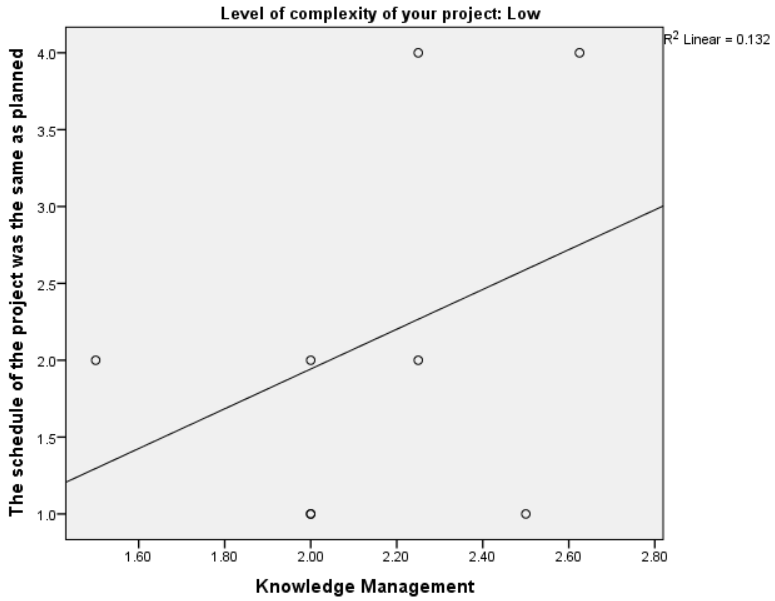


Figure 12 C: Scatter plots- level of complexity low

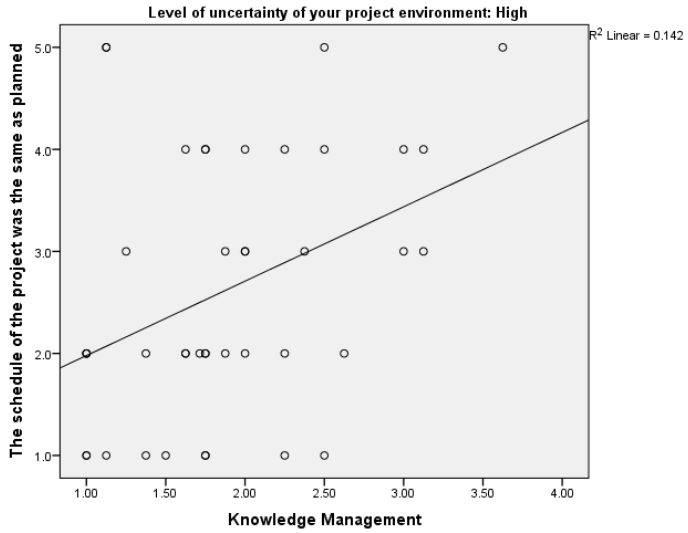
Level of Uncertainty

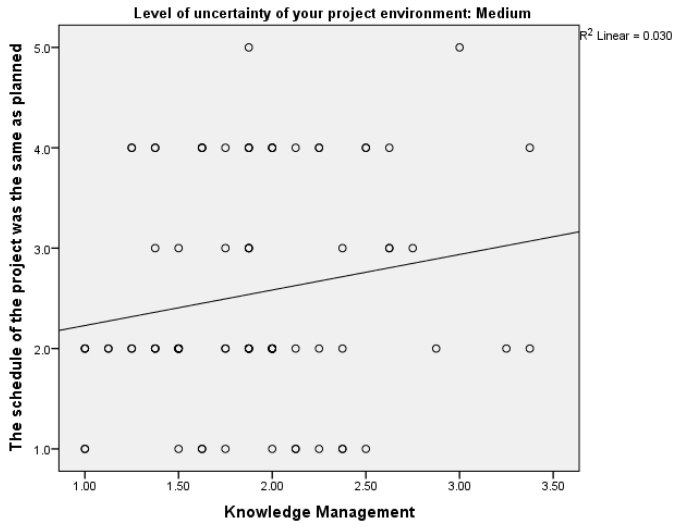
Model Summary					
Level of uncertainty of your project environment	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
High	1	.377[a]	.142	.120	1.2188
Medium	1	.173[a]	.030	.018	1.0977
Low	1	.151[a]	.023	-.047	1.1740
a. Predictors: (Constant), Knowledge Management					

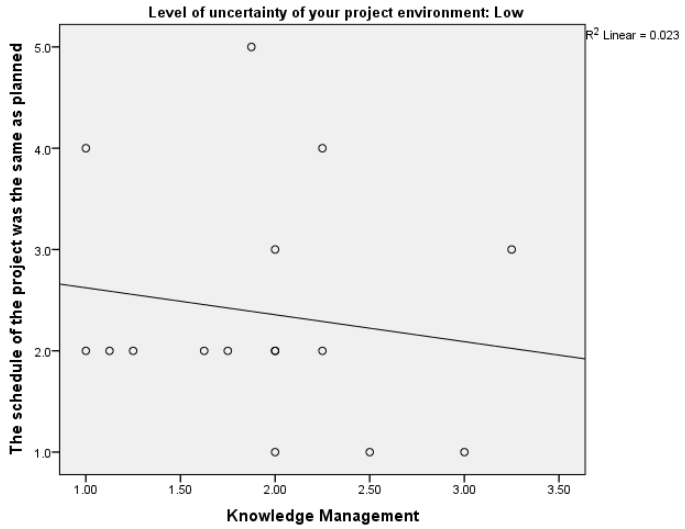
ANOVA[a]							
Level of uncertainty of your project environment	Model		Sum of Squares	df	Mean Square	F	Sig.
High	1	Regression	9.580	1	9.580	6.449	.015[b]
		Residual	57.932	39	1.485		
		Total	67.512	40			
Medium	1	Regression	2.997	1	2.997	2.487	.119[b]
		Residual	97.606	81	1.205		
		Total	100.602	82			
Low	1	Regression	.453	1	.453	.329	.576[b]
		Residual	19.297	14	1.378		
		Total	19.750	15			
a. Dependent Variable: The schedule of the project was the same as planned							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Level of uncertainty of your project environment	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	1.250	.577		2.165	.037
		Knowledge Management	.729	.287	.377	2.540	.015
Medium	1	(Constant)	1.875	.440		4.266	.000
		Knowledge Management	.354	.224	.173	1.577	.119
Low	1	(Constant)	2.888	.942		3.066	.008
		Knowledge Management	-.266	.464	-.151	-.573	.576
a. Dependent Variable: The schedule of the project was the same as planned							

For respondents with high level of uncertainty of the project environment, the model was significant (p-value= 0.015). This implies that for "level of uncertainty" project type acts as a moderator between knowledge management and ICT project performance (The schedule of the project was the same as planned). The differences in the relationships depending on project type are shown in the scatter plots below.







Nature of Project team relationship

Model Summary					
Nature of the project team relationship	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Willingness to cooper	1	.183[a]	.034	.022	1.1515
Medium	1	.254[a]	.064	.046	1.1449
a. Predictors: (Constant), Knowledge Management					

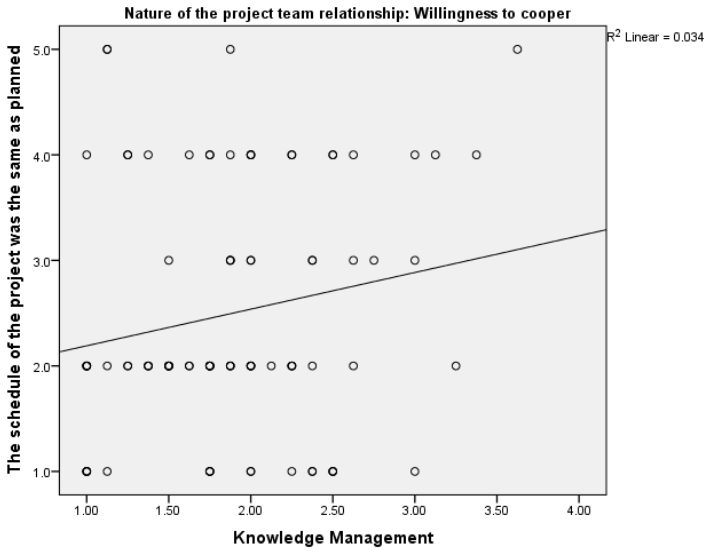
ANOVA[a]							
Nature of the project team relationship	Model		Sum of Squares	df	Mean Square	F	Sig.
Willingness to cooper	1	Regression	3.972	1	3.972	2.996	.087[b]
		Residual	114.028	86	1.326		
		Total	118.000	87			

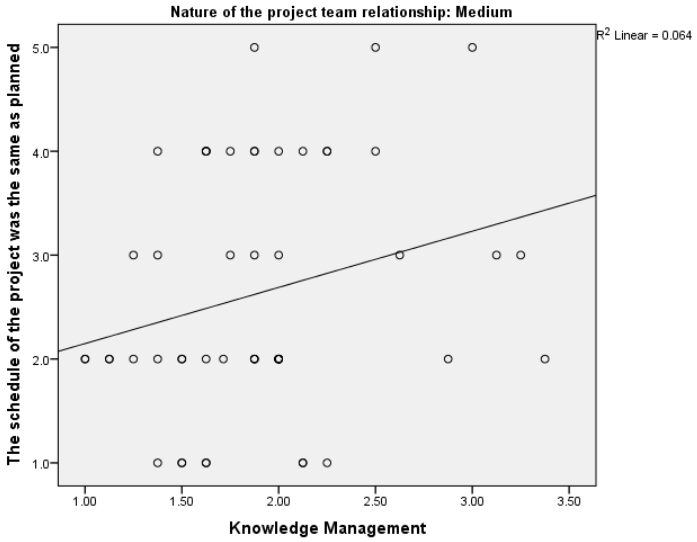
Medium	1	Regression	4.517	1	4.517	3.446	.069[b]
		Residual	65.540	50	1.311		
		Total	70.058	51			
a. Dependent Variable: The schedule of the project was the same as planned							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]

Nature of the project team relationship	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Willingness to cooper	1	(Constant)	1.843	.399		4.623	.000
		Knowledge Management	.347	.201	.183	1.731	.087
Medium	1	(Constant)	1.608	.575		2.795	.007
		Knowledge Management	.541	.291	.254	1.856	.069
a. Dependent Variable: The schedule of the project was the same as planned							

The model for nature of the project team relationship is not significant (p-values= 0.087 and 0.069). This implies that for "nature of the project team relationship" project type does not act as a moderator between knowledge management and ICT project performance (The schedule of the project was the same as planned). The differences in the relationships depending on project type are shown in the scatter plots below.





5.B. Project type is a moderator between knowledge management and ICT project performance (The project was delivered ahead of schedule)

The first model was fitted with Knowledge Management adoption as the independent variable explaining ICT Project performance for the total sample of 140 respondents. The model explained 2.6% of variation in ICT Project performance (The project was delivered ahead of schedule) as shown below.

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.163[a]	.026	.019	1.1533
a. Predictors: (Constant), Knowledge Management				

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.984	1	4.984	3.747	.055[b]
	Residual	183.552	138	1.330		
	Total	188.536	139			
a. Dependent Variable: The project was delivered ahead of schedule						
b. Predictors: (Constant), Knowledge Management						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.071	.329		6.300	.000
	Knowledge Management	.321	.166	.163	1.936	.055
a. Dependent Variable: The project was delivered ahead of schedule						

Time taken to complete your project

Model Summary					
Time taken to complete your project in months	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Up to 6 months	1	.110[a]	.012	-.001	.9971
More than 6 months	1	.447[a]	.199	.186	1.2126
a. Predictors: (Constant), Knowledge Management					

ANOVA[a]							
Time taken to complete your project in months	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to 6 months	1	Regression	.939	1	.939	.944	.334[b]
		Residual	76.555	77	.994		
		Total	77.494	78			
More than 6 months	1	Regression	21.609	1	21.609	14.696	.000[b]
		Residual	86.751	59	1.470		
		Total	108.361	60			
a. Dependent Variable: The project was delivered ahead of schedule							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Time taken to complete your project in months	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to 6 months	1	(Constant)	2.915	.386		7.562	.000
		Knowledge Management	-.186	.191	-.110	-.972	.334
More than 6 months	1	(Constant)	.961	.513		1.873	.066
		Knowledge Management	1.014	.264	.447	3.834	.000
a. Dependent Variable: The project was delivered ahead of schedule							

For respondents with projects of more than 6 months, the model was significant (p-value= 0.000). This implies that for "time taken to complete your project in months" project type acts as a moderator between knowledge management and ICT project performance (The project was delivered ahead of schedule).

Project size as moderator

Model Summary					
Project_size	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Up to R100 000	1	.027[a]	.001	-.011	1.0298
More than R100 000	1	.378[a]	.143	.126	1.2791
a. Predictors: (Constant), Knowledge Management					

ANOVA[a]							
Project_size	Model		Sum of Squares	Df	Mean Square	F	Sig.
Up to R100 000	1	Regression	.064	1	.064	.060	.806[b]
		Residual	91.209	86	1.061		
		Total	91.273	87			
More than R100 000	1	Regression	13.643	1	13.643	8.339	.006[b]
		Residual	81.800	50	1.636		
		Total	95.442	51			
a. Dependent Variable: The project was delivered ahead of schedule							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Project_size	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to R100 000	1	(Constant)	2.687	.406		6.613	.000
		Knowledge Management	-.050	.203	-.027	-.246	.806
More than R100 000	1	(Constant)	1.393	.527		2.642	.011
		Knowledge Management	.780	.270	.378	2.888	.006
a. Dependent Variable: The project was delivered ahead of schedule							

For respondents with projects of more than R100 000, the model was significant (p-value= 0.006). This implies that for "project size" project type acts as a moderator between knowledge management and ICT project performance (The project was delivered ahead of schedule).

Number of people involved in the project as moderator

Model Summary					
Number of People Involved	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Up to 10	1	.044[a]	.002	-.008	1.0775
More than 10	1	.366[a]	.134	.111	1.2844
a. Predictors: (Constant), Knowledge Management					

ANOVA[a]							
Number of People Involved	Model		Sum of Squares	Df	Mean Square	F	Sig.
Up to 10	1	Regression	.223	1	.223	.192	.662[b]
		Residual	113.777	98	1.161		
		Total	114.000	99			
More than 10	1	Regression	9.688	1	9.688	5.873	.020[b]
		Residual	62.687	38	1.650		
		Total	72.375	39			
a. Dependent Variable: The project was delivered ahead of schedule							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Number of People Involved	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to 10	1	(Constant)	2.441	.379		6.437	.000
		Knowledge Management	.084	.192	.044	.439	.662
More than 10	1	(Constant)	1.439	.626		2.299	.027
		Knowledge Management	.756	.312	.366	2.423	.020
a. Dependent Variable: The project was delivered ahead of schedule							

For respondents of projects with number of people of more than 10, the model was significant (p-value= 0.020). This implies that for "number of people involved" project type acts as a moderator between knowledge management and ICT project performance (The project was delivered ahead of schedule).

Industry sector as moderator

Model Summary					
Industry sector that the project fall under	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
IT	1	.240[a]	.057	.045	1.1208
Telecommunication	1	.334[a]	.112	.075	1.1883
Others/None given	1	.024[a]	.001	-.028	1.0916
a. Predictors: (Constant), Knowledge Management					

ANOVA[a]							
Industry sector that the project fall under	Model		Sum of Squares	df	Mean Square	F	Sig.
IT	1	Regression	5.739	1	5.739	4.569	.036[b]
		Residual	94.209	75	1.256		
		Total	99.948	76			
Telecommunication	1	Regression	4.264	1	4.264	3.019	.095[b]
		Residual	33.890	24	1.412		
		Total	38.154	25			
Others/None given	1	Regression	.025	1	.025	.021	.886[b]
		Residual	41.705	35	1.192		
		Total	41.730	36			
a. Dependent Variable: The project was delivered ahead of schedule							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Industry sector that the project fall under	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
IT	1	(Constant)	1.980	.441		4.487	.000
		Knowledge Management	.490	.229	.240	2.138	.036
Telecommunication	1	(Constant)	1.403	.736		1.907	.069
		Knowledge Management	.642	.369	.334	1.738	.095
Others/None given	1	(Constant)	2.383	.621		3.839	.000
		Knowledge Management	-.043	.297	-.024	-.144	.886
a. Dependent Variable: The project was delivered ahead of schedule							

For industry sector, the model was not significant. This implies that this project type doesnot act as a moderator between knowledge management and ICT project performance (The project was delivered ahead of schedule).

Level of complexity of the project as moderator

Model Summary					
Level of complexity of your project	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
High	1	.195[a]	.038	.022	1.2148
Medium	1	.182[a]	.033	.019	1.1211
Low	1	.559[a]	.313	.198	.3166
a. Predictors: (Constant), Knowledge Management					

ANOVA[a]							
Level of complexity of your project	Model		Sum of Squares	df	Mean Square	F	Sig.
High	1	Regression	3.610	1	3.610	2.446	.123[b]
		Residual	91.499	62	1.476		
		Total	95.109	63			
Medium	1	Regression	2.849	1	2.849	2.267	.137[b]
		Residual	82.960	66	1.257		
		Total	85.809	67			
Low	1	Regression	.274	1	.274	2.730	.150[b]
		Residual	.601	6	.100		
		Total	.875	7			
a. Dependent Variable: The project was delivered ahead of schedule							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Level of complexity of your project	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	2.145	.463		4.637	.000
		Knowledge Management	.359	.230	.195	1.564	.123
Medium	1	(Constant)	1.913	.497		3.849	.000
		Knowledge Management	.388	.258	.182	1.506	.137
Low	1	(Constant)	3.084	.740		4.166	.006
		Knowledge Management	-.565	.342	-.559	-1.652	.150
a. Dependent Variable: The project was delivered ahead of schedule							

For the level of complexity of the project, the model was not significant. This indicates that this project type does not act as a moderator between knowledge management and ICT project performance (The project was delivered ahead of schedule).

Level of uncertainty as moderator

Model Summary					
Level of uncertainty of your project environment	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
High	1	.165[a]	.027	.002	1.3405
Medium	1	.218[a]	.047	.036	1.0987
Low	1	.121[a]	.015	-.056	.6988
a. Predictors: (Constant), Knowledge Management					

ANOVA[a]							
Level of uncertainty of your project environment	Model		Sum of Squares	df	Mean Square	F	Sig.
High	1	Regression	1.968	1	1.968	1.095	.302[b]
		Residual	70.081	39	1.797		
		Total	72.049	40			
Medium	1	Regression	4.871	1	4.871	4.035	.048[b]
		Residual	97.780	81	1.207		
		Total	102.651	82			
Low	1	Regression	.101	1	.101	.207	.656[b]
		Residual	6.836	14	.488		
		Total	6.937	15			
a. Dependent Variable: The project was delivered ahead of schedule							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Level of uncertainty of your project environment	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	2.104	.635		3.314	.002
		Knowledge Management	.330	.316	.165	1.047	.302
Medium	1	(Constant)	1.921	.440		4.366	.000
		Knowledge Management	.451	.225	.218	2.009	.048
Low	1	(Constant)	2.305	.561		4.111	.001
		Knowledge Management	-.126	.276	-.121	-.455	.656
a. Dependent Variable: The project was delivered ahead of schedule							

For respondents with medium level of uncertainty of their projects, the model was significant (p-value= 0.048). This suggests that for "level of uncertainty of the project environment" project type acts as a moderator between knowledge management and ICT project performance (The project was delivered ahead of schedule).

Nature of the project team relationship as a moderator

Model Summary					
Nature of the project team relationship	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
Willingness to cooper	1	.125[a]	.016	.004	1.1020
Medium	1	.229[a]	.052	.033	1.2485
a. Predictors: (Constant), Knowledge Management					

ANOVA[a]							
Nature of the project team relationship	Model		Sum of Squares	df	Mean Square	F	Sig.
Willingness to cooper	1	Regression	1.645	1	1.645	1.354	.248[b]
		Residual	104.435	86	1.214		
		Total	106.080	87			
Medium	1	Regression	4.297	1	4.297	2.757	.103[b]
		Residual	77.933	50	1.559		
		Total	82.231	51			
a. Dependent Variable: The project was delivered ahead of schedule							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Nature of the project team relationship	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Willingness to cooper	1	(Constant)	2.225	.382		5.831	.000
		Knowledge Management	.223	.192	.125	1.164	.248
Medium	1	(Constant)	1.730	.627		2.757	.008
		Knowledge Management	.527	.318	.229	1.660	.103
a. Dependent Variable: The project was delivered ahead of schedule							

The table above implies that for " the nature of the project team relationship" project type does not act as a moderator between knowledge management and ICT project performance (The project was delivered ahead of schedule).

5.4.6 Association between biographical factors and ICT Project Performance

5.4.6.1 ICT project performance- the schedule of the project was the same as planned

Is there a relationship between Job Title and ICT Project Performance?

One way analysis of variance for Job Title and ICT Project performance.

Descriptives							
The schedule of the project was the same as planned							
	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
Project manager (Junior and Senior)	38	2.763	1.2178	2.363	3.163	1	5
It support/Technical	9	2.444	.8819	1.767	3.122	1	5
System/software developer	35	2.771	1.1137	2.389	3.154	1	5
Program manager	4	1.250	.5000	.454	2.046	1	5
Data/Business /system Analyst	16	2.688	1.2500	2.021	3.354	1	5
Consultant/sales	32	2.156	1.0506	1.777	2.535	1	5
Others	6	2.667	1.5055	1.087	4.247	1	5
Total	140	2.550	1.1650	2.355	2.745	1	5

ANOVA					
The schedule of the project was the same as planned					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	15.648	6	2.608	2.005	.069
Within Groups	173.002	133	1.301		
Total	188.650	139			

Relationship is not significant at 5% significance level since the p-value of the one-way analysis of variance (p-value = 0.069) is greater than 0.05.

Is there a relationship between Level of education and ICT Project performance?

One way analysis of variance for Highest Level of education and ICT Project performance.

Descriptives							
The schedule of the project was the same as planned							
	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
National Diploma	24	2.792	1.3507	2.221	3.362	1	5
Bachelor	50	2.460	1.0343	2.166	2.754	1	5
Honours/Post grad diploma	31	2.581	1.1188	2.170	2.991	1	4
Masters	33	2.455	1.2770	2.002	2.907	1	5
PHD	2	3.000	1.4142	-9.706	15.706	2	4
Total	140	2.550	1.1650	2.355	2.745	1	5

ANOVA					
The schedule of the project was the same as planned					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.541	4	.635	.461	.764
Within Groups	186.109	135	1.379		
Total	188.650	139			

Relationship not significant at 5% significance level since the p-value of the one-way analysis of variance (p-value = 0.764) is greater than 0.05. Therefore there is no association between level of education and ICT proect performance.

Is there a relationship between Company Type and ICT Project Performance?

One way analysis of variance for Company Type and ICT Project performance

Descriptives							
The schedule of the project was the same as planned							
	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
Public	11	2.364	.9244	1.743	2.985	1	4
Private	104	2.606	1.1776	2.377	2.835	1	5
Governmental	19	2.316	1.1572	1.758	2.874	1	5
Non-profit	6	2.667	1.5055	1.087	4.247	1	4
Total	140	2.550	1.1650	2.355	2.745	1	5

ANOVA					
The schedule of the project was the same as planned					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.829	3	.610	.444	.722
Within Groups	186.821	136	1.374		
Total	188.650	139			

Relationship is not significant at 5% significance level since the p-value of the one-way analysis of variance (p-value = 0.722) is greater than 0.05. Thus, there is no relationship betweeen company type and ICT project performance.

Is there a relationship between Industry and ICT Project Performance?

One way analysis of variance for Industry and ICT Project performance

Descriptives							
The schedule of the project was the same as planned							
	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
IT	58	2.776	1.1853	2.464	3.088	1	5
Telecommunication	18	2.333	1.1376	1.768	2.899	1	5
Banking	32	2.531	1.0468	2.154	2.909	1	5
Insurance	2	1.500	.7071	-4.853	7.853	1	2
Other	30	2.333	1.2411	1.870	2.797	1	5
Total	140	2.550	1.1650	2.355	2.745	1.0	5.0

ANOVA					
The schedule of the project was the same as planned					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.428	4	1.857	1.383	.243
Within Groups	181.222	135	1.342		
Total	188.650	139			

Relationship is not significant at 5% significance level since the p-value of the one-way analysis of variance (p-value = 0.243) is greater than 0.05.

5.4.6.2 ICT project performance- the project was ahead of schedule

Is there a relationship between Job title and ICT Project Performance?

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
Project manager (Junior and Senior)	38	2.737	1.1783	2.350	3.124	1.0	5.0
It support/Technical	9	2.667	.7071	2.123	3.210	2.0	4.0
System/software developer	35	2.771	1.1903	2.363	3.180	1.0	5.0
Program manager	4	1.500	1.0000	-.091	3.091	1.0	3.0
Data/Business /system Analyst	16	2.938	.9287	2.443	3.432	2.0	5.0
Consultant/sales	32	2.406	1.1876	1.978	2.834	1.0	5.0
Others	6	3.333	1.6330	1.620	5.047	1.0	5.0
Total	140	2.679	1.1646	2.484	2.873	1.0	5.0

ANOVA

The project was delivered ahead of schedule

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.006	6	2.001	1.508	.180
Within Groups	176.529	133	1.327		
Total	188.536	139			

Relationship is not significant at 5% significance level since the p-value of the one-way analysis of variance (p-value = 0.180) is greater than 0.05. Thus there is no association between jo title and ICT project performance.

Is there a relationship between Education level and ICT Project Performance?

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
National Diploma	24	3.125	1.0347	2.688	3.562	2.0	5.0
Bachelor	50	2.800	1.1606	2.470	3.130	1.0	5.0
Honours/Post grad diploma	31	2.323	1.2751	1.855	2.790	1.0	5.0
Masters	33	2.455	1.0633	2.078	2.832	1.0	4.0
PHD	2	3.500	.7071	-2.853	9.853	3.0	4.0
Total	140	2.679	1.1646	2.484	2.873	1.0	5.0

ANOVA

The project was delivered ahead of schedule

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	12.455	4	3.114	2.387	.054
Within Groups	176.081	135	1.304		
Total	188.536	139			

The relationship is not significant at 5% significance level since the p-value of the one-way analysis of variance (p-value = 0.054) is greater than 0.05. So there is no link between level of education and ICT project performance.

Is there a relationship between Company type and ICT Project Performance?

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
Public	11	1.727	.6467	1.293	2.162	1.0	3.0
Private	104	2.740	1.1741	2.512	2.969	1.0	5.0
Governmental	19	2.895	1.1496	2.341	3.449	1.0	5.0
Non-profit	6	2.667	1.2111	1.396	3.938	1.0	4.0
Total	140	2.679	1.1646	2.484	2.873	1.0	5.0

ANOVA					
The project was delivered ahead of schedule					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11.241	3	3.747	2.874	.039
Within Groups	177.295	136	1.304		
Total	188.536	139			

The relationship is significant at 5% significance level since the p-value of the one-way analysis of variance (p-value = 0.039) is less than 0.05. Therefore company type is related to ICT project performance (the project was delivered ahead of schedule).

Is there a relationship between Industry sector and ICT Project Performance?

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
IT	58	2.948	1.1909	2.635	3.261	1	5
Telecommunication	18	2.389	1.1950	1.795	2.983	1	5
Banking	32	2.688	1.0906	2.294	3.081	1	5
Insurance	2	1.500	.7071	-4.853	7.853	1	5
Other	30	2.400	1.1017	1.989	2.811	1	5
Total	140	2.679	1.1646	2.484	2.873	1	5

ANOVA					
The project was delivered ahead of schedule					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.838	4	2.710	2.058	.090
Within Groups	177.698	135	1.316		
Total	188.536	139			

The relationship is not significant at 5% significance level since the p-value of the one-way analysis of variance (p-value = 0.09) is greater than 0.05.

Further results can be found in Appendix 8.

5.5 RESPONSE BIAS TESTING

Independent samples t-test was conducted to assess whether there was non-response bias by comparing the average rating for the first 70 respondents to the ratings of the last 70 responses.

Table : T-Test between early respondents (the First 70) and late respondents (Last 70 Responses)

Group Statistics					Independent Samples Test	
Time		N	Mean	Std. Deviation	t	P-value
Synchronous communication tools :live chat– Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM	First 70	70	1.80	0.926	-0.291	0.771
	Last 70	70	1.84	0.810		
Asynchronous communication tools :Email, Intranet, enterprise software applications	First 70	70	1.26	0.502	-1.054	0.294
	Last 70	70	1.36	0.615		
Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.	First 70	70	2.00	0.933	1.459	0.147
	Last 70	69	1.78	0.820		
Face-to-face interaction	First 70	70	1.414	0.712	-0.583	0.561
	Last 70	70	1.486	0.737		
Telephone	First 70	70	1.671	0.793	1.533	0.128
	Last 70	70	1.486	0.631		
Hand written report	First 70	70	2.557	0.942	0.980	0.329
	Last 70	70	2.400	0.954		
The schedule of the project was the same as planned	First 70	70	2.871	1.227	3.385	0.001
	Last 70	70	2.229	1.010		

The project was delivered ahead of schedule	First 70	70	3.029	1.239	3.716	0.000
	Last 70	70	2.329	0.974		
The project did not have a budget overrun	First 70	70	3.400	1.109	-1.655	0.100
	Last 70	70	3.686	0.925		
The cost objective were met for the project	First 70	70	2.414	1.042	0.814	0.417
	Last 70	70	2.271	1.034		
The project produced a high quality solution/service	First 70	70	1.914	0.775	-0.901	0.369
	Last 70	70	2.043	0.908		
The project deliverables complied with the contractual requirements	First 70	70	1.829	0.761	-1.391	0.167
	Last 70	70	2.029	0.932		
Knowledge Management	First 70	70	1.9929	0.624	2.014	0.046
	Last 70	70	1.7941	0.540		

Only three variables showed a difference in rating between the first 70 respondents against the last 70 respondents. The variables were knowledge management, the schedule of the project was the same as planned and the project was delivered ahead of schedule. Thus reponse bias was not considered problematic in this study.

5.6 CONCLUSION

This chapter presented the findings of the study and all the statistical analyses used to measure the different hypotheses of the model. The following chapter discusses the significance of the findings linked to the literature.

CHAPTER 6: DISCUSSION OF THE FINDINGS

6. DISCUSSION OF THE FINDINGS

6.1 INTRODUCTION

In this chapter the combined findings of the quantitative and qualitative analyses are discussed. This chapter expands the study from a reporting of the results to a discussion of the results. The qualitative analysis, based on a grounded application which imposed no theoretical structure, was discussed in Chapter four. In Chapter five, the results of the statistical testing were reported. Univariate, bivariate and multivariate results were reported. In this chapter the results are all discussed. The discussion proceeds as follows.

6.2 HYPOTHESIS A: THERE IS A SIGNIFICANT ASSOCIATION BETWEEN SOCIAL MEDIA USAGE AND PROJECT PERFORMANCE

The direct impact from social media usage to project performance was found to be not significant (p-value = 0.725> 0.05). Therefore Ha was not supported. This result contests the prediction of social media tools usage affecting the processes involved with information services supporting project management (Remidez & Jones, 2012; Pinkowski & Lent, 2011). Further studies, like Shettini & Weiss (2011) provided statistical reports indicating project manager's view on the critical role of social media for their industry.

6.3 HYPOTHESIS B: THERE IS A SIGNIFICANT ASSOCIATION BETWEEN SOCIAL MEDIA USAGE AND KNOWLEDGE MANAGEMENT PRACTICE

Social media usage was found to not be significantly associated with knowledge management practice. The null hypothesis was accepted and the the association was found to not be significant. According to the qualitative analysis findings, this result is surprising because collaborative tools that are typically associated with social media usage were expected to be associated with higher levels of knowledge sharing. Several studies suggested a possible link between social media through ICTs and knowledge sharing (Reed & Knight, 2013; Shettini & Weiss, 2011). However, a tension exists, in the literature, between the content and the relational perspectives. The latter underlines a negative influence of social media on knowledge management outcomes (Smith and Lyles: 2006). Steyn et al (2012) supported this

last view by mentioning that a huge amount of information and knowledge is more communicated via softer channers than harder ones.

6.4 HYPOTHESIS C: THERE IS A SIGNIFICANT ASSOCIATION BETWEEN KNOWLEDGE MANAGEMENT PRACTICE AND PROJECT PERFORMANCE

The association between knowledge management practice and project performance was found to be significant. It is suggested that these results support the argument of Defillipi et al (2006) that knowledge gained from past projects can be reused to contribute to successive projects. Sattar (2012) also suggested that organisations focusing on KM sharing among all divisions were more successful than those who shared smaller amount. Additionally qualitative findings confirm that knowledge management is a key factor influencing project performance-especially in the ICT industry.

6.5 HYPOTHESIS D: MEDIATING EFFECT OF KNOWLEDGE MANAGEMENT ADOPTION

The mediating role of knowledge management adoption in the relationship between social media usage and project performance was examined by investigating changes in beta coefficients and R-squared when entering KM variable in a series of regression models. Results indicated that higher level of social media tools usage was associated with higher level of project performance only on the cost component of project performance. Two models were tested to evaluate the interaction effect of knowledge management. With the addition of knowledge management adoption in the second model; social media usage was no longer significant in explaining variance in project performance. Knowledge management was found to mediate the relationship between social media usage and project cost performance. This result is in line with the proposition of Defillippi, Arthur & Lindsay (2006) suggesting a possible connection between these variables. Further past studies suggested approaches of knowledge management as a mediator in the relationship between social media usage and project performance. Murphya & Salomoneb (2013) added that many companies used social media as an emerging mean for knowledge sharing. Past project knowledge can be retrieved

using interactive applications (Smith & Lyles, 2006). However, critics of the relational perspective of knowledge management does not support this proposition as it was stated that knowledge exchange through ICTs is not associated with the use of KM applications within projects (Smith & Lyles, 2006).

6.6 HYPOTHESIS E: MODERATING EFFECT OF PROJECT TYPE

The variable project was categorised according to seven project types. Project types were measured by using these attributes. Each of the 7 project type variables was tested individually to find out whether they moderate the relationship between knowledge management and ICT project performance. Findings indicate that project time of completion for more than six months, project cost for more than R100 000, team size for more than 10 people, high level of complexity, company type and project environment- all have a moderating influence on the relationship between knowledge management and project performance. Past studies confirm this finding as it was suggested that uncertainty was a stressor experienced by project managers that could hinder their performance (Haynes & Love, 2004; Gelbart & Carmeli, 2009). Toyo (2009) emphasized this by reviewing the traditional definition of projects that state a successful project as one finished on time and within budget. Large project teams are more likely to attain project performance when they experience high level of knowledge management adoption. However no significant interaction was found for industry sector and team willing to cooperate. The qualitative findings conflicts this last finding in suggesting that the team willing to cooperate, experiences higher level of knowledge sharing.

6.7 CONCLUSION

This chapter presented a discussion of the results of the quantitative analysis of the research. The quantitative results were related to the qualitative findings and the multivariate results were discussed in relation to each of the tested hypotheses. A detailed synopsis of the research, its conclusions, and recommendations for practice and further research is now provided in the final chapter, which follows.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7 CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

In this chapter, the research is concluded with a summary of the research, of its objectives, and of the findings. Recommendations are made for practice and further research.

7.2 CONCLUSION

The purpose of this study was to develop a model relating the use of social media and the adoption of knowledge sharing and application to the success of ICT projects and to test this model quantitatively. From this core objective, the following four specific sub-objectives were derived:

- To investigate the extent to which social media usage is related to ICT project success.
- To investigate the extent to which knowledge management is associated with ICT project success.
- To analyse the interaction effects between knowledge management practice and the relationship between social media usage and ICT project success.
- Lastly, to analyse the interaction effects between project type and the relationship between knowledge management and ICT project success.

The core research question addressed in this research was the following: "*What is the relationship between social media technologies usage, knowledge management practice and ICT project performance?"*

From this core research question, the following five specific sub-ordinate research questions were derived, and hypotheses were, in turn, derived from these sub-ordinate research questions:

- *1. What is the relationship between social media usage and ICT project performance?*
- *2. What is the relationship between social media usage and knowledge management practice?*
- *3. What is the relationship between knowledge management adoption and ICT project performance?*

- *4. What is the interaction effect between knowledge management and the relationship social media-ICT project performance?*
- *5. What is the interaction effect between project type and the relationship knowledge management-ICT project performance?*

All hypotheses predicted an association between all the independent variables with ICT project performance. Nevertheless, in response to the first research question, the results revealed no relationship between social media usage and ICT project performance. This finding contrasted the suggestions made in the large literature dealing with social media and project performance. The qualitative analysis found that performance related to ICT project is enhanced when dealing with communication or collaborative tools. The quantitative findings were found not to support the qualitative findings.

Again, no association was found between all social media variables and knowledge management practice. Yet, the qualitative findings highlighted that collaborative tools enable knowledge sharing among project team members. This finding was also confirmed in the literature by (Murphya & Salomoneb, 2013). However the quantitative findings did not support previous studies.

On the basis of the theory that was found to be supported by the quantitative results, and also on the basis of the qualitative findings, it was concluded that knowledge management practice was positively associated with ICT project performance. It is argued that these results support the argument that knowledge sharing and knowledge gained from past projects can be reused and contribute to the success of projects (Defillippi, Arthur, & Lindsay, 2006).

An interesting finding would be the mediating role of knowledge management practice into the relationship between social media usage and ICT project performance with the cost component. This finding supported the very few studies done on the effect of knowledge management adoption on technologies tools usage and project performance.

Finally, the results of the effects of project type on the relationship between knowledge management adoption and ICT project performance answered research question five. Regarding the moderating effect of project team size, this result was supported in the literature by Gelbart and Carmeli (2009) who suggested that ICT projects are made of an

important team based composition. Additionally, Mckay et al (2013) reported that technological and organizational complexity and volatile environment increased the need for best practice project management in challenging contexts. Of all project type variables, industry sector and team willingness to cooperate did not moderate the relationship between knowledge management practice and project performance.

7.3 RECOMMENDATION FOR FUTURE RESEARCH

In summary, this research presents empirical evidence that supports the expectation of gaining significant benefits with higher levels of knowledge management practice adoption. Findings from this study provide direction for enhancing knowledge management and are helpful to managers in deciding whether to adopt KM practice on different types of projects. One limitation of this study is the cross sectional design. An objective for future study is to determine how social media usage and KM practice adoption are changing over time. Survey with a longitudinal design may be needed to gain deeper insights into the nature of the relationships. Furthermore, the sample for this study focuses on projects in the ICT industry. Consideration should be given to investigate the associations in other industries. Finally low reliability of the project performance measure might have impacted on the results of this study. Therefore, it would be interesting to develop an improved scale to measure project performance with regard to specific factors involved in the ICT industry. This could also lead to greater insights into the relationships among social media tools application, KM practice adoption, and project success.

APPENDIXES AND REFERENCES

8. APPENDIX

8.1 QUALITATIVE CODING

Table A: Project performance Qualitative codes-social media codes at the individual level

Themes	**Codes**
Communication tools	SMCOM
Collaborative tools	SMCOL
Non computer mediatedtools	SMNCOM

Table B: Project performance Qualitative codes-Knowledge Management codes at the individual level

Themes	**Codes**
Knowledge Sharing	KMSH
Knowledge reuse	KMRE

Table C: Project performance Qualitative codes- Individual level

Themes	**Codes**
Work experience of PM	PPEXP
International exposure	PPINT
Industry sector	PPIS

Table D: Project performance Qualitative codes- Project level

Themes	**Codes**
Project cost	PPCST
Project functionality	PPFUNC
Time	PPT
Team size	PPTS
Constraints	PPCONST

8.2 QUALITATIVE RESEARCH INTERVIEW QUESTIONS

1. How many years of experience do you have in IT project management?

2. Can you think of an IT project where you used a social media tool during the course of the project? Please explain the project; describe what specific tool it was and the purpose of this tool? Has the result been positive or negative in terms of the project outcome?

3. In the above project, did you try to recall past experiences from projects; did you consult other people for advice? If so, did that person share his experience with you? How? Has the result been positive or negative (from consulting others/sharing experiences)?

4. Have you ever shared a project experience with any other colleagues inside or outside the company? How or in what format was it done? /Why not?

5. Are there any other things related to your experience in using social media or sharing knowledge in an IT project that you would care to share?

Thank you for your time. Your input is most appreciated!

8.3 FURTHER REPORTING OF STATISTICAL RESULTS: HYPOTHESIS 5: PROJECT TYPE ACTS AS A MODERATOR

5.C Project type is a moderator between knowledge management and ICT project performance (The project did not have a budget overrun)

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.925	1	3.925	3.793	.054[b]
	Residual	142.818	138	1.035		
	Total	146.743	139			
a. Dependent Variable: The project did not have a budget overrun						
b. Predictors: (Constant), Knowledge Management						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.082	.290		14.078	.000
	Knowledge Management	-.285	.146	-.164	-1.947	.054
a. Dependent Variable: The project did not have a budget overrun						

Completion Time as Moderator

ANOVA[a]							
Time taken to complete your project in months	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to 6 months	1	Regression	2.480	1	2.480	2.785	.099[b]
		Residual	68.558	77	.890		
		Total	71.038	78			
More than 6 months	1	Regression	1.652	1	1.652	1.325	.254[b]
		Residual	73.561	59	1.247		
		Total	75.213	60			
a. Dependent Variable: The project did not have a budget overrun							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Time taken to complete your project in months	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to 6 months	1	(Constant)	4.177	.365		11.450	.000
		Knowledge Management	-.302	.181	-.187	-1.669	.099
More than 6 months	1	(Constant)	3.994	.473		8.452	.000
		Knowledge Management	-.280	.243	-.148	-1.151	.254
a. Dependent Variable: The project did not have a budget overrun							

Project size as Moderator

ANOVA[a]							
Project_size	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to R100 000	1	Regression	1.074	1	1.074	1.175	.281[b]
		Residual	78.641	86	.914		
		Total	79.716	87			
More than R100 000	1	Regression	3.323	1	3.323	2.610	.112[b]
		Residual	63.657	50	1.273		
		Total	66.981	51			
a. Dependent Variable: The project did not have a budget overrun							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Project_size	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to R100 000	1	(Constant)	3.951	.377		10.471	.000
		Knowledge Management	-.204	.189	-.116	-1.084	.281
More than R100 000	1	(Constant)	4.227	.465		9.088	.000
		Knowledge Management	-.385	.238	-.223	-1.616	.112
a. Dependent Variable: The project did not have a budget overrun							

Team size as Moderator

ANOVA[a]							
Number of People Involved	Model		Sum of Squares	Df	Mean Square	F	Sig.
Up to 10	1	Regression	.180	1	.180	.182	.670[b]
		Residual	96.660	98	.986		
		Total	96.840	99			
More than 10	1	Regression	7.672	1	7.672	6.904	.012[b]
		Residual	42.228	38	1.111		
		Total	49.900	39			
a. Dependent Variable: The project did not have a budget overrun							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Number of People Involved	Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
			B	Std. Error	Beta		
Up to 10	1	(Constant)	3.683	.349		10.539	.000
		Knowledge Management	-.076	.177	-.043	-.427	.670
More than 10	1	(Constant)	4.827	.514		9.393	.000
		Knowledge Management	-.673	.256	-.392	-2.627	.012
a. Dependent Variable: The project did not have a budget overrun							

Industry sector as Moderator

ANOVA[a]							
Industry sector that the project fall under	Model		Sum of Squares	df	Mean Square	F	Sig.
IT	1	Regression	2.662	1	2.662	2.026	.159[b]
		Residual	98.559	75	1.314		
		Total	101.221	76			
Telecommunication	1	Regression	5.608	1	5.608	9.428	.005[b]
		Residual	14.276	24	.595		
		Total	19.885	25			
Others/None given	1	Regression	.145	1	.145	.204	.654[b]
		Residual	24.774	35	.708		
		Total	24.919	36			
a. Dependent Variable: The project did not have a budget overrun							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Industry sector that the project fall under	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
IT	1	(Constant)	4.095	.451		9.074	.000
		Knowledge Management	-.333	.234	-.162	-1.423	.159
Telecommunication	1	(Constant)	5.044	.477		10.565	.000
		Knowledge Management	-.736	.240	-.531	-3.070	.005
Others/None given	1	(Constant)	3.388	.478		7.082	.000
		Knowledge Management	.104	.229	.076	.452	.654
a. Dependent Variable: The project did not have a budget overrun							

Nature of the project team relationship as a Moderator

ANOVA[a]							
Nature of the project team relationship	Model		Sum of Squares	df	Mean Square	F	Sig.
Willingness to cooper	1	Regression	.270	1	.270	.278	.599[b]
		Residual	83.627	86	.972		
		Total	83.898	87			
Medium	1	Regression	7.552	1	7.552	6.832	.012[b]
		Residual	55.275	50	1.105		
		Total	62.827	51			
a. Dependent Variable: The project did not have a budget overrun							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Nature of the project team relationship	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Willingness to cooper	1	(Constant)	3.705	.341		10.852	.000
		Knowledge Management	-.091	.172	-.057	-.527	.599
Medium	1	(Constant)	4.885	.528		9.246	.000
		Knowledge Management	-.699	.267	-.347	-2.614	.012
a. Dependent Variable: The project did not have a budget overrun							

Is there a relationship between job description and ICT project performance- the project did not have a budget overru

ANOVA					
The project did not have a budget overrun					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.871	6	.479	.442	.849
Within Groups	143.872	133	1.082		
Total	146.743	139			

Is there a relationship between level of education and ICT project performance- the project did not have budget overru

ANOVA					
The project did not have a budget overrun					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.493	4	1.123	1.066	.376
Within Groups	142.250	135	1.054		
Total	146.743	139			

Is there a relationship between company type and ICT project performance- The project did not have a budget overru

ANOVA					
The project did not have a budget overrun					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.704	3	.235	.218	.883
Within Groups	146.039	136	1.074		
Total	146.743	139			

Is there a relationship between industry sector and ICT project performance- the project did not have budget overrun

ANOVA					
The project did not have a budget overrun					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.221	4	.305	.283	.888
Within Groups	145.522	135	1.078		
Total	146.743	139			

5.D. Project type is a moderator between knowledge management and ICT project performance (The cost objective were met for the project)

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11.006	1	11.006	10.964	.001[b]
	Residual	138.537	138	1.004		
	Total	149.543	139			
a. Dependent Variable: The cost objective were met for the project						
b. Predictors: (Constant), Knowledge Management						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.440	.286		5.041	.000
	Knowledge Management	.477	.144	.271	3.311	.001
a. Dependent Variable: The cost objective were met for the project						

Is there a relationship between project time and ICT project performance- the cost objectives were met for the project

ANOVA[a]							
Time taken to complete your project in months	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to 6 months	1	Regression	2.818	1	2.818	2.981	.088[b]
		Residual	72.777	77	.945		
		Total	75.595	78			
More than 6 months	1	Regression	8.847	1	8.847	8.313	.005[b]
		Residual	62.792	59	1.064		
		Total	71.639	60			
a. Dependent Variable: The cost objectives were met for the project							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Time taken to complete your project in months	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to 6 months	1	(Constant)	1.835	.376		4.881	.000
		Knowledge Management	.322	.187	.193	1.727	.088
More than 6 months	1	(Constant)	.997	.437		2.284	.026
		Knowledge Management	.649	.225	.351	2.883	.005
a. Dependent Variable: The cost objective were met for the project							

Is there a relationship between project size and ICT project performance- the cost objective were met for the project

ANOVA[a]							
Project_size	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to R100 000	1	Regression	3.651	1	3.651	3.877	.052[b]
		Residual	80.974	86	.942		
		Total	84.625	87			
More than R100 000	1	Regression	7.700	1	7.700	6.758	.012[b]
		Residual	56.973	50	1.139		
		Total	64.673	51			
a. Dependent Variable: The cost objective were met for the project							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Project Size	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to R100 000	1	(Constant)	1.649	.383		4.307	.000
		Knowledge Management	.377	.191	.208	1.969	.052
More than R100 000	1	(Constant)	1.211	.440		2.753	.008
		Knowledge Management	.586	.225	.345	2.600	.012
a. Dependent Variable: The cost objective were met for the project							

Is there a relationship between team size and ICT project performance- the cost objetives were met for the project

ANOVA[a]							
Number of People Involved	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to 10	1	Regression	3.215	1	3.215	3.173	.078[b]
		Residual	99.295	98	1.013		
		Total	102.510	99			
More than 10	1	Regression	10.111	1	10.111	11.214	.002[b]
		Residual	34.264	38	.902		
		Total	44.375	39			
a. Dependent Variable: The cost objective were met for the project							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Number of People Involved	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to 10	1	(Constant)	1.825	.354		5.153	.000
		Knowledge Management	.320	.180	.177	1.781	.078
More than 10	1	(Constant)	.658	.463		1.422	.163
		Knowledge Management	.772	.231	.477	3.349	.002
a. Dependent Variable: The cost objective were met for the project							

Is there a relationship between industry sector and ICT project performance- the cost objectives were met for the project

ANOVA[a]							
Industry sector that the project fall under	Model		Sum of Squares	df	Mean Square	F	Sig.
IT	1	Regression	2.266	1	2.266	2.228	.140[b]
		Residual	76.254	75	1.017		
		Total	78.519	76			
Telecommunication	1	Regression	2.452	1	2.452	2.089	.161[b]
		Residual	28.164	24	1.173		
		Total	30.615	25			
Others/None given	1	Regression	7.387	1	7.387	8.116	.007[b]
		Residual	31.856	35	.910		
		Total	39.243	36			
a. Dependent Variable: The cost objective were met for the project							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Industry sector that the project fall under	Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
			B	Std. Error	Beta		
IT	1	(Constant)	1.744	.397		4.394	.000
		Knowledge Management	.308	.206	.170	1.493	.140
Telecommunication	1	(Constant)	1.311	.671		1.955	.062
		Knowledge Management	.487	.337	.283	1.445	.161
Others/None given	1	(Constant)	1.007	.542		1.857	.072
		Knowledge Management	.740	.260	.434	2.849	.007
a. Dependent Variable: The cost objective were met for the project							

Is there a relationship between level of complexity of the project and ICT project performance- the cost objectives were met for the project

ANOVA[a]							
Level of complexity of your project	Model		Sum of Squares	Df	Mean Square	F	Sig.
High	1	Regression	4.061	1	4.061	4.462	.039[b]
		Residual	56.423	62	.910		
		Total	60.484	63			
Medium	1	Regression	8.007	1	8.007	7.450	.008[b]
		Residual	70.934	66	1.075		
		Total	78.941	67			
Low	1	Regression	2.255	1	2.255	2.929	.138[b]
		Residual	4.620	6	.770		
		Total	6.875	7			
a. Dependent Variable: The cost objective were met for the project							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Level of complexity of your project	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	1.541	.363		4.243	.000
		Knowledge Management	.381	.180	.259	2.112	.039
Medium	1	(Constant)	1.264	.460		2.751	.008
		Knowledge Management	.650	.238	.318	2.729	.008
Low	1	(Constant)	-1.597	2.052		-.778	.466
		Knowledge Management	1.622	.948	.573	1.712	.138
a. Dependent Variable: The cost objective were met for the project							

Is there a relationship between project level of uncertainty and ICT project performance- the cost objectives were met for the project

ANOVA[a]							
Level of uncertainty of your project environment	Model		Sum of Squares	Df	Mean Square	F	Sig.
High	1	Regression	3.533	1	3.533	3.279	.078[b]
		Residual	42.028	39	1.078		
		Total	45.561	40			
Medium	1	Regression	5.472	1	5.472	5.239	.025[b]
		Residual	84.601	81	1.044		
		Total	90.072	82			
Low	1	Regression	2.232	1	2.232	2.902	.111[b]
		Residual	10.768	14	.769		
		Total	13.000	15			
a. Dependent Variable: The cost objective were met for the project							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Level of uncertainty of your project environment	Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	1.403	.492		2.853	.007
		Knowledge Management	.443	.245	.278	1.811	.078
Medium	1	(Constant)	1.509	.409		3.686	.000
		Knowledge Management	.478	.209	.246	2.289	.025
Low	1	(Constant)	1.111	.704		1.579	.137
		Knowledge Management	.590	.347	.414	1.704	.111
a. Dependent Variable: The cost objective were met for the project							

Is there a relationship between nature of the project team relationship and ICT project performance- the cost objectives were met for the project

ANOVA[a]							
Nature of the project team relationship	Model		Sum of Squares	Df	Mean Square	F	Sig.
Willingness to cooper	1	Regression	6.861	1	6.861	6.789	.011[b]
		Residual	86.912	86	1.011		
		Total	93.773	87			
Medium	1	Regression	4.188	1	4.188	4.059	.049[b]
		Residual	51.581	50	1.032		
		Total	55.769	51			
a. Dependent Variable: The cost objective were met for the project							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Nature of the project team relationship	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Willingness to cooper	1	(Constant)	1.478	.348		4.246	.000
		Knowledge Management	.456	.175	.270	2.606	.011
Medium	1	(Constant)	1.358	.510		2.661	.010
		Knowledge Management	.521	.258	.274	2.015	.049
a. Dependent Variable: The cost objective were met for the project							

5.E. Project type is as a moderator between knowledge management and ICT project performance (The project produced a high quality solution/service)

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.011	1	4.011	5.831	.017[b]
	Residual	94.925	138	.688		
	Total	98.936	139			
a. Dependent Variable: The project produced a high quality solution/service						
b. Predictors: (Constant), Knowledge Management						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.433	.236		6.064	.000
	Knowledge Management	.288	.119	.201	2.415	.017
a. Dependent Variable: The project produced a high quality solution/service						

With project time as a moderator between knowledge management and ICT project performance (The project produced a high quality solution/service)

ANOVA[a]							
Time taken to complete your project in months	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to 6 months	1	Regression	4.952	1	4.952	7.954	.006[b]
		Residual	47.934	77	.623		
		Total	52.886	78			
More than 6 months	1	Regression	.185	1	.185	.242	.625[b]
		Residual	45.225	59	.767		
		Total	45.410	60			
a. Dependent Variable: The project produced a high quality solution/service							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Time taken to complete your project in months	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to 6 months	1	(Constant)	1.215	.305		3.982	.000
		Knowledge Management	.427	.151	.306	2.820	.006
More than 6 months	1	(Constant)	1.728	.370		4.664	.000
		Knowledge Management	.094	.191	.064	.492	.625
a. Dependent Variable: The project produced a high quality solution/service							

With project size as a moderator between knowledge management and ICT project performance (The project produced a high quality solution/service)

ANOVA[a]							
Project_size	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to R100 000	1	Regression	1.707	1	1.707	2.435	.122[b]
		Residual	60.293	86	.701		
		Total	62.000	87			
More than R100 000	1	Regression	2.273	1	2.273	3.289	.076[b]
		Residual	34.554	50	.691		
		Total	36.827	51			
a. Dependent Variable: The project produced a high quality solution/service							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Project Size	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to R100 000	1	(Constant)	1.504	.330		4.551	.000
		Knowledge Management	.258	.165	.166	1.561	.122
More than R100 000	1	(Constant)	1.357	.343		3.960	.000
		Knowledge Management	.318	.176	.248	1.814	.076
a. Dependent Variable: The project produced a high quality solution/service							

With project level of complexity as a moderator between knowledge management and ICT project performance (The project produced a high quality solution/service)

ANOVA[a]							
Level of complexity of your project	Model		Sum of Squares	df	Mean Square	F	Sig.
High	1	Regression	2.357	1	2.357	2.959	.090[b]
		Residual	49.378	62	.796		
		Total	51.734	63			
Medium	1	Regression	2.382	1	2.382	4.110	.047[b]
		Residual	38.250	66	.580		
		Total	40.632	67			
Low	1	Regression	.925	1	.925	1.405	.281[b]
		Residual	3.950	6	.658		
		Total	4.875	7			
a. Dependent Variable: The project produced a high quality solution/service							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Level of complexity of your project	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	1.307	.340		3.848	.000
		Knowledge Management	.290	.169	.213	1.720	.090
Medium	1	(Constant)	1.416	.337		4.195	.000
		Knowledge Management	.355	.175	.242	2.027	.047
Low	1	(Constant)	4.349	1.897		2.292	.062
		Knowledge Management	-1.039	.876	-.436	-1.185	.281
a. Dependent Variable: The project produced a high quality solution/service							

5.E. With level of uncertainty in project environment as a moderator between knowledge management and ICT project performance (The project produced a high quality solution/service)

ANOVA[a]							
Level of uncertainty of your project environment	Model		Sum of Squares	Df	Mean Square	F	Sig.
High	1	Regression	1.227	1	1.227	1.465	.233[b]
		Residual	32.675	39	.838		
		Total	33.902	40			
Medium	1	Regression	5.682	1	5.682	8.830	.004[b]
		Residual	52.125	81	.644		
		Total	57.807	82			
Low	1	Regression	.934	1	.934	2.177	.162[b]
		Residual	6.004	14	.429		
		Total	6.937	15			
a. Dependent Variable: The project produced a high quality solution/service							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Level of uncertainty of your project environment	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	1.553	.434		3.582	.001
		Knowledge Management	.261	.216	.190	1.210	.233
Medium	1	(Constant)	1.034	.321		3.218	.002
		Knowledge Management	.487	.164	.314	2.972	.004
Low	1	(Constant)	2.674	.525		5.089	.000
		Knowledge Management	-.382	.259	-.367	-1.475	.162
a. Dependent Variable: The project produced a high quality solution/service							

With nature of the project team relationship as a moderator between knowledge management and ICT project performance (The project produced a high quality solution/service

ANOVA[a]							
Nature of the project team relationship	Model		Sum of Squares	df	Mean Square	F	Sig.
Willingness to cooper	1	Regression	4.016	1	4.016	5.956	.017[b]
		Residual	57.984	86	.674		
		Total	62.000	87			
Medium	1	Regression	.387	1	.387	.531	.470[b]
		Residual	36.440	50	.729		
		Total	36.827	51			
a. Dependent Variable: The project produced a high quality solution/service							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Nature of the project team relationship	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Willingness to cooper	1	(Constant)	1.340	.284		4.712	.000
		Knowledge Management	.349	.143	.255	2.441	.017
Medium	1	(Constant)	1.642	.429		3.828	.000
		Knowledge Management	.158	.217	.103	.729	.470
a. Dependent Variable: The project produced a high quality solution/service							

5.F Project type is as a moderator between knowledge management and ICT project performance -The project deliverables complied with the contractual requirements

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.121	1	1.121	1.544	.216[b]
	Residual	100.165	138	.726		
	Total	101.286	139			
a. Dependent Variable: The project deliverables complied with the contractual requirements						
b. Predictors: (Constant), Knowledge Management						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.640	.243		6.755	.000
	Knowledge Management	.152	.122	.105	1.243	.216
a. Dependent Variable: The project deliverables complied with the contractual requirements						

With project time as a moderator between knowledge management and ICT project performance (The project deliverables complied with the contractual requirements)

ANOVA[a]							
Time taken to complete your project in months	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to 6 months	1	Regression	.008	1	.008	.010	.921[b]
		Residual	59.790	77	.776		
		Total	59.797	78			
More than 6 months	1	Regression	2.380	1	2.380	3.858	.054[b]
		Residual	36.406	59	.617		
		Total	38.787	60			
a. Dependent Variable: The project deliverables complied with the contractual requirements							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Time taken to complete your project in months	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Up to 6 months	1	(Constant)	2.083	.341		6.114	.000
		Knowledge Management	-.017	.169	-.011	-.100	.921
More than 6 months	1	(Constant)	1.148	.332		3.454	.001
		Knowledge Management	.336	.171	.248	1.964	.054
a. Dependent Variable: The project deliverables complied with the contractual requirements							

With project size as a moderator between knowledge management and ICT project performance (The project deliverables complied with the contractual requirements)

ANOVA[a]							
Project Size	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to R100 000	1	Regression	.206	1	.206	.301	.584[b]
		Residual	58.783	86	.684		
		Total	58.989	87			
More than R100 000	1	Regression	.943	1	.943	1.164	.286[b]
		Residual	40.500	50	.810		
		Total	41.442	51			
a. Dependent Variable: The project deliverables complied with the contractual requirements							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Project Size	Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
			B	Std. Error	Beta		
Up to R100 000	1	(Constant)	1.816	.326		5.568	.000
		Knowledge Management	.090	.163	.059	.549	.584
More than R100 000	1	(Constant)	1.450	.371		3.908	.000
		Knowledge Management	.205	.190	.151	1.079	.286
a. Dependent Variable: The project deliverables complied with the contractual requirements							

With team size as a moderator between knowledge management and ICT project performance (The project deliverables complied with the contractual requirements

ANOVA[a]							
Number of People Involved	Model		Sum of Squares	df	Mean Square	F	Sig.
Up to 10	1	Regression	.000	1	.000	.001	.981[b]
		Residual	72.510	98	.740		
		Total	72.510	99			
More than 10	1	Regression	3.101	1	3.101	4.589	.039[b]
		Residual	25.674	38	.676		
		Total	28.775	39			
a. Dependent Variable: The project deliverables complied with the contractual requirements							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Number of People Involved	Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
			B	Std. Error	Beta		
Up to 10	1	(Constant)	1.923	.303		6.354	.000
		Knowledge Management	.004	.153	.002	.024	.981
More than 10	1	(Constant)	1.113	.401		2.777	.008
		Knowledge Management	.428	.200	.328	2.142	.039
a. Dependent Variable: The project deliverables complied with the contractual requirements							

With industry sector as a moderator between knowledge management and ICT project performance (The project deliverables complied with the contractual requirements

ANOVA[a]							
Industry sector that the project fall under	Model		Sum of Squares	df	Mean Square	F	Sig.
IT	1	Regression	.041	1	.041	.067	.796[b]
		Residual	46.089	75	.615		
		Total	46.130	76			
Telecommunication	1	Regression	1.824	1	1.824	1.823	.190[b]
		Residual	24.022	24	1.001		
		Total	25.846	25			
Others/None given	1	Regression	.872	1	.872	1.124	.296[b]
		Residual	27.128	35	.775		
		Total	28.000	36			
a. Dependent Variable: The project deliverables complied with the contractual requirements							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Industry sector that the project fall under	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
IT	1	(Constant)	1.921	.309		6.223	.000
		Knowledge Management	-.042	.160	-.030	-.259	.796
Telecommunication	1	(Constant)	1.284	.619		2.073	.049
		Knowledge Management	.420	.311	.266	1.350	.190
Others/None given	1	(Constant)	1.492	.501		2.980	.005
		Knowledge Management	.254	.240	.176	1.060	.296
a. Dependent Variable: The project deliverables complied with the contractual requirements							

With project level of complexity as a moderator between knowledge management and ICT project performance (The project deliverables complied with the contractual requirements)

ANOVA[a]							
Level of complexity of your project	Model		Sum of Squares	df	Mean Square	F	Sig.
High	1	Regression	.871	1	.871	1.630	.206[b]
		Residual	33.129	62	.534		
		Total	34.000	63			
Medium	1	Regression	.370	1	.370	.405	.527[b]
		Residual	60.262	66	.913		
		Total	60.632	67			
Low	1	Regression	.023	1	.023	.049	.833[b]
		Residual	2.852	6	.475		
		Total	2.875	7			
a. Dependent Variable: The project deliverables complied with the contractual requirements							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Level of complexity of your project	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	1.414	.278		5.082	.000
		Knowledge Management	.176	.138	.160	1.277	.206
Medium	1	(Constant)	1.814	.424		4.284	.000
		Knowledge Management	.140	.219	.078	.637	.527
Low	1	(Constant)	2.476	1.612		1.536	.176
		Knowledge Management	-.164	.745	-.090	-.220	.833
a. Dependent Variable: The project deliverables complied with the contractual requirements							

With level of uncertainty of the project environment as a moderator between knowledge management and ICT project performance (The project deliverables complied with the contractual requirements)

ANOVA[a]							
Level of uncertainty of your project environment	Model		Sum of Squares	df	Mean Square	F	Sig.
High	1	Regression	.307	1	.307	.360	.552[b]
		Residual	33.303	39	.854		
		Total	33.610	40			
Medium	1	Regression	4.217	1	4.217	5.840	.018[b]
		Residual	58.482	81	.722		
		Total	62.699	82			
Low	1	Regression	.016	1	.016	.046	.834[b]
		Residual	4.921	14	.352		
		Total	4.937	15			
a. Dependent Variable: The project deliverables complied with the contractual requirements							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Level of uncertainty of your project environment	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
High	1	(Constant)	2.150	.438		4.912	.000
		Knowledge Management	-.131	.218	-.096	-.600	.552
Medium	1	(Constant)	1.149	.340		3.376	.001
		Knowledge Management	.420	.174	.259	2.417	.018
Low	1	(Constant)	2.034	.476		4.275	.001
		Knowledge Management	-.050	.234	-.057	-.213	.834
a. Dependent Variable: The project deliverables complied with the contractual requirements							

With nature of the team relationship as a moderator between knowledge management and ICT project performance (The project deliverables complied with the contractual requirements

ANOVA[a]							
Nature of the project team relationship	Model		Sum of Squares	df	Mean Square	F	Sig.
Willingness to cooper	1	Regression	2.732	1	2.732	4.725	.032[b]
		Residual	49.712	86	.578		
		Total	52.443	87			
Medium	1	Regression	.310	1	.310	.335	.565[b]
		Residual	46.209	50	.924		
		Total	46.519	51			
a. Dependent Variable: The project deliverables complied with the contractual requirements							
b. Predictors: (Constant), Knowledge Management							

Coefficients[a]							
Nature of the project team relationship	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Willingness to cooper	1	(Constant)	1.285	.263		4.881	.000
		Knowledge Management	.288	.132	.228	2.174	.032
Medium	1	(Constant)	2.365	.483		4.896	.000
		Knowledge Management	-.142	.245	-.082	-.579	.565
a. Dependent Variable: The project deliverables complied with the contractual requirements							

Descriptives							
The project deliverables complied with the contractual requirements							
	N	Mean	Std. Deviation	95% Confidence Interval for Mean		Minimum	Maximum
				Lower Bound	Upper Bound		
Project manager (Junior and Senior)	38	1.842	.8551	1.561	2.123	1.0	4.0
It support/Technical	9	2.111	.9280	1.398	2.824	1.0	4.0
System/software developer	35	1.800	.7195	1.553	2.047	1.0	3.0
Program manager	4	1.500	.5774	.581	2.419	1.0	2.0
Data/Business /system Analyst	16	2.063	.9979	1.531	2.594	1.0	4.0
Consultant/sales	32	2.031	.9667	1.683	2.380	1.0	5.0
Others	6	2.333	.5164	1.791	2.875	2.0	3.0
Total	140	1.929	.8536	1.786	2.071	1.0	5.0

ANOVA					
The project deliverables complied with the contractual requirements					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.505	6	.584	.794	.576
Within Groups	97.781	133	.735		
Total	101.286	139			

No relationship between ICT project performance ‘ the project deliverables complied with the contractual requirements’and all of the biographical factors of the study.

8.4 THE QUANTITATIVE QUESTIONNAIRE AND DOCUMENTS

8.4.1 THE PARTICIPATION INFORMATION FORM

Dear Sir/Madam

I am a Master of Commerce candidate in the school of economics and business sciences at the University of the Witwatersrand, Johannesburg. My dissertation is entitled: **Examining the link between social media, knowledge management and ICT project success in the South African context**. I am investigating the possible interaction effect of knowledge management practice in the relationship between social media usage and project success in the South African ICT industry.

Attached is the link to the online survey that should take no more than 15 minutes to complete. I would like to invite you to take part in this research. Your participation is entirely voluntary- it is entirely your choice whether to participate or not.

Your input is important and will attempt to contribute to an improved understanding of the potential benefit of using social media tools in a project management context. This knowledge will be expected to, in turn, contribute to increased ICT project success.

The study is for academic purposes only. The results of the study will be reported in my dissertation.

ICT professionals, like you, are the respondents of this research. Confidentiality and anonymity are ensured at all times. You will not be required to provide any information that will reveal your identity.

The survey will be stored in the school online repository for further data analysis and will thereafter be destroyed after a period of five years.

Any queries regarding the survey instrument or any other aspect of the study can be directed to me or to my supervisor, Chris Callaghan, on the numbers listed below.

Yours sincerely,

Danielle Medjo
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8.4.2 CONSENT FORM

MCOM: SOCIAL MEDIA, KNOWLEGE MANAGEMENT AND ICT PROJECT SUCCESS IN THE SOUTH AFRICAN CONTEXT

I, employee at ....., Consent to take part in the Masters research to be conducted at.....under the supervision of Mr Chris Callaghan from the University of the Witwatersrand.

I consent to the results of the questionnaire being used for the purposes of this study.

I understand that:

- Participation in this research is voluntary
- I may withdraw from the study at any time
- No information that may identify me will be included in the research report, and all responses will remain confidential.

Signature of participant Date Signature of researcher

_____ _____

8.4.3 CONSENT TO AUDIO RECORDING AND TRANSCRIPTION

This study involves the audio recording of your interview with the researcher. Neither your name nor any other identifying information will be associated with the audio recording or the transcript. Only the researcher along with her supervisor will be able to listen to the recordings.

The tapes will be transcribed by the researcher and erased after 5 years. Transcripts of your interview may be reproduced in whole or in part for use in written products that result from this study.

By signing this form, I am allowing the researcher to audio record me as part of this research. I also understand that this consent for recording is effective until the following date: October 2018. On or before that date, the tapes will be destroyed.

Participant's Signature: _____Date:_____

8.4.4 THE QUESTIONNAIRE

SOCIAL MEDIA, KNOWLEGE MANAGEMENT AND ICT PROJECT SUCCESS IN THE SOUTH AFRICAN CONTEXT

ONLINE SURVEY

By filling this survey, respondents consent to the results of the questionnaire being used for the purposes of this study. No information revealing identity will be included in the research report, and all responses will remain confidential.

Respondents are requested to identify a recent project they are familiar with in order to answer ALL questions.

Section A

In this section, please indicate your response by ticking (X) or highlighting the block that shows how much you used the following tools during the course of your project. Select all that apply.

	DESCRIPTION	HEAVY USE	AVERAGE USE	LOW USE	NO USE
1	Synchronous communication tools :live chat–Skype, Lync, Yahoo messenger, GTalk, whatsapp, BBM				
2	Asynchronous communication tools :Email, Intranet, enterprise software applications				
3	Collaboration tools: Microsoft project, SharePoint, Content management systems, Dashboards, Drop box, Google docs, JIRA.				
4	Face-to-face interaction				
5	Telephone				
6	Hand written report				

Section B

In this section, please indicate your response by ticking (X) the block that shows how much you agree or disagree with the statement.

	STATEMENT **Knowledge management** here is about giving information to the right individual at the right point of time and exclusively focuses on knowledge sharing and reuse/application.	**STRONGLY AGREE**	**AGREE TO SOME EXTENT**	**NEUTRAL**	**DISAGREE TO SOME EXTENT**	**STRONGLY DISAGREE**
7	Communication tools were used to support Knowledge management practice					
8	Collaborative tools/Knowledge management system/ Database management system were used to support knowledge management practice					
9	Non-Computer mediated communication tools were used to support knowledge management practice					
10	Knowledge was shared among the project team members					
11	Knowledge was accessible to those who needed it					
12	Feedback from past projects and experiences was used to improve this project					
13	The project re-used knowledge into practice					
14	Knowledge management added value to project management					

Section C

In this section, please indicate your response by ticking (X) or highlighting the block that shows how much you agree or disagree with the statement.

STATEMENT **Schedule** here refers to time.		**STRONGLY AGREE**	**AGREE TO SOME EXTENT**	**NEUTRAL**	**DISAGREE TO SOME EXTENT**	**STRONGLY DISAGREE**
15	The schedule of the project was the same as planned					
16	The project was delivered ahead of schedule					
17	The project had budget overrun					
18	The cost objective were met for the project					
19	The project produced a high quality solution/service					
20	The project deliverables complied with the contractual requirements					

21. What criteria did you use to define project success?

Met product/solutions requirements (within /budget/scope/quality) ☐ Was in line with PM process (within schedule/objectives) ☐ Met user involvement/User expectations ☐
All of the above ☐ other criteria ☐

Other Please specify_____

22. What did you think lead more to the success of your ICT project? Select all that apply.

Soft skills of the Project manager (e.g. Communication) ☐ knowledge sharing/reuse ☐
Use of Project management tools ☐ Project manager's expert knowledge ☐ other factors ☐

Other Please specify_____

Section D

The following relate to the project type you worked on. Please indicate your response by placing an X or highlightingthe block that shows your answer.

23. How long did it take to complete your project? _____Months years

24. What was the project size (cost)? R _____

25. How many people worked on the project? _____

26. In which Industry sector did your project fall under?

IT ☐ Telecommunication ☐

27. How would you describe the level of **complexity** of your project?

High ☐ Medium ☐ Low ☐

28. How would you describe the level of **uncertainty** of your project **environment**?

High ☐ Medium ☐ Low ☐

29. How would you describe the **nature** of the project team **relationship**?

Willingness to cooperate ☐ Medium ☐ Unwillingness to cooperate ☐

Section E

The following relate to some personal information on the respondent.

30. What is your age? _____

31. What is your gender? _____

32. What is your job title?

Junior project manager ☐ (senior) Project manager ☐ system/software engineer ☐
Knowledge management manager ☐ IT support officer ☐ Communication manager ☐
Program manager ☐ Data administrator /Business analyst ☐

Other Please specify_____

33. What is your highest obtained qualification? _____

34. How many years of experience do you have in project management? _____

35. Are you PMI certified? Yes ☐ No ☐

36. If yes, specify your PMI certification?

CAPM® ☐ PMP® ☐ OPM3® ☐ PgMPSM ☐ Prince2 ☐ ProductSuite

Other Please specify_____

37. is your company

Public ☐ Private ☐ Governmental ☐ Nonprofit/Not-for-profit ☐

38. What Industry are you working in?

Banking/Finance ☐ Insurance ☐ IT ☐ Telecommunication ☐ Other ☐

39. Do you have employees/colleagues working from remote locations? Yes ☐ No ☐

40. How many IT/ICT projects have you been involved in ?_____

Thank you for your participation in this survey, your input is greatly appreciated!

8.5 TRANSCRIPTS

Interview 1

Interviewer: Good Afternoon Mr. Thobani.

Respondent: Afternoon Danielle

I: thank you for taking the time to participate in my research. So before we start with the interview, I just want you to understand that this interview is really about capturing your perspective on the use of social media technologies and the sharing and reuse of knowledge during the course of any project you've been involved in your company. So it's voluntary and you are free to stop participating at any stage of the interview. My first question to you will be how many years of experience do you have in that sector as a technician professional- you said you are a…

R: An IT technician specialist. I worked in the standard Bank IT department for three years now. I started in January 2011.

I: Ok. So who are your main clients? Is it only in the banking sector or you are actually involved in other sectors?

R: With us, it's different. We are Standard Bank but our focus is IT AFRICA. We ensure that the seventeen countries in which Standard Bank operates on- we look after their internet banking or let me just say we are looking at their channels- that will be Internet banking, ATMs and their core systems. So our clients are the sub-companies within Standard Bank in Africa.

I: Oh Ok. That's interesting! So my next question: basically I want you to describe to me any project you've been working on recently by specifying the duration of that project and the team size as in how many people worked on the project with you?

R: Euhm, the project that we recently completed was ULP upgrade. ULP is basically upgrading the ATMs-you know the functionalities and everything and making sure that the guys in other countries can interact or have connection easily rather than always go to the specific ATMs. So the project started last year in June and we completed it this year June. It was strictly one year to complete this project.

I: Ok. And then, how many people you worked with?

R: This will be a lot. Ok, from SA side, although the country allocated five people to the project- on and all in our team, roughly we were about eighteen of us.

I: Ok. In that project, did you use a particular social media tool? By social media tool, I mean any tool linked to computer mediated communication systems such as emails, text messages even through cell phones, or specific software like Microsoft Project or Sharepoint or LinkedIn. I am just giving you examples so that you have an idea of what I mean by social media tools.

R: Basically for us, it was a mixture of tools. Obviously Microsoft project was used and uploaded notes of communicating. On top of it, we used a specific- not specific, it's a Microsoft link not different from your typicalBBM (BlackBerry Messenger) just that it is installed in our computers. All you have to do is access the network and you can always communicate with it. This is what use mostly especially when travelling to other countries in order to interact with the guys we left behind.

I: Whats the name of the tool?

R: Lync. So what it does, you can talk with people, you can video chat, you can send them everything- its related to Skype just that its only for the company users

I: Ooh a company specific software…did you use it for that project?

R: we used it for other things but for the project, we used it mostly to communicate

I; so you used Lync to communicate with other project team members- did you use it for any other purposes?

R: Yes, we did use it to share information. Especially when we find out that guys in other countries they are missing certains components or software updates, so we used the same tool to send them the information they needed in…

I: Has the usage of that tool helped you in terms of the project outcome?

R: It was quite effective because if one has to locate the …hassle, we had to go under if we didn't have that, you know. Try for instance to- you find out you will be forced to send whatever file- you put it on the system….the file is big and you may not….the system is

called Spo. That's the systems we use inside to connect the ATMs and have the access to… normally what we had to do previously we will send files through that systems and then we…to access that info…. But then now we use LYNC because it has made things easier. We don't have to interact to send…

I: Ok. Still going back to that project, did you try to go back to past projects and use the knowledge from these past projects or you actually went to somebody to give you advice whenever you encounter a challenge?

R: Well, mostly we interact with the vendors- they provided us with the software. Whenever we encounter any challenges, we are going back to them but then now these are the challenges we encounter for the first time. The thing is prior to deploying the project, we had to first simulate everything in center..vendors. so we did a simulated installation in our ATMs and for testing and ensuring everything is working 100 percent. Once we deployed it, we had to deploy…always encounter issue… so we had to ask either team member what can we do to resolve and if it proved to be a huge challenge, we would go back to the vendor and ask them for assistance.

I: Ok. But then when you communicate with these vendors do you actually do it face-to-face or you use LYNC? in what format do you ask assistance?

R: Ok. There is a system that they have developed for them in order to chack all the incidences we might have- that mini site they created called the trackbox. When you log in that site, you log the information about the issue and after that you call them and send them an email saying "ok, we have logged this incident, this is the incident number..'' and from then, if they ask you for log, in order for them to further investigate what might have been the problem.. the thing is the system that they have didn't cater for that and now when you are sending information to a vendor….so when you send them files , logs and everything, we have to use SKYPE then.

I: That's interesting. Other than that, have you ever shared a project experience with a collegue inside or outside of your current company?

R: Yes. Especially when travelling. After my last trip to Botswana, when we come back we always have to provide some kind of presentation on what you did, the challenges you encountered, who did you get to know, what was the experience like..soeverytime after travelling to deploy a project, we always have to present. Sometimes you find out, you don't

necessarily have to do a power point presentation, its just a social gathering where you relate everything. For the guys in country normally what we do, we catch up now and then, ask them what happened just to find out if they are experiencing any issues and if they did, that's when we are going to give them support.

I: Ok. So this is the final question, do you think that using these tools-wether its LYNC or SKYPE can actually affect the way you share a project experience?

R; Well I can say it does play a vital role towards that because now if you were to think without these tools we used during the project, it would have been hard- for instance share certain information, giving security features specific to the bank. It would also be hard just to communicate… so these tool do play a vital role in our instance .

I: All right. This has been a really illuminating input, thank you so much mr Thobani for your time.

R: You are welcome.

Interview 2:

I: Good morning R. we have a telephonic interview scheduled this morning.

R: Yes. How are you/

I: I am good. Thank you. Shall we start?

R: Yes, we can start.

I: All right. My first question, how many years of experience do you have in IT project management?

R: Its about five years.

I: Ok. What kind of customers do you usually provide services for? Is it only in the banking sector or you are also involved in other sectors?

R: No, it would be only banking; we support all the branches in the country.

I; All right. Next I would like you to describe to me a recent project you worked on by specifying the duration of the project and the team size.

R: We do internet banking and mobile banking.

I: I am specifically trying to have an overview of your experience in ICT (information and communication technology) projects within your field and would pretty much like to know whether you use social media tools during these projects and for what purpose?

R: Currently what we are supporting or the project we are dealing with is under internet banking and mobile banking .social media we don't really use that often in our work environment and in other budget in other countries. So we just communicate via telephone callsor via emails and conference calls.

I: Is it video conference or normal telephone conference sessions?

R: Yes, we do have video conferences now and then …all. That's what for all the projects and also if any need to …vendors, we use Skype.

I: Ok. What exactly do you use video conference for?

R: It is mainly for communication since we are working in so many countries so yes, we communicate with these countries or updates on the project.

I: All right. Do you think that using these tools-whether its video conference or emails, other than saving money and time, actually help you in terms of the project outcome of what you are actually doing?

R: Yes, it does help a lot. And we also see the peoplethat we work with from the other side.

I: Oh yes. And when you are working on these projects and you encounter any kind of challenges, do you actually try to consult someone, a collegue maybe, for advice? Or you have some kind of repository that you check and use the knowledge from past projects with regard to the matter at hand?

R: Ok. Currently we deal with development teams. We also deal with our peers, we also…our management and we do have a repository where we actually put all our procedures and softwares…for all of us.

I: Do you actually use information from that repository?

R; Yes, we do.

I: But then when you go to other people for advice, is it helpful?

R: Yes, it is.

I: How is it helpful? I mean what I want to know exactly, is whether you go to these people directly-face to face in social gathering or just email? What format is it?

R: no, its just verbal communication or it might just be via email if it's not based in our offices?

I: Do, you think that using these tools, can affect the way you share a project experience?

R: Yes. If we don't have those items available, then how are you going to be able to communicate to your stakeholders, or to your people or to your customers in other customers in other countries? So its kind of vital that we have these tools.

I: All right, so basically, you are saying that, in your context for exemple, in the banking sector, its actually important to use these tools not only for communication but also to share a project experience as you mentioned earlier?

R: Yes, I think it all…..

I: Ok. That was my final question. Do you have anything else- anything other than what we discussed related to your experience in your department in using these tools or sharing a project experience, which you would like to share?

R: No, I think actually… what we are doing on a daily basis so there is nothing extraordinary.

I: Alright thank you so much Chystal for your time and input. I really appreciate it.

R: My pleasure. Bye.

Interview 3:

I: Alright, my first question to you. Can you just tell me a bit about what you are doing there at MNET.

R: Ok. In summary what we are doing here we integrate data components into one query system in all the units that actually is a box….make sure that all….without causing…

I: Ok. How many years you've been doing that?

R: it's been three years now>

I: And have you worked in other sectors or only the broadcasting industry?

R: No, just the broadcasting, I don't know any other things besides the broadcasting.

I: Ok. Can you describe to me a recent project you worked in by précising the project duration and team size within your department?

R: Yes, we have worked on the ''explorer decoder project'' from 2010 to 2013.

I: Ok. But how many people worked with you on that project?

R: this project was huge; I think we had 150 people working on it.

I: Whoo. In relation to your experience with this particular project or any other one, have you used a particular social media tools with regard to help you with the project outcome?

R: so basically are you asking whether we use any media tools during…?

I: yes, any social media tools- I don't really know much about the broadcasting sector but maybe you guys, have some kind of intranet systems, or sharepoint or Microsoft project- any project management related tools that you use ?

R: We have a lot of tools. We have a Gig.So you see its for vision tracking software. And we have BYROKI that we use for tracking and logging. We have double… which is used for setup box functionality and … so you can run sixty boxes at once and then it will just test everything on those boxes.

I:ok. For what purpose do you use these tools you just named in relation with the project?

R: Well Byrotic, we use it for communication between different vendors. We got vendors for drivers…. Vendors formiddlewares, vendors for applications, so its just one repository tool that we use for communication tool that we use for….effects inbox.

I:ok. So it's basically to communicate and also project updates between you and the vendors?

R: Alright, say for instance.we are dealing with one issue fine sample where the box just trashed right often... We cant actually link where there are drivers issue but in our investigation, we actually update the database with what we..Investigated and then over…the vendors..the security and vendors analysed that there is a problem…..

I: But do you think using these tools has been positively or negatively helpful in term of the project outcome you worked on?

R: yes, it has been. I mean with this project we had team in the UK, teams in INDIA, China as well. So just imaginedifferent teams in different countries logging into one system just to communicate. So because of that system, then we will have communication break down and…we wouldn't know what has happened so this system allows just check into repository and then easier the communication for everyone.

I: ooh that's really interesting. And when you encounter challenges during the course of the project, have you tried to recall past experience from past projects or you consulted other people for advice?

R: you know, in our team, we have an open policy where we actually promote knowledge sharing. So if you face a problem you can go to any other guy who is in that field and we are always prepared to help out and acknowledge

I: ok. But what about knowledge reuse? Do you have any kind of repository system where you can actually log in and use the information inside to help with the project?

R: We got our own WIKI page for different teams so whatever team member who has..just go to it and get that knowledge. So everyone in the team has..like a student. So if you go there, you can just see every other scenario and experience that another team member has experienced and then you can phone him.

I: and what about you? Have you ever shared a project experience with a collegue outside or inside MNET?

R: I used to work in technical operations and what we do- we operate with other departments where we had trouble with transmission program… so actually I pass on my knowledge on broadcoasting to another.collegue.thats all.

I: And in what format was it done?

R: It was a formal session, organised via email with the respective attendees…actually learning the broadcasting industry and we went to one conference room …..

I:Ohthat's nice. I do hope the training was conclusive and help them?

R: no, no. it actually did. When we actually transmit with a box so you understand what came through and you understand what coming in the box. I think its not only about the broadcast but you also need to understand what you are decoding- what you actually receiving and what you actually translate.

I: Yes. Ok, this is my final question. Do you think that using IT in general can actually affect the way you share a project experience?

R: huum. No. I do believe there are other advancements we can do in general because you know with IT, everything moves on every year, so you cant actually…with one…that you have where everything advances. I think it helps but in future it…for once with advancement, the system changes.

I: ok. So you think that even though IT is upgrading every year, it does have a role or place in the project management world?

R: Yes, of course. 100%.

I: Alright, are there any other things related to your experience in using social media tools or sharing a project experience that you would care to share?

R: I don't think all projects have fundamental structures. So with big projects, you need to suppress the number of components in… so you need to have an open mind to open sofwares . you are not linked to commercial stuff that you have buying. I mean with our explorer, most of our components were open sources. Java is open source.so you need to have an open mind..Just to make sure that you get the best out of a project.

I: But you know in your sector you were talking about exchanging information, communicating, meeting with people in the UK, maybe it only applies or it is only beneficial to use these tools for teams that are not collocated, don't you agree?

R: Well I believe so. But communication can break easily. Say for instance, in a big company, the same team are separated by just buildings- just imagine you need to speak to a person or consult with an integrator; you need to walk right across to the other building. During that time when you walk the message is not delivered as you thought about it the same way as you were working at your desk. So if you are at a central place where you can just write everything to that person and someone will get it at the same time and exactly the same format- I think that affects cross confrontation.

I; Well, thank you mrMabuya. I hope you wont mind me contacting you if need be. Have a lovely day.

Interview 4:

I: Hi, this is Danielle from Wits University

R: Yes, how are you?

I: I'm good. Thank you, and you?

R: Very well, thank you.

I: So are you ready for the interview then?

R: Yes, I am. Lets see how quickly we can get through this.

I:All right. So before we get into the interview, I just want you to understand that this interview really aims to capture your in-depth perspective of the use of social media technologies and also knowledge sharing and reuse during the course of a project you've been involved in a company like ADAPT IT. So my first question to you will be: what exactly do you do there, can you tell me a bit about your job description there at ADAPT IT?

R: Well basically it is project management via..checking project concluding, also assessment of projects…customers…to define the project…. To ensure success…development and applications. So that's what…

I:All right. I saw that ADAPT IT provides services for several industries like manufacturing and energy…

R: yes, we cover all that is correct.

I: So how many years of experience do you have in IT project management?

R:euhm, let me think. Over ten to fifteen years. I do think it's twelve to be exact.

I: Whaou! Ok. Can you think of a project you recently worked on and describe it to me by specifying the project duration and team size?

R:euhm that varies. Currently we have projects that run for months and two to three years….so I do multiple projects , I just don't do one. And we have team from two-three up to fifteen people working on the particular project.

I: ok, lets choose a particular sector you work in, for instance the manufacturing industry, what kind of project do you usually run in that sector?

R: its software development within this industry.

I: ok. Relating to your experience in these projects, have you ever used a particular social media tool?

R: yes, we use most of them- we use Microsoft project, you know from a planning perspective…the system that is purely project management driven. Sharepoint, we are moving towards that but not really using that. We do use other aspect like the… fedex..also one of the tools of social media. Also we recently introduced LYNC so we do interact….we don't really do that outside of the company…..big one as well.

I: ok. And then what is the main function of these tools during the projects you run?

R: Microsoft project is basically a methodology project tool and then tracting it. Lync or skype and …to communicate with the team cause the team can be off site. Then they use tablets.

I: so basically it's mainly for communication and project updates with the team?

R: yes, it is for communication, exchanging information with the team, for reading documentation,

I: and do you think that using these tools has been helpful in terms of the project outcome?

R: yes, it is very contributive positively. I mean, people can communicate from the office or from home and the …site; you need to interact…so it is useful.

I: ok, still with these projects you worked on, because you mentioned you worked in several projects simultaneously, have you tried to recall past experience through past projects or consulted somebody for advice whenever you encountered challenges?

R: with the company mission, depending on the nature of the project and the time, we recall on past experiences and formulating things. So my approach when im working through the projects,..the team…internally the customers..to ensure everything is durable…..im basically carrying…more beyind issues everyone experience…

I: but what about knowledge reuse?

R: yes, we use repository- share project documentation… project management software…past project we can assess, you know what happened…do what you can…

I: ok, and getting access to the information from these repositories or from the sharing of knowledge, is it also helpful in terms of the project outcome?

R: Yes, it does, it helps with the project. Obviously we don't do that. Information in front …in the direction it should. If we have the information at hand, we are ensuring a more successful project.

I: are you saying that if you have the information at hand, you don't really need to go back and check the repository for further information?

R: now we can. We may require more information… so its only on case by case basis. It all depends on what information you are looking for.

I: About you, have you ever shared a project experience with a collegue inside or outside of ADAPT IT?

R:euhm, we don't, because sharing public experience can be something that not …private because of ….in terms of clients exposure and things like that. But in terms of general project management, yes. You know we do…with clients and having discussion and they understand… when we come back

I: ok. But in what format is it done?

R: on discussion, we haven't really done anything in terms of written exposion to that. We …..outside the company general fair…communication…just nvolved in the project methosodlogy…we wont take the company details outside for confidentiality reasons

I: do you think that using these tools or IT in general can actually affect the way you share a project experience- positively or negatively?

R: it can be a bit of both- I mean depending on the context you are going to achieve. On the positive side, it obviously the success of the project that using these tools and on the negative side, it can be some misunderstandings sometime in terms of moving away from a face-to-face interaction, the requirement can be ..you know… can be….if you know what I mean

I: so we have pros and cons. But what about social media technologies, do you think it has its place in the project management world?

R: Well, I see its so dynamic and obviously projects will need to…one at the time. And yes, social media r…. interact in projects..on what you do..Initially to what you will be doint g so the nature is that …and it will require, depending on the media, the use of it.

I:well, that was my last question. I just want to thank you for your input. Hopefully can we contact you for further information maybe?

R: surely, if you need it.

I: OK, thank youSushika, Bye

R: Bye.

Interview 5:

I: So shall we start?

R: Yes, we can start.

I:so my first question is really about you telling me a bit about your job description at BUSINESS CONNEXION.

R:I'm the manager here. I'm responsible for transitions and projects activities. And I have a bit of project managers and administrators that report to me.

I: All right. How many years of experience do you have in IT project management?

R: I don't really manage projects myself and I only manage the big project but obviously I got past IT experience and IT manage experience

I: Alright, that exactly what im looking for…

R: ok, now we are 2013- that makes it twenty three years.

I: Ok. I understand that BUSINESS CONNEXION deals mainly with application services, cloud computing, communication services, so what kind of sectors or corporate clients do you usually provide these services for?

R: do you mean my team or the company?

I: your team, yes.

R: ok, we are not limited to any particular sector; we deal with all sectors from petrochemical, to financial, retail.

I:oh, all right. So you said you never managed a project yourself but you have a bit of IT experience. So according to your experience, can you describe to me a recent IT project you worked on by specifying the project duration and the team size?

R: for project, people report to me- I myself not involved in projects but the people that report to me, the smallest was project manager and one person that does the work and it took us about three weeks. The largest will be about eight programme managers and five project managers , about nineteen people working on the project and the project would last two years.

I: great! A statement says that a project managers spend about 80% of his time communicating, do you agree with such statement?

R: I would say probably about 50% of his time communicating.

I: ok, according to your experience with IT project, do you use a particular communication or collaboration tools?

R: Yes, we got emails, and SMS, and BBMs and sharepoint. Specific to the project hold, we have two additional tools that we use for communication…PPO, that's a software and PPM

I: ok, that's good to know because my research aim is to investigate the interaction between social media usage and knowledge management within the context of IT/ICT projects. So I'm interested in knowing the kind of social media tools you use, the purpose of such tool and whether it has an impact on the outcome of your projects?

R: the most…tool, the one that we use…will be email. The beneficence of that is that you are able to communicate with a whole bunch of people,..send messages and you can initiate communication without actually carrying a personal device. Oh, we also use LYNC. So what we do with LYNC, its something that we will use for teleconferences and telephone posts. SHAREPOINT we use often for share documentation and we create a group environment with people work on the documents to the cost of project team…..because they never do…project teams are always distributed so obviously the electronic communication is very very important to us.

I:All right, that actually makes sense. Looking at the knowledge management side, I am specifically looking at knowledge sharing and knowledge reuse. So still relating to your experience, did you ever try to recall the knowledge from past projects or did you consult other people for advice whenever you encountered any challenges?

R: Yes, we do. The first thing is we almost always try to …the experience of a project and in those projects, we always have a ..activity where that stuff is documented and then goes into a –what we will call a ….device. the other thing is when somebody s..a project similar to a previous one, we always go to sharepoint and get related stuff like design, business requirements, specifications, projects plan, team organizational structure-those kind of things that will get together. We have a person who is responsible for governance but he is also very

fit at knowledgeable project managers and he would review project managers and individuals and then take them through coaching session to …share the knowledge across the unit.

I:ooh, that's interesting. But what about you, have you ever shared a project experience with a colleague inside or outside of BUSINNESS CONNEXION?

R: no, we don't. we… the knowledge inside we don't share it. We treat that at intellectual property because we obviously pay quite a bit of people to gain the experience and obviously we don't just ditch it out to everybody.

I: Alright. The next question will be: do you think that using these tools you names earlier, actually can affect the way you can share a project experience?

R: yes, I do. Obviously the fact that they bargain themselves into documentation mechanism, the knowledge will be available at anytime in the future. The only thing that we struggle with is to have it available- I mean you do a project now, things like that are… and how do you get into that environment and find to get what somebody else has done before? You do a project on- lets say on plotty files. How will I know that previous..call and …that im doing might gude me…its difficult to lay your hand on the function. Ok so for that reason we have the governance and coaching activities where we have one..specifically, there are two other people and we try and get them to have …the knowledge…and try to split it that way

I: Ok so I understand that you guys interact directly to share knowledge via coaching sessions. So do you think that social media in general has its place in the project management world?

R: it probably does. The most needy tools that I would pick up would be things like BBM where we create groups so we communicate with the group at all time or you can get into a group chat like and things like LYNC for teleconference …two much powerful media tools.

I: ok. We are coming to the final question. Do you think that the ICT industry as a whole really can contribute to the sustainability or the sustainable development of the community/economy it is involved in?

R: Well, I can't see why it cannot. It's too much of a active participate… and given that everything just …the change. Project management is the way to restructure the change so I think it has a massive impact.

I: ok. Any particular activities is BUSINESS CONNEXION involved in regarding that matter?

R: Yes, we do have social responsibilities projects that we do particularly in a small school where…juniors- we will not just install anti technologies for them but we will get some of the juniors to be active on the project and understand what has been done so they learn ..as well.

I: Ok. Well, thank you so much. It was really helpful. Can we contact you for further information if needs be?

R: of course, you can.

I: thanks again Bryan.bye.

R: cheers, pleasure, thank you Danielle, Bye.

Interview 6:

I:First question. Can you give me a brief overview of your job description there at ONLINE INNOVATIONS?

R: I am the business manager and I sort of specialise in consultant where I give advices on how to position themselves on the web, websites, social media and so on.

I: ok. How many years of experience do you have in that field?

R: Probably about fifteen.

I: Whaou, and what kind of corporate clients or sectors do you usually provide these consulting services for?

R: Alright, from small to large enterprises- any sector from..Industry to retail, manufacturing, industrial market….

I: Ok. As the business owner of ONLINE INNOVATIONS, I am not sure whether you are directly involved in the web consulting activities or any other in that enterprise, but if you do, can you briefly explain to me a specific task you've been involved in during these projects by specifying the duration and team size

R: I am not sure- we are a …company so we are quite small, we probably have a team of fifteen people and we got about five of those are very much on the design of website. When it comes to marketing, brand, positioning and so on, we probably have another five which are probably more when taking site when it comes to development, the logging of systems and expect all the way. The other five probably in administration I would say. When we do get involved in projects, we don't really have the capacity to get involved in several large projects at the time so we probably end up with one large project at the time while handling some small ones…over the same time period, …scheduling bigger projects and see what it involves.

I: ok but how long do you usually, lets say, constructing a website for a client, how long does it usually take you to do such?

R: from initial contact to completion, it depends on…the project is just a small business where we are just looking for the website, almost like we say, it's a brochure website where its just one thing to have some …you probably looking at anything from three weeks to six

weeks. Obviously, the bigger thing-if you start to integrate with business system blog site, getting more business type of application, like e-business, online shopping, environment, that can take up to a year.

I: ok. But then according to your experience with these projects, have you ever used a particular social media tool- I am talking about collaboration or communication tools?

R: No! We don't.

I: I am also looking at the interaction of knowledge management with the success of these projects. So when working on these tasks, have you ever tried to recall experience from past projects or you consulted other people for advices when you encountered challenges?

R: being a small business, we are quite- we are always under a lot of pressure when it comes to time, you know when it comes to documenting. Im sure if we were an …business, or large corporation, all those type of things need to have some sort of reporting and some sort of – whats the name for that, legacy..documentation to report challenges and handling of results. Being small, you know we don't have the time tot of so be academic about our.approach. I wouldn't so say

I: you are the owner of that small business, don't you have some sort of programme where you encourage people to share their experience on the project they worked on?

R: internally or outside of our business?

I: Internally

R: internally, of course yes. We end up- I mean things are quite small so we,,,work very very closely on running projects. We got our own project management system that we use to schedule tasks and responsibilities and so on. But there are some things that we develop ourselves, not official product. So you know , being a small businness assist, you know. When it comes to a large project, we use all the…it involves and when it comes to knowledge sharing, I would suppose, its not like there are people working in isolation somewhere….

I: oK. My final question to you will be whether you think that ICT industry as a whole can contribute to the sustainable development or economy it is involved in?

R: the area is so broad- I would say there is a space for potential platforms that bring communities together. So obviously there is a lot of…I am not quite sure what area of the industry you would like me to address here.

I: I classify ONLINE INNOVATIONS within the ICT industry because of the activities you guys are working on such as web consulting, SEO, internet marketing, e-commerce and so on. So im looking at the IT side of the industry, the usage of technologies/internet side of it- which is why I asked you whether you think that the ICT industry as a whole contribute or has an impact..?

R: Of course! Everybody is having or getting access to the web- I mean if you think about it, in the next four years, we would probably find that most people in South Africa will have access to the Internet in some sort whether it is via mobile devices or via desktop. So everybody is going to have access to that space to research or communicate inexpensively. I mean lets face it- It's got a massive impact on communities. It is going to bring a lot of benefit, we are all moving into that field, I mean with cellphones. Even if its not talking on cellphones, we are using our cellphones more and more to communicate, means like Facebook, Watsapp, Mxit, and short messages. So yes, it is going to have more and more of an impact.

I: But do you think that ONLINE INNOVATIONS for instance, do you guys have some kind of activity with regard to sustainability?

R: No, we don't.

I: Ok. But you are dealing with job involving social media for small and medium businesses, do you actually think that social media as a whole has its place in the project management world?

R: Yes, of course, they have….which are ideal for those type of things so yes, definitely.

I: Alright, Kevin that was my last question. We just reached the end of this interview.

R: Ok, great.

I: I do hope you wouldn't mind me contacting you again for further information if needs be?

R: Yes, you can email me and I can probably get back to you…

I; Ok, thank you so much Bart.

R; Pleasure Danielle. Bye

I; Bye.

Interview 7:

I: Hello, are you ready for the interview?

R: Yes, I am.

I: With the documents I sent you, I'm sure you have an overview of what I am about to do so I will go straight to the point. First question: could you give me a brief overview of your job description there at SAS South Africa?

R: I am the service delivery manager, customer intelligence, product..i…to ensure that all our professional services projects are delivered according to project expectations……

I:ok. I believe that SAS SA provides services for many industries in main sectors of the economy…

R: All sectors- we work in the financial, we work in banking, retail, government, most businesses.

I:Alright. How many years of experience do you have in that field?

R: myself specifically?

I: Yes.

R: One year, working at SAS.

I:But in general, in IT project management, how many years of experience?

R: Fifteen to eighteen years.

I: All right. Do you agree with the following statement:'' project managers spend about 80% of their time communicating''?

R: That's correct.

I: The next question relates to a recent project you worked on, it can be at your current company or anytime during your career. I would like you to describe such project to me by specifying the project duration and the team size.

R: Ok, I will talk about the very last project I worked on the department project. It required about fifteen people. What more do you need to know?

I: What task were you specifically doing during that project?

R: Ok, so I was the project manager working at specific projects and the project was to deliver a Solution for a banking customer within the finance sector.

I: All right. But then according to your experience with this project or any other one, have you ever used a particular social media tools during these projects?

R: We have not. We use a product called MICROSOFTLYNC for our communicators-to…communicators. But …phone only.

I: Ok. Any other tools you might use for collaboration or sharing information during the course of a project?

R: Microsoft SharePoint.

I: Ok. And do you think that using these tools you just name actually have a contribution toward the project outcome or performance?

R: Sure, definitely. It is even a requirement so Microsoft SharePoint is a centralized collaboration tool. It allows the members to communicate real time across different time zones since our teams are global- as well as to provide infrastructure to project before in documentation of projects and ….control.

I: That's interesting. The following question is basically about knowledge sharing and knowledge reuse. So what I want to know is whether you tried to consult knowledge from past projects or consulted other people for advices whenever you encountered a challenge during the course of a project you worked on?

R: Well I certainly didn't consult other people. I certainly used past experiences and creativity to overcome any challenges we experienced.

I: So you are saying that you don't have any kind of program involving knowledge sharing?

R: No, we don't.

I: But you do have some kind of repository system into which you can log in to retrieve past projects information?

R: Yes. Also….document repository via our SharePoint site. We acknowledge also….specific IT sharing products which we can certainly use for …challenges- It specifically projects because the challenges that we experience are not taking us. They were in the process in nature.

I: Ok.but you, as a project manager, have you ever shared a project experience with someone inside or outside of your current company?

R: Yes. As part of the project management methodologies that we use, we are required to submit reports but for the project outcome report as well. And these are all shared ….our project holders which…

I: Allright. Do you think that, in general, I am not talking specifically about social media tools- I am talking about information technology as a whole, do you think it can actually affect the way you share a project experience?

R: Certainly, without information technology, we wouldn't have a very recommended way of sharing. So it is a requirement.

I:Ok. You said you have some kind of system in place for knowledge reuse. Do you think that reusing the knowledge from past project has a positive contribution toward project outcome?

R: Without a doubt. I believe a project manager. ..you cannot initiate a project without consulting in my opinion.

I: Is it always the case? I mean, to be able to go back to past experiences, it means that the current project is similar to a previous one…

R: I don't agree. In almost every project I had to work in my career, I have not come across two projects which were similar. The projects I had to work on always had different objectives, different sites, differentteams, different technologies-everything is different so we have distinguishable IT projects. So the thing that we learn in these projects……in the project.

I: Ok, I see. Do you believe that social media tools or technologies have their place in the project management world?

R: I don't think so, when you say social media tools, can you be more specific?

I: I am talking about tools like LYNC, you mentioned also Microsoft project, Sharepoint – any tool for communication or collaboration

R: I don't believe tools like Facebook or Twitter are effective but from a …perspective, any kind of collaboration tools will definitely help in the project.

I: Ok. Going to the last question: do you think that the ICT industry really can contribute to the sustainable development of the community or economy it is involved in?

R: Certainly. All the projects we worked on eventually create jobs,specifically to social media …..but even that require people, managers and solutions so…

I: So what about SAS itself, is it involved in any kind of corporate social activity/

R: I would be able to answer to that….

I: Alright. Well we reach the end of the interview. So I would like to thank you for your time and inpout and hope I will be able to contact you again for further information if needs be?

R: Yes, for sure.

I: All right, thank you again Clyde.

R: Sure Danielle, Good day, bye.

Interview 8:

I: My first question: What is your job description here at Econet?

R: As a group project manager, So my role is to obviously be involved in the commercials in terms of the budgeting, the planning part of it, putting the contracts in place, making sure everything is also done from a project point of view. Shoo in an essay that could be a long description (laugh). Then in terms of managing the teams, putting in the scope, the documentation, making sure that the team does its deliverables,- you might have heard about time, cost , quality- so I do manage all of those, all the issues relating around, anything that I might experience. But most of all, I think in terms of the reason why the job is there, is to make sure from the group perspective- group meaning different countries and different teams- making sure they do all their relevant work within time, budget, scope and at the end of it, obviously doing the close out of the project.

I: it was indeed a long description.

R: it is actually more than that but…

I: Ok, im just assuming-just like your collegue I just interviewed, you are also involved in all types of industries-since I asked him about the corporate clients you guys provide services for?

R: He is the program manager- you know about project management, how it works. So we normally have a program manager who looks at all the projects. Underneath we have me, the group project manager and sometimes I help managers and project managers as well. So what happens, they will report to me , I report to Barry and he reports out. So what was the question again?

I: The industry sectors you provide services for?

R: So in Econet, we got a group project management office. So what that means is that we manage certainprojects for if it we run in the country. They will allocate project manager so lets say for example they got a project- lets say they want to build and they need a project manager. then they come to Barrie: ‘’Barrie we got this project that we want to start and we… can you please appoint us a project manager?’’ .once a project manager is appointed, everything will start running

I:and then you come in place

R: Yes I come in place. I then do all the resources schedules. I can give you the job description and you can see.

I: I got the main idea. How many years of experience do you have in this field?

R: Twenty years.

I: Whoo. According to your experience with the whole task you've been involved in, do you use social media tools?

R: Yes, you can't do project management without tools. So obviously we've got a version PMO system- which helps. You know sometimes what happens in projects, your executives want to know. they don't want to know the details, they just want to know how you are on track, scope changes, how we manage the issues, things like-what's the technology, what did we achieve, are they any risk . You then as a project manager need to give them a dashboard report-so with one view, they will be able to see what's going on. The version PMO was implemented this year to assist those executive to have a look at things. You know instead of me doing report, report..and go and do whatever they need to do. At the moment for my project for this year, I didn't implement the version PMO that much. I still ditch all my reports manually and provide them over emails. So we keep access –they get their project dashboard that shows them the achievement we did in the previous week, what are we planning for the next week, what are the key issues that we experiencing, what are the risks, where will we get the bottom, what do we need to resolve in time- you know all in cost- what are we going to do next week.

I: So basically you guys use tools to collaborate and exchange information about project updates?

R: Yes and other tools as well. Like if you have projects- meetings where you have brainstorming sessions, you would use things like Minute gender.You would use other things like Status report. There is plan that you put in place. So it depends who your audience is. For executive you do a dashboard because they don't want details. Then For your project manager and your team, you would do status reports which are little bit more detailed. And for your actual people on the ground, you would use specific plans. So you will give them a project plan, say to them this needs to be done by this dayblablabla and then you will then

create migration plans, resource plans, communication and change plans. So it is all the tools that assist people to do their job.

I: Any tools for communication?

R: Change and communication management?

I: Yes

R: for change and communication- which is plan, how are you planning to communicate within the company? We got learning academy report -that's why I got a team here. They design questionnaires, they put newsletters where you communicate with users, there are emails that we sent out, coaches are being informed about certain things, etc. there are various tools.

I: Ok. What about knowledge sharing and knowledge reuse- whenever you encounter challenges, do you consult with people for advices about it or go to a repository to retrieve information from past projects?

R: Yes, we got lessons learned. So obviously if you learn, there are certain things that you did in a project. You don't want to redo them. So in your close out, when your projects are being closed out, all those lessons learned are..then you pulled information from all the team members whether they are business ,end users, developers, trainers, sponsors, or executives- you pulled information from them. So they do the survey, evaluate... and then you put that in your project and use them again because you don't want to make the same mistakes.

I: Alright. So it's actually helpful in terms of the project outcomes?

R: yes-well if you do get the same type of projects. Obviously the lessons learned when you are building a project, it's slightly different from building a PC so you can't use these lessons learned. If the projects are similar, yes, you can use them again.

I: If not?

R: Then you just go and find out how other people, other contracting companies, what they have done-we got a host knowledge base of trying to make sure that we learn. We got SMEs as wellthat we get on board to make sure that we follow the right process. We get vendors outside todo quality checks; we implement tools internally to do quality checks as well. So

even if you don't have prior experience, there are vendors that are assisting you, making sure that what they've given us is the best out there.

I: So as a person mainly involved in all the areas of project management – whether its communication management, scope management, etc-have you ever shared a project experience with someone? How was it like?

R: Yes. I think, maybe in terms of how we should communicate, having PMO regular meetings with different project managers (PMs), that can be worked on. I think people are just very busy. We don't get to meet other PMs on what they do or share knowledge because we are kind of stuck in our own world, getting our projects life. But you will find that in any company. I think its time for people to sit together and say'' you know, our projects had this issue, what did you do?'' we don't have that luxury unfortunately. It could be nice though.

I: What about Information Technology-IT? Do you think IT as a whole can affect the way you share a project experience?

R: Yes. If you are running software implementation project, and it got connectivity issues, you can't do anything. So if your services are sitting in one country and your team is sitting in another country- and connections are wrong, you need to move the whole team to the same country. So yes, all of this impact a lot. This also applies to teams that are on the same site. I mean if you send an email as a proof of something, sometimes you got solutions and its too much for people to write down and you get in on email and the email is down. Its difficult so it takes up a lot of time because then you have to go to that person back to write down everything and they will get back to you, reconfirming that I wrote it down the right way. So even if you are sitting on site, its also an issue if its not there.

I: Ok. So you actually think that all these tools have a place in the project management world?

R: Yes, definitely.

I: Ok. My final question would be- whether you think that the ICT industry as a whole can contribute to the sustainability of the economy it is involved in?

R: I don't know if its in a country as a whole but if you think about it- depending on your project managers- If you think about construction, if you don't use your information technology systems, the road can take up to seven years to complete if the communication is

not there. So it depends on your project. Just imagine you are in a hospital war and you have lives depending on you- if you don't have your communication channels and your systems in place, they might have to move the people to another war. I think it depends on the project and the involvement from the country. So in our instance, if our systems are not in place, it could affect Econet revenues and the way that they go forward- ultimately impacting the country because the smses are not going through, the systems are hanging; when you are trying to make a phone call, all of the sudden it drops and you had a critical call you needed to make. So I think in the essence it does contribute contribute.

I: Alright. This is it. Thank you so much.

Interview 9:

I:all right thank you Niels- or Paul, thank you for taking the time to participate in my research. So my first question: how many years of experience do you have in this sector- IT project management?

R: I have done PC species before but my main experience was seven years here at Wits, I was the project leader to put in the HR ORACLE system. Then I went to Pretoria University in 2007 and I got a similar project there, also Oracle product but the people soft system. Specifically I have been involved in the implementation of the HR system.

I: Ok, that's interesting. And you only worked in the higher education sector? Have you worked in any other sector before?

R: yes, I worked in the mining industry for about fifteen years. And I was more involved in HR and training in those days. People go funny routes with their careers. My original qualification was a BSC in Math and IT. So I always had been really interested in that field although I never really worked as an IT professional. I 've been more a user of an IT system…

I: Whoo that's a huge change. Ok, I would like you to describe to me a specific project you worked on by specifying the project duration and the team size.

R: ok, let me start with WITS. When I was working at Wits, I was brought in as a consultant into the HR department. The old IT system they had was very old and the initiative came from the HR side rather than from the IT department. They decided they want a new system so the HR director brought me in to do some preliminary work and my first job really, my first part of that whole project was to specify at a very high level the requirements of what HR system was, what kind of use to they want to make out of technology, what kind of prime things they wanted us to deliver…

I: So it was basically about installing hr system that would track hr related matter?

R: Yeah, that stage it was just determining what the requirements were…where we started from. And like I said it was at a very high level- details, system requirements level, it was just on functionality. You know a system that can run a payroll, manage leaves, appoint people, track people through their careers, performance management, do recruitment, etc..it was at a

very high level and each of these areas some of them have expectations that the HR department would have all the system.

I: Ok, was it the same thing you were doing at University of Pretoria?

R: Euhm, I will get to that because it was a different approach. Once we got through that high level.I did it basically on my own. I interviewed HR people, I interviewed deans, head of schools, etc. so I spoke to quite a range of people, it wasn't just the HR people- the kind of things a dean or head of school would also want in the Hr system. Once I have done that, I then involved on the process of what vendors out there can meet those kind of requirements. Because I was in–discussion with the IT director and it basically said :''find the best HR system, never mind if its an ERP system, or …finance or student administration those kind of things. He basically said, go and find the HR system. So that was our focus, we looked at quite a large range of vendors from very small local vendors that concentrate just on HR system to much bigger international ones still specific to HR and of course the big ERP, the ORACLE and the SAP. About the time that we decided to do that, the university as a whole decided they wanted to renew their system, not just the HR system. So the finance people and the student people also started at looking at what systems to upgrade. At some point of time, the university decided they only wanted a single vendor for all systems so they narrowed it down. So there weren't many options other than ORACLE at that stage. SAP has got a very good system in HR system and finance system but they actually….so it was really ORACLE product that we had as a solution. So yes that project ran its course and it wasn't just me, it was other people as well, in other departments. There was also a parallel process to that, to choose consultant partners, they were going to come and work with us in the implementation, and Dataconsulting from India, the ones that were selected to do that. Once those contracts with ORACLE and the consultants were signed, we then went into the more serious implementation phase. And within the HR domain, there were two of us who kind of head it up because- a team leader from DATA from the consultant side and I was the functional HR team leader. So the two of us worked in parallel. I had a small team of WITS people, mainly they were people who were in and out of the project because they had other jobs to do, and I was full time on the project. On the consulting side we had, it was about five consultants working on the HR system. I think it was three on the payroll, maybe five. Then we went to the implementation phase which was basically taking the initial specs that I have done at the very high level, detailed level then we do a kind of gap analysis between what the system provides and what require without any customization and we were very…. And you see if

you can change the requirements, you know that kind of things fall together. Always a few gaps, before we decide what customization to close those gaps. And then we go through the whole thing to see the…old system, training people on how to use the new system and so on.

I: But the switch from the demand to change the HR system of the whole school, how long did it take to actually set up the system for the whole school?

R: At wits, we did it very quickly, partly because the old system was very old. It didn't have a lot of functionality in that so we tended to do a fairly vanilla implementation of the Oracle software. It took us, from when we first started to when we went live; I think it was about eight months. There was a lot of work we did after that…but that was about when we did the first stage of the project, implemented HR. so that just a run. Pretoria University was a bit different partly because their old system was a lot more sophisticated than the old system here at Wits. But the technical platform on which they were built was very old. So the decision to put in the new system came from IT not from the functional areas. Here it was driven by the functional people because they said the old system didn't meet their needs anymore, they are behind, they didn't provide functionality that's required, etc..So the finance people, the HR people, the student people here wanted a new system. At Pretoria, none of those people wanted a new system. The old system from a user perspective was doing what they wanted it to do but from the IT perspective the technology platform was very old and that needed a complete change. So in a sense, the functional users were not very happy about this new project which brought a whole lot of different dynamics into it. Because of that the whole project has always been very IT driven and certainly from the HR point of view, they didn't really take much notice on HR, except the student system, its major requirements on the university- that's the system around which is called business revolved---- it's a fair enough conclusion to come to. So they went out to find the best students system that they could get and thenwe just had to take whatever HR and finance systems came up with that student system. We also ended up with ORACLE. But Oracle got two products that they sell- one was the original product which is called the E-business suite (EBS) and about eight-ten years ago, they bought [people] soft which is another whole ERP system and it's the people soft suite that has got the very strong student system . So Pretoria University put in their people soft system. So although they are still Oracle products, they are different products for Wits and Pretoria University. So I went there to implement the HR people soft system –by the time I got there, the decision had already been made as to which system to use and there was no requirement analysis system.

I: So you actually went quicker than…?

R: Well at the end we didn't.Because we also started a bit like here- we worked with different consultants as well, local SA consultants because they had a lot of experience with the people soft. We also started off by doing a gap analysis and because the existing/legacy system was quite sophisticated, the gap between the legacy system and the people soft system was much bigger than the gap here and it took us a long time to do that analysis. So from when we started to when we implemented it, we started in about June or July 2008 and HR was just the first system that went live in the beginning of November 2009. So it took us over- sixteen or seventeen months between when we started the project and when we went live. That's what because we spent much time doing customization and there was a lot more data new system and data migration exercise was somewhat more sophisticated that the requirements here. Yeah there were a whole lot of reasons as to why it took a whole much longer.

I: Ok-So we have two projects you just described to me. During these projects did you actually use any social media tools with regard to helping you implement those projects?

R: No. I mean we used email all the time but it wasn't specifically used for it. The consultants used Ms Project. They did it in a sense to get an overview of what was going to happen. But we didn't really track on a week by week or month by month basis- we specified milestones and we basically tracked the project by milestones. So we had weekly meetings and then we go through all the different milestones- what have we done, how much further is this still going to go, how many problems we had, etc..

I: So it actually makes sense because you guys were having face to face meetings- it wasn't really like virtual teams so you didn't really need to use these tools. So like emails or Ms Project that you mentioned, what purpose did you used them for-communication, exchange of information?

R: Not really- certainly with the tacky ones, the guy that was…the consultant team leader and me. He was the one as a consultant who had a MS project plan and it had the major milestones and those broken down and he tracked that. He would be able to say this is 25% or 32% completed or whatever the case might be. But I think for the rest of us on project team, we tended to not work on the details but at a slightly higher level. So we knew that there was data migration that we had to do for example and we knew that within the data migration there was various kinds; there were personal records, job records, leave records, payroll

records, etc..That had to be migrated.Soour technical IT people who did the data migration, the university and consutant did all the mapping between the fields and the old system and the new system and they did a few dismigration to see where how the data went to and they would push all the data through the old system and we would it test it then to see how it looked and we will find it live to push the same program into the new system.

I: So it was mainly for project update and maybe information exchange between you and theother consultants?

R: Yes. I mean like I said we had an overall plan that we could work from.

I: Ok. Whenever you encountered challenges like the one with the vendors at Wits, did you go to someone for advice about it or you referred back to some kind of repository you had to use knowledge from past projects?

R: yes, there was all kind of different ways depending on what the problem was. You know – you do the gap analysis and you are trying to figure out when the system does things like this, I would want the system to do like this and how could we bring those two things together? Often one would start off by having a meeting with the functional people and the consultants. The functional people would say:'' look this is how we've done things here'' and the consultants would say this is how the system can work and they would say we can live with that up to this point but this particular thing we must have and it's not in the system. So what I'm saying is that we would have that kind of problem solving meeting between functional people, data consultantpeople and consultants. Then what the consultant will quite do istheywill go away and investigate and the data consultant has a huge international network and as a consultant they have a massive database of information. So they will go and look at their own resources, they will look at Oracle because Oracle also got a huge database system- you can go and see what other people have done and how they resolved issues. So they will phone their buddies back in India or Pakistanor California or wherever they happen to be working because they had that international network. They were quite amazing like that because they would come back to me the next morning and say: Paul I think we have solved the problem. We can do this and that and that.

I: So they were very helpful in consulting other people?

R: Well they were just tapping in their international networks and database and find out how other people did before and come up with a proposed solution.

I: But what about you, have you ever shared information or your knowledge by any meanseg presentation, articles or via database with a colleague?

R: Oh, yes, I do that kind of stuff all the time. I used to use Oracle. I continually read on websites about technology and HR. I attend a lot of conferences both local and international, delivered papers on some of those conferences so one does keep in touch and share information that you got. I must admit I never really used social media to do that. There is a LinkedIn site that deals specifically with HR technology that I follow very closely and I very seldom contribute much to it. I look at it on a daily basis to see the discussions, who posted what.

I: So do you think that LinkedIn is not really helpful within the project management context?

R: I haven't used it in that context. I've used in terms of keeping tracks of trends in the industry more than of managing a specific project. Neither my functional team nor my technical team never really kept into traditional kind of social media but maybe its just because they don't operate that way- I certainly don't, I wouldn't. if I had a particular problem that I wanted to resolve, I haven't yet sort of looking into social media to find the answer to it.

I: ok. This is my final question. Although you said you don't use social media, I will generalize my question and therefore I would like to know if you think that using IT can affect the way you share a project experience?

R: I think I would use it-to answer more specific questions. For example at the moment we are busing implementing a whole performance management people soft there at Pretoria and we have various questions about doing that because there is not a lot of people that have done a lot in South Africa and through various networks, contexts but also googgling and Wahadoo, we discovered a few companies Multichoice here, that have the same software and done something on that. Then we went to visit them. In terms of running an actual project, the kind of projects that I've been involved in is used so said earlier, has always been very confined and based in a single place. I don't need social media to make contact with any of the people either here or Pretoria that have been involved in a project because we all work in an open space office and the other guy will just be sitting over there- so we don't really need to use any other tools to communicate. I think if there is much bigger project that's been done on national or international level; we would need to do far more of that. Like I said, those

little problem solving groups that I got together, Icould get those together within ten minutes if I needed to- the HR people are two floors down from us and all the consultants, IT and functional experts work in a open plan office so it was very easy. In a project environment like this implementation issue, you do need to make decisions very quickly.

I: Any other thing or information related to your experience as IT project manager sharing project experience that you would care to share?

R: Nothing that comes immediately into mind. Well its not within project management but we are beginning to use social media more in functional areas like recruitment for example.

I: Well, thank you for your interesting input Paul.

R: You welcome and good luck with your future studies.

Interview 10

Interviewer: Thank you Jace for joining me today. Shall we start?

Respondent: Yes we can start.

Interviewer: Basically as in the information sheet, I am investigating the role of social media usage and knowledge management practice in the success of ICT project success. Since I already know in what sector VODACOM is operation, my first question is how many years of experience do you have in such sector?

Respondent: It project management?

Interviewer: Yes

Respondent: On the project management inside is 5 years but in the IT telecommunication- 20 years.

Interviewer:Whaou, that's amazing! Do you think that your experience might impact the way you guys run your projects?

Respondent: Most definitely. I mean if you don't have experience, you are going to have to pick up issues with projects and you are going to get stuck in with the way the project is going. So with the experience that you gained over the years will definitely help you with regard to your projects and the problems that you pick up.

I: Ok. And how long in average, looking at time and cost, does it usually take you to run a project?

R: Ok. With Vodacom and……, the company I work for, we are going on a year to year basis on a financial year. So most of these projects are based on a financial target so its like 12 months project –based. If the project is not completed for whatever reason, it then carries all over to the next financial year. But it's very rare.

I: Ok. And how many are usually involved in- like the team size?

R: on the project or just the company size?

I:let's choose a particular project you recently worked on- I would like to have an idea on the number of people who worked on it with you, for how long and the cost.

R: Ok. If you take a normal project, you look at all the people from the financial and commercial side; you are looking at about +/- 30 people. Your cost average is about R250 000.

I: Alright. I am sure not all projects go within time, cost or scope. So what do you think are the main factors that might restrain the project from accomplishing its objectives?

R: The main factor with project is people-involved in projects. You get a chain of people. For example you have your commercial side, your financial side and the actual people running the project from the ground. So in between the communications between the various departments, the project I am currently dealing with now, the major concern is the council. You need to get approval from council to start a project. The delay is between 6 weeks and within the…. It can be 6months. So the main delay is currently…

I: Stakeholder's expectations.

R: Yes.

I: Ok. It's given that communication is mission critical to project success. So according to your experience with these projects- have you ever used a particular social media tools during the course of these projects? If you did so, which one in particular? I am looking at communication or collaborationtools and whether they did have an effect on the project outcome in terms of time, cost and functionality?

R: Look, when you get a project…., the IT division works along with the project division network. So on social media you will see a lot of advertiseme they know about the id, nt…people with smart phones would want to know the speed of…from 3G to 4G. so these projects are usually get …by the effect the information to people- this is what we are doing. And they know about the…they either they read about it from social media networks, or advertisements or oversees. So definitely it assists on projects with regard to getting them done quicker.

I: So basically, you guys, mainly use social media for advertising purposes?

R: Yes. Because look- what we do is telecommunication support generation network which is long term revolution. So basically what it tells you is the next generation of network and the fact that we advertise it – you can see all the service providers advertising the LG which is long termrevolution and we rely on that when we are doing the network project update. You

say: Ok, guys, this is what we will be doing, and this what is going to be for customers and benefit the rest…

I: Whaou, that's genuine, very different from what I've heard from the IT side. But then, how often do you use social media- I mean during the project, do you even have time?

R:Look, most of that is done by our marketing department. So basically it adds like a lot of….for our project department- so they will simply be during the marketing or advertising- probably once or twice annually depending on what the budget arranged for that is.

I: Alright. And how do you as a project manager can leverage social media usage to create effective communication between you, team members or stakeholders?

R: Yeah, this is exactly what I was trying…. When you advertise on social media, you are putting all the… if you don't complete the project on time. For exampleECSA at the airport- compared to internationnaly, when people land in South Africa, they need to have…generation network, what they experience overseas, so we use that as leverage to get approvals and get our project going faster. As you find out the stakeholder is a major delay-it then helps us on approvals from the various stakeholders, either it's the councils or the property owners-…….

I: Going back to a recent project you've worked on, have you ever consulted other people for advices whenever you encountered challenges during the project execution?

R: Look, what we do for all projects- because our projects are running right now from 2009 to 2012, it's the project management company…..so basically we got all the tools, skills and knowledge and if there is a problem, the various PMs and program managers that we have- we obviously have to schedule regular meeting to identify any issues and during these meetings we have to come up with a solution like: Ok, fine this is what we are experiencing from the project, do we continue with this one, or do we… and start with.something else. I think all the meetings are monthly with the various stakeholders to evaluate all issues.

I: Is it a formal meeting kind or power point presentation like?

R: No, it's a formal meeting.

I: Ok.And then, you told me that you are personally involved in sharing your knowledge with others- but in terms of knowledge reuse, do you have some kind of repository systems where

you can go back to whenever you need to access past experience or projects done that you can use in your current project?

R: Yes, when we use project management- we use [project schedule and stuff and what we experience in the past so we got a database that is communicated by all… all the information is kept on the system.you know- that's…….so basically we load it on central database…so basically if you want to go back- its like ok, we had that project, we are experiencing this- how does it help us to…avoid or how does it help us in our future projects? So basically we have a knowledge management systems.

I: As a project manager, what do you expect from knowledge reuse within the company, not specifically for a project?

R: Look, the knowledge that you gained from this, you are not going to use it for project management only- its going to be used widely in any company. when you are going to company now, you will find that project management is always a separate entity on its own and its pushed on one side and survival of that always depends on the rest of the team on the management. So this knowledge and skills will help you and think company to say" you know what, project management is not a separate entity, it should be built as part of the company and at the end of the day it should be a division within the company and run together with any other…you guys have within the company. It can be a separate entity but we got to include in the company budget, and involve it in meetings because if you don't do that it tends to have…..

I: Alright. This is really helpful! Now about the constraints you might have encountered in sharing or reusing knowledge from projects, what do you think are the major factors that influence your sharing of knowledge during the project?

R: Time is definitely one. Most projects work with time and if you don't run within time, your project is lost. Because if your losing time, you are lost. So if you …your project schedule for –for example …….if you don't achieve it by then, its basically a …if you haven't achieved and it seems to run out of delay, and others are……outstanding projects to carry over the next financial year. What is does it's a constraint of the budget again- for the company as a whole to help those funds be allocated again. Although its there-because remember when you look at project funds, its not actual money but its just the funds….so that will be the major concern. Yes, the time is delayed if you don't meet the project and also in

big companies, Vodacom for example, the major thing there is- although you are running a project , you are also relying on other project managers in other departments kind of field projects….for example equipments- your project is going to be… so your reliance on other PMs in other departments is also a big concern besides time.

I: Ok. We often hear about the boundaries between social life and business, especially associated with the use of social media in the workplace. So do you think that using these social media tools can affect the way you share a project experience?

R: Look, I think if you look at social media and sharing experiences, you wonder IT and you wonders project management, you will see a lot of them sharing ideas and issues about project management. Its good because you are going to have an open communication and discussion and each project is totally unique and every person experiences it differently and its better to have more than one answers to itself different issues they may have. So it's a good thing to have it shared and you learn a lot from them. I think im more open…sharing information about PM…its very helpful,I guess at the end of the day- because you have to share it, its not going to help you keeping it for yourself.

I: A big company like Vodacom is classified in the telecommunication sector. Such sector is seen as the fastest growing sector in South Africa. So I want to know how Vodacom is receptive to change, how do you deal with innovation within the industry?

R: As a telecommunication company… you can buy an Iphone now- the 6th is coming up. So as the telecommunication company and IT company based, it's a service provider. What they do, they have to keep the best with the changes and they got the idea , they are very adaptable with that regard because if you don't you will become non-competitive especially when you are competing with a big like MTN, Cell-C, Telkom Mobile and you got the international based who also want to be…as well . so as big a company like Vodacom is, they are very adaptive to change, they are constantly looking at…….looking at various what happening and make sure we are one step ahead of the others.

I: Great! This will be my final question. One main challenge we have in Africa in general and South Africa in particular is electricity. So what is the contribution of Vodacom towards sustainability in South Africa?

R: if you look at Vodacom,right now they are busy with various projectscurreyntly with Zedox-where they are trying to use the old power with innovation ….which contribute

obviously to electricity usage nationally. So they are moving towards a greener sort of way of operating…

I: Yes but everyone is saying that…

R: Yes, they are doing it- I think MTN already has done that- Vodacom is busy doing it, you will find out that FNB is doing it as well… they are moving….its a positive effect. Although it is costly its something that they need to do.

I: Ok but you are saying it as if it wasn't really a personal commitment from the company but rather more of a corporate social responsibility.

Interview 11 telephonic

Interviewer: Good morning, am I talking to Sbu?

Respondent: Yes, this is me. You are just on time for our meeting.

Interviewer:[laugh]. So shall we start?

Respondent: yes, we can start.

Interviewer: so just to quickly brief you, it's going to be a 15min interview. It will be gathering your insights based on your experience with social media usage and knowledge management in the ICT project management context. So my first question is could you give a brief overview of your job description at ORACLE South Africa?

Respondent: I am the consultant for Southern Africa operating through SADC.

I: Ok. And what sectors or industry types do you usually provide these consulting services for?

R: All sectors- all industries.

I: Ok. How many years of experience do you have in that particular sector?

R: I got-combined it's about twenty two years of experience.

I: Whoa. It is said that'' project managers spend about 80% of their time communicating''. Do you actually agree with such statement?

R: I think so, yes.

I: Ok, as a consultant operator, can you think of an IT project or any IT solution you recently worked on by specifyingthe duration and the team size?

R: Ok, I'll tell you the big one thatwe are doing. It on MTN. but I'm not sure if it's the one I should use here as an example..

I: Yes, of course, ICT also covers the telecommunication industry.

R: Ok. So I've got MTN that's going to run for about two years- I've got university of South Africa (UNISA) done over a year and I've got center for…its in Mozambique –that's running over two years. We are implementing a test solution for the Mozambican government.

I: Ok. What about the team size, are you working on your own?

R: No, no, the team size differs. At MTN, I've got a team of very experienced architects- I think we got a team of about 11 people- 15 if I count the two program managers and their project administrators. And UNISA I got about 10 people as well on site and another 5 offshore. In Zimbabwe, I've got about- offshore I've got five. In total its also about 15 people: the project manager, the operators and myself.

I: Alright. Related to your experience in these projects, have you ever used a particular social media tool?

R: We haven't. but we are going to use them on the test project. We haven't used a project where we use social media tools. However I use videoconferencing all the time to communicate-remember we have team members offshore. We don't use social media because we got other systems here in Oracle- there is one called Pegant; it works almost like whatsapp. Its not on the phone, it's on the laptop. We use that one most of the time to communicate when we are in the office. We sometimes use Watsapp outside office hours when there is a real need. Even when you get home, you are still logged on-so you communicate via that or via email.

I: and do you use any particular tool to exchange information among team members?

R: Yes, we do. We've got database that we use at Oracle- Knowledge Management database. Its called Beehive – we store all the information and all the …

I: Ok. Do you think that using these tools is actually helpful in terms of the project outcome?

R: It is helpful in terms of communication with the project team and sometimes the customers. In Mozambique, I also use Whatsapp to communicate with the project sponsor from time to time.

I: Interesting! During these projects, have you ever recalled experience or knowledge from past projects or consulted someone else for advices when you were faced with a challenge?

R: Remember with a global organization or global company, there is always someone who has done something similar. We got a core team of architecs for our region and in different areas as well so if you encounter any problem- say technical or technological, you know who

to talk to. You send that person an email and if he cant help, he sends an email to the wider community to find out who has had similar experience.

I: Ok. What about knowledge reuse? Do you have a repository system where you can access the information you need for your actual project?

R: Yes, like I said, we have adatabase-Beehi where we store all the documentation concerning project proposals and that. So you can edit as a member all the information so we reuse. Some projects we don't start from scratch so we reuse- we got a methodology that we use called USM-universal methodology. So we follow the methodology- most of it it's reused from previous projects.

I: That's great! And do you actually think that going back to the past experience or projects, is also helpful in terms of project objectives in particular?

R: It is- because if you don't start anything from scratch, you take from previous experience-also recall… and we say, you know next time the project manager would write some advices-next time you got a project like this look out for this. At the beginning of the project, you make sure you are at the dot side of the row….in the run of find the project itself.

I: Ok. But what about you Sibongile, have you ever shared a project experience with someone inside or outside of Oracle?

R: I can share projects that I've done outside of Oracle. You know here at Oracle, I ;ve managed projects-I'm not really involved, I'm more like project executive going to project or board meetings. But because of my project experience, I pick up and know these projects, where they are- they update me. When there is an issue, then I need to take out with my counterparts, the project sponsor or the project owner I do that. We communicate via power point presentation. We are not going to …meeting or even get to that a week before the….meeting, there is a presentation that the project manager must prepare and upgrade me on the…effects cause sometimes …the project manager- I know where they are with the project, with the issues, I look at the issues log, I look at the risk logs, then I can advice moving from there and when we go the …meeting, all these advices-what to say, what to tip on the presentation and what not to communicate to the client. Its not that kind of meeting; this is where they should……so yes, we do a lot of presentations.

I: Ok. Given all this information, do you think that using IT in general can affect the way you share a project experience?

R: It does. Nothing beats documenting- nothing beats documentation because you can always go back. You know everything that you do. What we don't really do is which I think is sometimes a problem, is some form of formal communication where you know you have a word document then you send it to the client and you say….meeting. you mention the wordcast – you have meeting with the client via webcast or via conference call. After the call, we set up an email and we say this was the agenda and this was what we discussed but we don't put it in a documentike in a word document and we send it via email- which I find it easy for people to read.

I: So you are actually confirming that IT, not social media in particular, has its place in the project management world?

R: It does, it does have a lot of place in the project management world. You know when you find that our customers have not taking up- the one that I mentioned in Mozambique, as much social media so we use emails to communicate.

I: Alright. Final question: Do you think that the ICT industry really can contribute to the sustainable development of the community or the economy it is involved in?

R: Yes, I do. One example you can use is the internship we offer for our graduates. 2- will be the development of SMes- we have a program where we develop SMes and 3- we got what we call a partner channel- so those people are reseller with Oracle and we do training for them on Oracle. We do enterprise development. We give them support [to Smes] when they have projects. I have to give them support to deliver those projects and another division will give them support on how to run their business, how to do their financials, how to do their speeches- you know.

I: Well that was my last question. Thank you for your input Sibongile.

R: Of course, anything else you need give me a call.

I: I will. Thank you so much.

R: Alright, bye.

Interview 12

I: First of all thank you Barry for meeting with me. Just very quickly, can you tell me a bit about your job description- what is your function here at Econet?

R: Econet Wireless International… we have our group head office here in Johannesburg. We have operations running in Zimbabwe, our biggest operation. We have another operation running in Lesotho and another one in Burundi. So we have three wireless communications setups and we have a landline setup in Lesotho as well. So that's just one of our business entities. We have Econet solo which is a solo entity, we have soloway which is product that develop products; we got water purification so we are basically in substances and we are thinking about the future. So that's where we sit. But my specific job description is group programme manager. I manage the projects at the high level across the group. I have a number of project managers that work underneath me. They have to deliver on those projects. So basically I am at the head level. I just basically take the information and feedback to the rest of the group.

I: Ok. What kind of corporate clients or industries you provide these services for?

R: we provide services for pretty much everyone. Because we are telelko, we basically supply telecommunication services for where I am focused, telecommunication services to those we have these specific operations. We have six and half-6.5 millions clients in Zimbabwe, we have about three-3 millions in Burundi and Lesotho so we got a lot of clients ; we are basically in telecommunication space to customers like yourself.

I: Ok. And how many years of experience do you have in that field?

R: Currently I have one-year experience in telecommunication and in project management and delivery; I have eight years of experience.

I: Alright, that's interesting. A statement says:'' Project managers spend about 80% of their time communicating''. Do you agree with this?

R: Absolutely, I do. I know that most of the time we are sitting in meetings with a lot of team members. When we are not communicating verbally, we communicate over the phone or feeding back to other stakeholders so most of the time we are communicating to someone. But 20% of the other time would be breaking communication which we had to submit

answers but pretty much I would say probably more than 80% so I will agree with that statement.

I: Can you think of a specific project in your field, that you can describe to me by specifying the project duration and the team size?

R: Currently we got a few projects running. We got a project which is just finished- my colleague is wrapping it out. She is in a close entrepotfor a project which is influencing all of our operations. It is at the group level which it's about five and half thousand people that were influenced by a business process change that we did internally. And the project ran for three years.

I: Three years? So it is since 2010.

R: Yes, since 2010. The research was done prior to that so possibly six months before that.

I: Relating to your experience with such project or any other projects, have you ever used a particular social media tool?

R: Well at the moment we are using a, not specifically a social media tool but a tool that has a social media area within itself, it has a basic status update area. It's a project monitoring tool and it has an area where we have to update the status of what we are currently doing so in a way, that is social media. We don't specifically use a Facebook for communication. We do use SKYPE and LinkedIn that is something that we use internally to basically understand how the market is playing.

I: Other than the tools you just cited to communicate, do you use any other tools to exchange information between team members?

R: I suppose we wouldn't. We normally just call each other- we are working in a telephonic environment so we normally call each other. We use skype like I said; we use Watsapp- text messaging. So that's what we kind of use as a standard, I would say.

I: Do you think that using these tools can have an impact on the project outcome- whether it is in terms of reaching objectives or in terms of reducing time and cost?

R: I do think, obviously the more time spent on communication and the more communication channels are really important. So the more communication channels that is out there and that you can use, will benefit you more in moving forward. I know that we haven't specifically

used additional social media time to integrate into our business but it's not our core focus. Our core focus is obviously not getting people onboard. We have people delivering what we need to have them delivered. So I know that some of the products that we do offer to our clients is on the social media side so we do offer lot of additional facebook –that sort of thing as data bundles- which is not quite what you are asking but we do use it for our clients. We don't use it internally to monitor and manage our projects.

I: ok. But you guys also use collaborative tools like Sharepoint or Microsoft project?

R: Absolutely. We do. We use Sharepoint, Microsoft project; we got a tool called Perpetrator –all our documents are loaded specifically on there, which is visible to the people that we have internally and theres few other tools that we have.

I: Ok. I understand you have specific tools to communicate and collaborate. Still relating with your experience using these tools, have you ever tried to recall past experience from past projects whenever you encountered a particular challenge or did you actually consult other people for advices?

R: Absolutely, I do that regularly. But fortunately because I've been in the industry for quite a while, I got a lot of people I can rely on for additional information so what I do is I consult them-especially specifically for our business, there is many people that you can talk to. Obviously the more people you talk to, the better opinion you can have because you got a diverse opinion so yes I constantly communicate with people outside as well as internally about challenges that we might face. Going back onto other projects, yes we always have a lesson learned so having a look at the lessons that we've learned from a previous project will enable us to do better next time we are doing something similar. So we keep fold on these lessons from previous projects.

I: Ok. I was actually assessing your knowledge reuse and knowledge sharing practices. Do you think that these practices are helpful in terms of project outcomes or performance?

R: Definitely. There are so many things that I may not have learned on a project but I can gain from previous people experiences. its not the same type of projects you always getting involved for the second or third time . you might be going to a project completely blind, having actually not done any of that work before and you need to rely on the other people to be able to give you the information you need to be able to be successful going through the project. So I would definitely agree with that.

I: ok. But what about you? As a project or program manager, have you ever personally shared a project experience with a colleague inside or outside of Econet?

R: Absolutely. I do that all the time. We have a knowledge sharing session regularly. Once on a Friday afternoon. We normally sit on a Friday afternoon and we do a basic debrief- what we have done this week, what we have learned and how we can possibly work together to increase the potential that we have within our team so we work our own strengths and our own weaknesses in a team and we normally do that once a week and we call that our reflection session in which we sit together for an hour on Friday afternoon. Before we leave, we discuss where we can possibly add value to each other and the project going forward because obviously we all from very diverse backgrounds. Some people are South Africans; other people are international colleagues that we work with. So it's nice to be able to share on the experience that we reach out from the different sides of the world, different parts of the business.

I: and in what format do you do it?

R: It's very informal. We actually move out of the office and we go sit in a restaurant on Friday afternoon and we sit together and discuss what we've been doing or we normally get together in a similar environment on a Monday morning and have our briefing session for what we will do that week. So we have a start to the week and we have a debrief session at the end of the week.

I: Alright. Do you think that- I wont say social media specifically- I will say IT can affect the way you share a project experience?

R: Absolutely. Because the more you get involved with this sort of environment, the more you want to share. You cant share by being on your own, so these new platforms that are being created, are giving us that additional step forward to be able to share and communicate to not only one or two people but many.

I: That's interesting. This is my last question. Do you think that the ICT industry can contribute to the sustainable development of the community or the economy it is involved in?

R: I definitely believe that because I believethe more people communicate, the more we can share knowledge with each other by doing diverse things which brings –spread to new ideas. And new ideas create innovation and innovation creates new channels of talking and new

ways of living life. So I do believe that is a critical point for us to move forward. Information sharing obviously through communication is the way that we can move countries and the world forward. We have to. If we just look at the last five years, the development in that specific industry-of knowledge sharing, communication, new communication channels, new platforms, to be able to use and to share, in terms of data- some in terms of voice activation systems, voice packages,..so many different types of innovation have come about through this specific industry and I believe this industry is driving most of the change-going forward with the future.

I: That's all great. Does Econet have any particular activities or programs towards sustainability in South Africa?

R: ok. Previously we were focused in African countries-we've only been in South Africa for the last year. We have global presence and outputs not really in South Africa. Our products arent shared with south African consumers. We share it with global consumers so most of the stuff we are doing nowis still new. But in terms of our sustainability, our focus for what we are doing, our business is to get the end users or the consumers, the everyday person out there, give them a better standard of living. So from our originator, from the person who started the business, he started off in the telecommunication field, he grew a company in telecommunication now he realizes, now that he got five hundred and fifty millions people that he's been able to contact through voice and telephone internationally, he is looking for the next big thing. The next big thing is energy and water purification. Without energy, without water, we cannot survive. So that's where we are moving to. So in terms of sustainability, we at Econet, that's where we are driving. We recently purchased two businesses in the United States in terms of water purification and development as well as rejoining with an international company in China who is developing our solar for us. So we will be able to take solar to the consumer. At the moment we got a project that is running called home house station which is basically solar energy for end consumers. We also have a product which basically takes cell phones and you can charge cell phones via solar energy in rural areas. So there is a lot that we are doing for the end consumer, specifically for those that aren't able to afford or don't have big budgets. So we are trying to move toward the end consumer and towards masses, specifically in Africa.

I: Whaou, that's really awesome, I can't wait for these projects to be implemented. We've reached the end of the interview. Thank you so much for your time and input.

8.6 MEASURING SCALES

The following scales were used to examine the relationship between social media usage, knowledge management adoption and ICT project performance

8.6A KNOWLEDGE MANAGEMENT SCALE

In order to assess the validity of their scale, Gold, Malhotra & Segars (2001) used multiple item measures to ensure that the constructs at hand are accurately assessed and that the measurement of the different variables are more consistent. The measures were derived from theoretical statements in the literature. Items measures for KM application or reuse were : '' I take advantage of new knowledge'; ' knowledge was accessible to those who needed it'.

Aditionally, the knowledge management performance index (KMPI) was used to measure the construct knowledge sharing (Chang, Lee & Kang, 2004).

Table E: Factor structure of knowledge sharing

Factor	Eigen Value	Cronbach Alpha	Items	Factors loadings	Convergence validity
Knowledge sharing	2.35	0.75	We share information and knowledge necessary for the tasks	0.88	0.64
			We improve task efficiency by sharing information and knowledge	0.78	0.73
			We developed information systems, like intranet and electronic bulletin boards, to share information and knowledge	0.72	0.71
			We promote sharing of information and knowledge with other teams	0.54	0.61

8.6 B SOCIAL MEDIA SCALE

The social media fit scale, developed by Lee, Hsieh, Huang & Shen (2012) was used. Their study presented a factor loading of all observed variables greater than 0.5, with Cronbach's α coefficient of all constructs greater than 0.7. The average AVE of each construct was between 0.71 and 0.96. In combination to this scale, the computer mediated communication questionnaire (CMC) was used for the constructs on communication and collaboration tools.

REFERENCES

Adendorff, A., & Donaldson, R. (2012). Knowledge-based service industry in a South African university town: the case of Stellenbosh. *Development Southern Africa 29(3*), 418-433.

Adenfelt, M. (2010). Exploring the performance of transnational projects: Shared knowledge, coordination and communication. *International Journal of Project Management 28*, 529-538.

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions.* Newbery Park: Sage.

Alozie, N. A., Akpan-Obon, P., & Foster, w. A. (2011). Sizing up information and communication technologies as agents of political development in Sub-saharan Africa. *Telecommunications policy 35*, 752-763.

Amara,N., Landry, R., & Doloreux, D. (2009).Patterns of innovation in knowledge -intensive business services. *The service Industries journal* 29 (4), 407-430.

Andersson, M., & Hellerstedt, K. (2008). *Location Attributes and Start-ups in knowledge intensive business services.* Stockholm: Centre for Excellence for Science and Innovation Studies.

Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2012). *Causality and endogeneity: Problems and Solutions.* Oxford: David Day.

Aslesen, H. W., & Isaksen, A. (2007). New perspectives on Knowledge-intensive services and innovation. *Human geography 89(1)*, 45-58.

Baron, & Kenny. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of personality and social psychology, 56(6)*, 1173-1182.

Bhatt, G. (2001). Knowledge management in organizations: examining the interactions between technologies, technique and people. *Journal of Knowledge Management 5(1)*, 68-75.

Burrel, G., & Morgan, G. (1979). *Sociological Paradigms and Organizational Analysis: Elements of the Sociology of Corporate Life*. London: Heinemann.

Callaghan, C. (2013). Organisational culture, individual values and research productivity, PHD thesis, University of Witwatersrand.

Callaghan, C. (2014). Research productivity and values. *Mediterranean Journal of Social Sciences*, 5(1).

Callaghan, C. (2014). A new probabilistic problem-solving paradigm: A conceptual critical reflection. *Mediterranean Journal of Social Sciences*, 5(23).

Callaghan, C. (2014). Solving Ebola, HIV, Antibiotic resistance and other challenges: the new paradigm of probabilistic innovation. *American Journal of Health Sciences*, 5(2).

Callaghan, C., & Papageorgiou, E. (2014). Resouce scarcity and information technology: issues and trends among first year accounting students. *SAJHE*, 28 (5), 1575-1592.

Callaghan, C. (2015). Crowdsourced R&D and Medical Research. *British Medical Bulletin*, 115, 1-10.

Capretz, L. F., & Ahmed, F. (2010). Why do we need personality diversity in software engineering? *ACM SIGSOFT Software engineering notes, 35(2)*, 1-11.

Cave, K. (2013). South Africa: Why are all the rural tech projects failed? retrieved from*The independent Online*, http://www.idgconnect.com/blog-abstract/2292.Accessed 08 March 2014.

Chang, L.' Lee, S., & Kang, W. (2004). KMPI: Measuring knowledge management performance. *Information and management journal*.

Communication, N. (2013). Nigeria: Concern over IT project failure. Retrieved from http://www.itnewsafrica.com/2013/07. Accessed November 2013.

Cooper, D. R., & Schindler, S. (2001). *Business research methods (7th ed.)*. Boston: McGraw-Hill Irwin.

Da silva, A., & Walter, F. (2010). *More than hope and good intentions: deploying ICT projects at the edge of development.* Australia: The Australian National University.

Dagada, R. (2012). Industry insight: SA's ICT industry in 50 years time. *http://www.itweb.co.za/index.php*. accessed 27 january 2014.

Defillippi, R. J., Arthur, M. B., & Lindsay, V. (2006). *Knowledge at work- Creative collaboration in the global economy.* Oxford: Blackwell Publishing.

Dekkers, C., & Forselius, P. (2007). Increasing ICT project success with concrete Scope management. *EUROMICRO Conference on software engineering and Advanced application*,1-8. IEEE.

Drucker, P.F (1993). Post-capitalist society, Rutledge.

Drucker, P.F (1999). Knowledge-worker productivity: the biggest challenge. *Carlifornia management Review*, 41(2).

Du Preez, M. (2007). Project management for Modern Information systems. *Electronic Library ,25(3)*, 379-380.

Duyshart, B., Walker, D., Mohamed, S., & Hampson, K. (2003). An example of developing a business model for information and communication technologies (ICT) adoption on construction projects- The national Museum of Australia project. *Engineering, Construction and Architectural management ,10(3)*, 179-192.

Esselaar, S., Gillwald, A., Moyo, M., & Naido, K. (2010). Towards evidence-based ICT policy and regulation. *South African sector performance review, 2(6)*, 1-46.

Fourie, L. (2008). *Enhancing the livelihoods of the rural poor through ICT: A knowledge map.* South Africa: infodev.

Galpin, J. S. (2012). *Statistical Research Design and Analysis.* Johannesburg: University of the Witwatersrand.

Gelbart, R., & Carmeli, A. (2009). The interactive effects of team dynamics and organizational support on ICT project success. *International Journal of Project Management ,27*, 464-470.

Ghauri, P., & Gronhaug, K. (2010). *research methods in business studies.* Harlow: Pearson.

Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspectives. *Journal of Management Informations Systems, 18(1)*, 185-214.

Hair, J., Wolfinbarger Celsi, M., Money, A. H., & Samouel, P. (2011). *Essentials of business research methods.* New york: M.E Sharpe.

Hans, R. T., & Rwelamila, M. (2012). Knowledge base of projects managers in the South African ICT sector. *Computer science and information technology*.

Horn, V., Schwarzkopf, A., & Price, R. (2006). *Information systems solutions- A project approach.* New york: McGraw Hill.

Jewel, T. (2006). *Motivators and Inhibitors to Knowledge Sharing in IT project teams.* Queenland.

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons, 53*, 59-68.

Kyobe, M. (2011). Investigating the key factors influencing ICT adoption on South Africa. *Journal of systems and information technology ,13(3)*, 255-267.

Lee, C., Hsieh, C., Huang ,H., & Shen, W. (2012). Developing a social media fit scale. *2nd International conference on industrial technology and Management*, 49 (5).

Li, X., & Ma, W. (2012). Knowledge management in construction companies in China. *Future wireless and Information systems, LNEE 144*, 313-320.

Lockyer, K., & Gordon, J. (1996). *Project management & project network techniques.* Glasgow: Pearson Education Limited.

Manly, B. F. (2005). *Multivariate Statistical Methods: A Primer.* Boca Raton: Chapman & Hall/CRC Press.

Mckay, Marshall, J., & Siddharta. (2013). Setting a research agenda for IT project management offices. *46th Hawaii International conference on System sciences.* Hawaii: HICSS.

Miles, M.B., & Huberman, A.M (1994). *Qualitative data analysis* (2nd edition). Thousand Oaks: Sage.

Muganda, N., & Pillay, K. (2013). Forms of power, politics and leadership in asynchronous virtual project environment: An exploratory analysis in South Africa. *International Journal of managing projects in Business, 6(3)*, 457-484.

Muller, R. (2003). Determinants for external communications of IT project managers. *International Journal of Project Management ,21*, 345-354.

Muller, R. (2011). Failed telecoms projects in SA. Available at http://mybroadband.co.za/news/telecoms/19289. Accessed 12 september 2013.

Murphya, G., & Salomoneb, S. (2013). Using Social Media to facilitate knowledge transfer in complex engineering environments: A Primer for educators. *European Journal of Engineering Education ,38*, 70-84.

Murray, A., Mohamed, M., & Mohamed, M. (2010). The role of Information and Communication Technology (ICT) in mobilization of sustainable development knowledge: A quantitative evaluation. *Journal of knowledge management , 14(5)*, 744-758.

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)*, 231-245.

Neilson, R. (1997). *Collaborative technologies and & organizational learning.* London: Idea group publishing.

Nieves, J., & Osorio, J. (2012). The role of social networks in knowledge creation. *Knowledge management research and practice ,* 1-16.

Nonaka, I. (1991). The knowledge creating company. *Harvard Business review*, 96-104.

Nonaka, I., & Takeuchi, H. (1995). *The knowledge creating company. How Japanese companies create the dynamics of innovation.* New York: Oxford University Press.

Nonaka, I., Dierkes, M., Antul, B., & Child, J. (2001). *Handbook of organizational learning & Knowledge.* Oxford: Oxford City Press.

Okunoye, A., & Karsten, H. (2003). Global access to knowledge- Findings from academic research organisations in Sub-saharan Africa. *Information technology & people, 16(3)*, 353-373.

Okunoye, A., & Karsten, H. (2003). Global access to knowledge-Findings from academic research organisations in Sub-Saharan Africa. *Information Technology & People, 16(3)*, 353-373.

Othman, A. A., & Sirbadhood, N. (2009). An innovative partnership framework for sustainable development of rural areas in South Africa: The role of project management firms. *Journal of Engineering Design and Technology, 7(3)*, 243-263.

Pade, C., Mallinson, B., & Sewry, D. (2009). An exploration of the critical success factors for the sustainability of rural ICT projects- The Dwesa case study. *Information Systems Development: Challenges in Practice, Theory, and Education,1*, 339-353.

Panahi, S., Watson, J., & Partridge, H. (2012). Social Media and Tacit Knowledge sharing: Developing a Conceptual Model. *World Academy of Science, Engineering and Technology, 64*, 35-48.

Paterson, A., & Roodt, J. (2008). *Skills demand and Supply in the South African ICT sector, 1996-2005.* South Africa: Department of labour and HSRC.

Patton. (1990). *Qualitative Evaluation and Research Methods.* Beverly Hills: Sage.

Pekka, A. (2010). Social media, Reputation risk and Ambiant publicity management. *Strategy and Leadership ,38(6)*, 43-49.

Petter, S., & Randolph, A. (2009). Developing soft skills to manage user expectations in IT projects: Knowledge reuse among IT project managers. *Project management journal, 40(4)*, 45-59.

Pinkowska, M., & Lent, B. (2011). Evaluation of Scientific and Practice Approaches to Soft skills requirements in the ICT project management. *IBIMA Business review*, 12.

Pinsonneault, A., & Kraemer, K. (1993). Survey research methodology in management information systems: An assessment. *Journal of Management Information Systems, 10*, 75-105.

Priti, J. (2006). Empowering Africa's development using ICT in a knowledge management approach. *The electronic Library, 24(1)*, 51-67.

Raju, A., Lindmark, S., Delaere, S., & Ballon, P. (2012). *A holistic impact- assessment framework for green ICT*. Vub: IEEE Computer Society.

Reed, A. H., & Knight, L. V. (2013). Exploring the Role of Communication Media in the Informing Science Model: An Information Technology Project Management Perspective. *Informing science: The International Journal of an Emerging Transdiscipline*, 131-144.

Remidez, H., & Jones, N. (2012). Developing a model for social media in project management communications. *International Journal of Business and Social Sciences, 3(3)*, 33-36.

Salim, I. M., & Sulaiman, M. (2011). Impact of organizational innovation on firm performance: Evidence from Malaysian- based ICT companies. *Business and Management review, 5*, 10-16.

Sanou, B. (2013). ICT facts and figures. Available at *indicators@itu.int*. Accessed 03 october 2013.

Sattar, S. (2012). Exploring Knowledge management practices. *International journal of learning and development, 2(1)*, 330-352.

Sauer, C., & Reich, B. H. (2009). Rethinking IT project management: Evidence of a new mindset and its implications. *International journal of project management 27*, 182-193.

Shenton, A. K. (2004). Strategies for ensuring Trustworthiness in qualitative research projects. *Education for Information 22*, 63-75.

Smith, D. A. (2010). *Knowledge management as an indication of organizational maturity in project management : An enhancement of the OPM3© model.*Unpublished thesis, University of Denver.

Smith, D., Bruyns, M., & Evans, S. (2011). A project manager's optimism and stress management and IT project success. *International Journal of Managing projects in Business, 14(1)*, 10-27.

Smith, M., & Elder, L. (2010). Open ICT ecosystems transforming the developing world. *Information technologies and international development ,6(1)*, 65-71.

Smith, M., & Lyles, M. A. (2006). *Handbook of Organizational learning & Knowledge management.* Victoria: Blackwell Publishing.

Sobel, M. (1982). symptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological Methodology* ,290-312.

Steinberg, J. (2003). Information technology and development-beyond 'Either/or'. *The Brookings review, 21(2)*, 45-48.

Steyn, H., Du Plessis, Y., Kruger, D., & Carruthers, M. (2012). *Project management-A multidisciplinary approach.* Pretoria: FPM Publishing.

Stolovitsky, N. (2010). Social media meets project management- Can they co-exist? *PM Best Practices.*

Stone, H., Chavula, K., & Konde, V. (2011). Innovation and industrial development in Africa. *ATDF journal, 8(3)*.

Storey, M. A., Deursen, A. V., & Cheng, L. T. (2010). *The impact of social media on software engineering practices and Tools.* New Mexico: Foser.

Strauss, A., & Corbin, J. (1990). *Basics of Qualitative research: Grounded theory Procedures and techniques.* Newberry Park: Sage Publications Inc.

Tabachnik, B., & Fidell, L. (1996). *Using Multivariate Statistics(3rd edition).* New York: Harper-Collins.

Tan, H.C., Anumba, C.J., Carrillo, P., Bouchlaghem, D., & Kamara, J. (2009). *Capture and reuse of project knowledge in construction*. Oxford: Wiley-Blackwell.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's Alpha. *International journal of Medical education*, 53-55.

Toyo, R. H. (2009). *Knowledge base of project managers in the South African ICT sector/Industry.* Pretoria: Unisa.

Trauth, E., Farwell, D., & Lee, D. M. (1995). Critical skills and knowledge requirements of IS professionals: A joint academic/industry investigation. *MIS Quarterly,19(2)*, 313-340.

Tsang, F., Yaqub, O., Welsum, D., Starkey, T., & Chataway, J. (2011). *The impact of information and communication technologies in the Middle East and North Africa.* Santa Monica: RAND Corporation.

Van Reijswoud, V. (2009). Appropriate ICT as a tool to increase effectiveness in ICT4D: Theoretical considerations and illustrating cases. *The electronic journal on Information systems in Developing countries, 38(9)*, 1-18.

Yang, L. -R., Chen, J. H., & Wang, H.-W. (2012). Assessing impacts of information technology on project success through knowledge management practice. *Automation in Construction, 22*, 182-191.

Yates, D., & Paquette, S. (2011). Emergency knowledge management and social media technologies: A case study of the 2010 Haitian earthquake. *International journal of information management ,31*, 6-13.

Zhang, F., Zuo, J., & Zillante, G. (2012). Identification and evaluation of the key social competencies for Chinese construction project managers. *International journal of project management Available at http://dx.doi.org/10.1016/j.ijproman*. Accessed august 2013

Zheng, Y., Li, L., & Zheng, F. (2010). *Social Media support for Knowledge Management.*