# The Role of Business Analysis in the Success of Information Technology Project Management

## Case Study: Dimension Data East Africa

**Uganda Martyrs University**


**Submitted by**

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## Dedication

I would like to dedicate this work to the almighty GOD and to my family for having been my inspiration financially and spiritually throughout my entire stay at the University.

I also dedicate this work to my supervisors Mr. Nalela Kizito and Mr. Cyprian Ssebagala who have always spared to guide and encourage me in the entire research.

I also dedicate this research to the Business Analysts community of Uganda, the Project Management fraternity especially members of the Project Management Institute Uganda Chapter.

I still dedicate this work to all my lecturers and the entire staff of UMU

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## List of abbreviations

| | |
|---|---|
| BA | Business Analyst |
| PM | Project Manager |
| EA | East Africa |
| CITO | Chief Information Technology Officer |
| CIO | Chief Information Officer |
| PMI | Project Management Institute |
| IT | Information Technology |
| IIBA | International Institute of Business Analysis |
| ICT | Information Communication Technology |
| EAC | East African Community |
| SWOT | Strength, Weakness Opportunity Threats |
| SDLC | System Development Life Cycle |
| XP | Extreme Programming |
| PLC | Project Life Cycle |
| SoI | System of Interest |
| ISO | International Standard Organization |
| BABOK | Business Analysis Book of Knowledge |
| MOST | Mission Objectives, Strategy, Tactics |
| PRINCE2 | Projects Under Controlled Environment |
| SPSS | Statistical Package for Social Science |

**Abstract**

The Researcher undertook to study "The Role of Business Analysis on IT Project Management Success". Exploring the role Requirements Gathering and Elicitation play in the success of IT Project Management. Studying the role of Requirement Analysis and Engineering on the success of IT project management. And the role of Requirements Traceability and Solution Evaluation on the success of IT Project Management. These objectives guided the literature review that the researcher undertook. Where it was seen, that it has been growingly becoming imperative that project managers have to have the scope right, with greater understanding of the stakeholders and their needs; if they are to deliver a successful IT solution project. Business Analysis has thus become very crucial in IT Project Management despite the fact that many organizations have been too reluctant to implement these practices despite the known advantages. The research employed a case study research design to study the 95 respondent population of Dimension Data where 76 respondents were sampled using both a close ended questionnaire and a structured interview. This was because the research was using both primary data from the respondents and secondary data from journals, pulse of the profession publication, books or knowledge and text books. The study findings revealed a very strong positive relationship between requirement gathering and elicitation and IT project management with correlation coefficient $r = 0.802^{**}$, significant at $p< 0.01$. Also revealing a very strong positive relationship between Requirement Analysis and Engineering and the success of IT Project Management with correlation coefficient $r = 0.711^{**}$, significant at $p<0.01$, And lastly showing a strong positive relationship between Requirement Validation and Solution Evaluation and the success of IT Project Management with correlation coefficient is $0.783^{**}$, significant at $p< 0.01$. The regression equally showed that requirement gathering greatly determines the success of IT project management with Beta of 0.443, followed by Requirements validation and solution evaluation with a Beta of 0.410. It was thus noted that where Business Analysis has been applied there has been a great improvement in the success of IT Project Management. It was thus recommended that more awareness among corporations should be extended to ensure more application to harness the benefits of the practice in IT project management. This in addition to having Business Analysts closing working with IT Project managers to ensure more consolidated efforts and benefits realization. The researcher recommended further research on the role of Resource Skills on IT Project Management success, the role of Business Analysis on organizational performance and the role of Business Analysis on change management.

# CHAPTER ONE:

# GENERAL INTRODUCTION

## 1.0 Introduction

The process of researching and analyzing the activities of a project for possible gaps in business requirements and inefficiencies in solution delivery is carried out by a professional or an expert group appointed to the role of business analyst. This profession of business analysis contributes to solving the solution design and implementation issues in project management by providing expert advice, guidance and leadership to the Information Technology and engineering project manager, team and other stakeholders. The business analyst takes ultimate responsibility for identify and solving problems affecting the business solution, and works closely with the project manager to analyze the existing business systems and make recommendations for improvement.

Basically, project management is about implementing change to business environment, and business analysis is about ensuring the expected quality and value of that change. Both are strategic processes that can exist independently. However, in practice they come up together as no project can be implemented strictly according to the business requirements if no thorough analysis has been carried out during the project lifecycle. A combination of effective project management and incisive business analysis creates a foundation for justifying and accomplishing the ultimate objective of adding value into business operations and definitely project success.

The process of getting insight into business operations to expose the causes and effects behind failure or poor results achieved is managed by a change expert, called a “business analyst”, the same individual undertakes to understand the Information technology requirement and the possible solution that later transplant into information technology solution projects. This individual needs to understand the current

business needs of an organization in order to identify and reconcile the practical problems and facilitate rapid change and innovation through the project manager. The Business Analyst employs a project-based approach to problem-solving and decision-making for business improvement delivery.

The role of business analysis in project management is crucial to addressing the expectations and reconciling the fears of all other stakeholders involved in the process. The project would be under risk of failure if no professional had been appointed to the business analysis role. Then the stakeholders' needs would be narrowed down to routine and so the project would never deliver results that could solve the existing business problem. Despite these realities, corporate organization in East Africa are yet to embrace this methodology of change initiation and implementation in their process management, engineering and information technology solutions; which largely remains a point of research as to why the adaption is still low in the region.

Also worth research is the fact that although business analysis and project management are closely related disciplines, many organizations often remain uncertain regarding accurate and comprehensive role definitions. Some consider the business analyst role as necessary for their projects but distinctive from the project manager role. Others perceive both roles as different but the level of distinction remains unclear and not essential to the success of their project management initiatives.

While a project manager is ultimately responsible for effective project planning, control and delivery, a business analyst takes care for ensuring the quality of the project management activities. This level of input into the activities of project management is thus the heart of the role that Business Analysis plays in the project management role. If the manager plans out and controls project implementation, then the analyst explores and measures the value of the project output. The manager determines a path to success, and the analyst then identifies and eliminates worthless activities in that path. Eventually, both

professionals work on improving the effectiveness and business value of Project management. Business analysis should be perceived as the tool to facilitate and coordinate project management activities. This process removes inefficiencies and non-value adding activities. In some way, it promotes a quality assurance approach to ensure that detailed solutions for delivering business improvement are found and implemented through the project. And the project manager will take care for the overall planning, communication and delivery of those solutions.

With the above in mind this chapter includes the introduction of the research report, the background to the study highlight the key concepts as they relate to the variables under study, statement of the problem showing the research motivation and the knowledge gap upon which the researcher intends to add to the body of knowledge, major objective which is providing the general direction of the research, specific objectives of the study which are providing the guided scope of the study, the research questions which the researcher intends to focus on, and the scope of the study highlighting the parameters of the researcher, the significance of this study, justification of the study, definition of the key terms and conceptual framework.

## 1.1 Background to the Study

According to Linman (2015) Organizational Executives and Chief Information Technology Officers have long been interested in getting the most value from Information Technology programs and projects. Efforts have been put in place to ensure that these initiatives show true commitment to value realization. This need is one reason for the increased popularity of agile project management methodologies and the growing need for Business Analysis on the project management teams.

Recent trends further show that organization that have embraced realization of value through project management are further focusing on Business Analysis to harness more value for every dollar spent on Business technology and change. According to Project Management Institute (2015) for many organizations, an effective business analysis is not yet an integral part of their project work. As a result, projects are not delivering the intended business value. In 2014, Project Management Institute reported that in that year alone only 64% of the completed projects successfully met their original goals and business intent, worryingly 16% of projects that started were deemed failures. "Inaccurate requirements gathering" was reported by 37% of organizations as a primary cause of project failure.

It is thus worth noting that poor requirements management practices are the second leading cause of project failure, second only to changing organization priorities. This research clearly shows that organizations continue to experience project issues associated with poor performance of requirements-related activities. Requirements management accounts for a significant portion of the work performed within business analysis. Today organizations that have well developed business analysis practices are dramatically improving the probability of project success, it has been found that those that do not, are seeing the costly effects (Project Management Institute, 2014).

According to Jonasson (2012) when business analysis is properly accounted for and executed on programs and projects, a number of benefits are realized; high-quality requirements are produced resulting in the development of products and services that meet customer expectations, many times purchasing organization rely on providers/ vendors or technology solution integrators to interpret their needs and offer a solution. Unfortunately most times the solutions are off-the-shelf and are not customized enough to suit the unique needs the buying organization.

Hillman (2013) further argues, that another key benefit realized when business analysis is undertaken before and during project implementation especially for IT, technology and software development projects in particular is the fact that stakeholders are more engaged in the process and buy-in is more readily achieved. Projects are more likely to be delivered on time, within scope, and within budget.

It is thus clear that implemented solutions deliver more business value and meet stakeholder needs, besides Organizations develop competencies in business analysis that are reusable for future projects. Project management consultants such as IT Cortex and American Management Association have identified common problems in project management such as lack of project management skills, scope creep, poorly defined objectives, high staff turnover, insufficient resources, poor follow up, insufficient authority given to the project managers and no common project management methods adopted in the project team (International Institute Of Business Analysis, 2015)

Based on the statistics; Dimension Data  a global ICT solutions and consultancy company has been applying both skill sets and having Project management that undertakes hybrid roles of Business Analysis/ Project management and encouraging clients to have business analysis as part of the project management team on their side. All over the Middle East and African region this advisory has received small attention affecting the success of IT project management (Dimension Data, 2015).

It is worth noting, that Dimension Data as a specialist Information Technology services and solution provider that helps clients plan build and support their IT infrastructures, network, Applications platform and Digital workplaces among others. Dimension Data applies its expertise in networking, security, operating environments, storage and datacenter technologies and its unique skills in consulting, integration and managed services to create customized client solutions. Dimension Data East Africa

prides itself on being one of the most highly skilled network integrators in the region (Dimension Data, 2015).

With the awareness that Business Analysis enables better requirement management which is very key in the success of project management of Information Technology projects. It leaves a gap of knowledge to assess the role that Business Analysis in Information Technology project management given that many organizations are still hesitant to embrace Business Analysis.

## 1.2 Statement to the Problem

While business analysis that is properly accounted for and executed in Information Technology projects leads to quality requirements, which eventually results into the development of IT solutions and projects that meet customer expectations, and also ensure that stakeholders are more engaged in the process thereby buy-in is more readily achieved. This a nutshell leads to overall successful IT projects that are delivered on time, within scope, and within budget. It is surprising that for many organizations, business analysis is not an integral part of their project work. As a result, projects are not delivering the intended business value. According to Project Management Institute (2014) within 12 months, 64% of the completed projects successfully met their original goals and business intent, not surprising 16% of projects that started were deemed failures. Worse still "inaccurate requirements gathering" essentially lack of business analysis was reported by 37% of organizations as a primary cause of project failure. According to International Institute of Business Analysis (2015) organizations continue to experience project issues associated with poor performance of requirements-related activities as a result of lack of business analysis in the project management. Yet requirements management accounts for a significant portion of business analysis. Organizations that have set up good business analysis practices have in the past experienced improvements the probability of their project success. This though clear to Information

Technology solution clients, executives are still hesitant to embrace Business Analysis (International Institute of Business Analysis, 2016; Dimension Data, 2015). With this current trend, stakeholders and practitioners in the industry will continue to undertake IT project management without due Business analysis; leading to continuation of less successful IT projects.

## 1.3 Objectives of the Study

### 1.3.1 Major Objective

The major Objective of the study was to assess the Role of Business Analysis in IT Project Management.

### 1.3.2 Specific Objectives

i. To establish the role of requirement gathering and elicitation on the success of IT project management
ii. To assess the role of requirements analysis and engineering on the success of IT project management
iii. To examine the role of requirements traceability and solutions evaluation on the success of IT project management

## 1.4 Research Questions

i. What is the role of requirement gathering and elicitation on the success of IT project management?
ii. What is the role of requirements analysis and engineering on the success of IT project management?
iii. What is the role of requirements traceability and solutions evaluation on the success of IT project management?

## 1.5 Scope of the Study

### 1.5.1 Geographical scope

This research report was carried out among project carried out in East Africa considering all branch offices that include Kampala, Dar es salaam, Kisumu, and the head office in Nairobi. This is largely because Information Technology projects and any other information technology consultancy involving business analysis are implemented in the entire region with staff from all the branch office being involved in the same and with diverse experiences on how the variables are being interfaced in the East African market and the IT industry at large.

The East Africa region was focused on because of its unique growth in Information Technology consumption. And while focus was on the region, the geographical scope engulfed the entire eastern Africa since the company runs projects based in the east African region but for the entire eastern Africa region whose current population of  is 413,558,990 as of Saturday, March 25, 2017, based on the latest United Nations Live estimates (United Nations, 2017).

### 1.5.2 Time scope

The research was carried out with review of projects undertaken from 2012 to 2017 at Dimension Data East Africa; this is because during the period the company like any other IT entities was implementing projects on industrial standards (Dimension Data, 2017). Most of the information relating to these projects is archived and accessible after due authorization and compliance to the Non-Disclosure Agreement provision of the company. However for generic literature review including professional pulse and trend analysis report the researcher considered all literature that is not more than 25 years old.

The actual research was undertaken during the time of study from 2015 to 2018; which involved analysis of the problem, proposal writing, data collection, report writing, presentation and defence.

### 1.5.3 Subject Scope

The researcher focused on Business Analysis which is the independent variable, reviewing the various dimensions in which Business Analysis plays a role in the success of Information Technology; this included digesting the role that requirement gathering and elicitation plays in the success of Information Technology project management, the role requirements analysis and engineering plays in information technology success. As well as the role of requirement validation and solution evaluation plays in information technology project management success. The researcher equally made review and understood the moderating factors that were having moderation impact on how the two variables relate to each other.

## 1.6 Significance of the Study

The researcher was able to gain more knowledge on the role that Business Analysis as a practice has on Information Technology Project Management and how this results into overall project success.

The research was and will be a basis for other students who are interested in the same field to make further research on the topic or any related topic.

Organizations especially those that implement Information Technology projects were and will appreciate the role of Business Analysis and duly apply the concepts learnt.

## 1.7 Justification of the Study

The researcher liked to research in this area because of the growing awareness about the relevance of Business analysis in Information Technology project management and the seemingly low level of adaptation of Business Analysis (International Institute of Business Analysis, 2009). The researcher liked to research in this area because of the growing Agile Project Management practices for IT and software development projects that require business analysis as part of the Project management

(International Council on Systems Engineering, 2012). The researcher liked to research in this area because of the increasing failure of IT projects even with good project management that some studies attribute to Business Analysis deficiency (Project Management Institute, 2017)

## 1.8 Definition of the Key Terms

**Business analysis**

Business analysis is the application of knowledge, skills, tools, and techniques to Determine problems and identify business needs, Identify and recommend viable solutions for meeting those needs Elicit, document, and manage stakeholder requirements in order to meet business and project objectives, Facilitate the successful implementation of the product, service, or end result of the program or project (Davis, 2005).

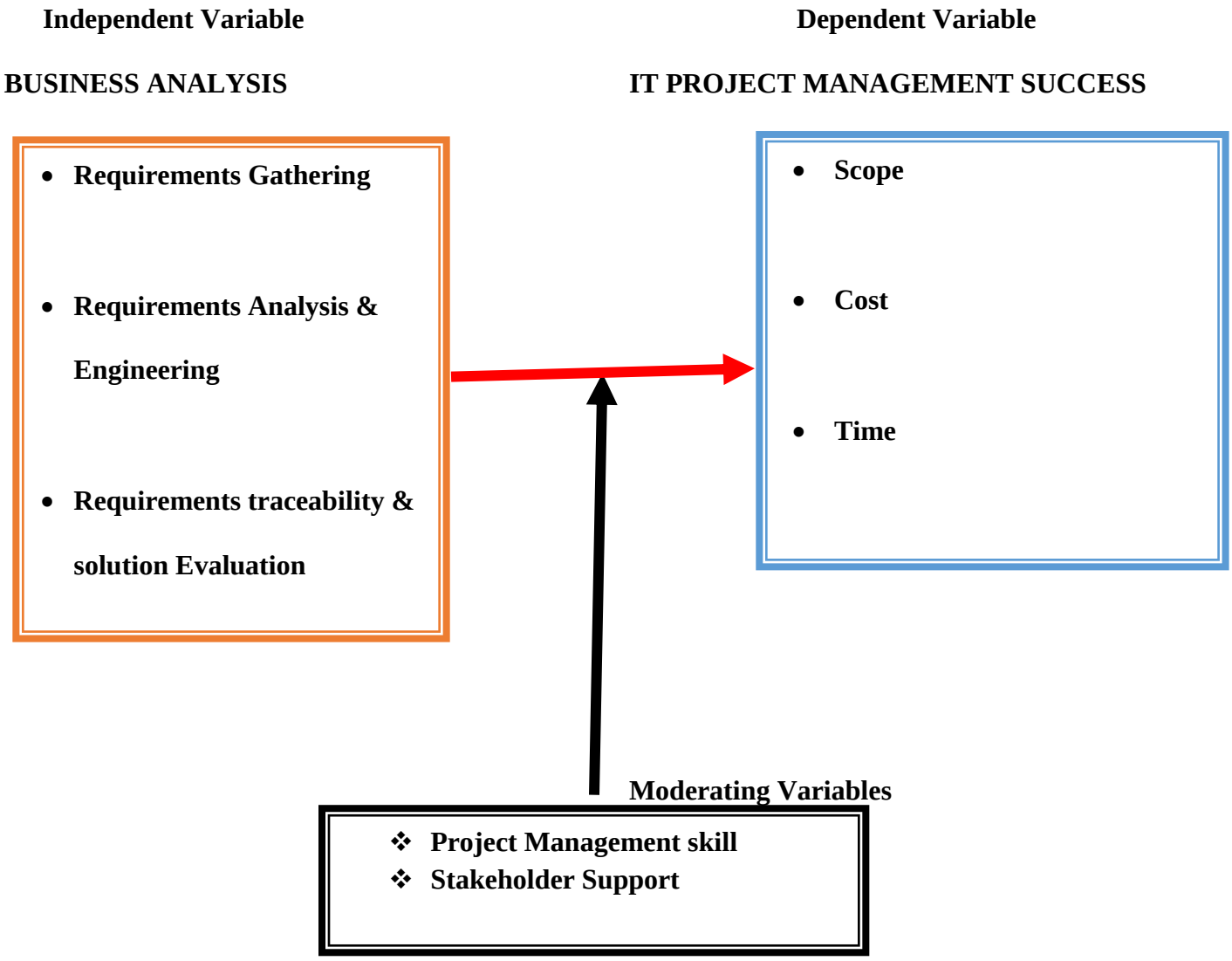
**Business analysis** is equally a research discipline of identifying business needs and determining solutions to business problems. Solutions often include a software-systems development component, but may also consist of process improvement, organizational change or strategic planning and policy development. The person who carries out this task is called a business analyst (Podeswa, 2008).

**Information Technology project management** is the process of planning, organizing and delineating responsibility for the completion of an organizations' specific information technology goals (Thamhain, 2004).

**Requirements management** is the process of documenting, analyzing, tracing, prioritizing and agreeing on requirements and then controlling change and communicating to relevant stakeholders. It is a continuous process throughout a project (Andrea, et al 2016).

## 1.9 Conceptual Framework

**Figure 1 A conceptual frame work showing the role of Business Analysis on IT Project Management**




**Source: Beatty and Wiegers (2013) and modified by the researcher**

The researcher plans to base on Beatty and Wiegers (2013) framing of how aspects of systems and business process and analysis relates to project management. The researcher thus focused on the two variables of Business Analysis; a concept that focuses on the management practices of needs identification, requirements gathering and elicitation, requirements analysis, requirements engineering

management, advanced modeling and prototyping, requirements verification and validation as well as including requirements traceability and solutions evaluation. This concept is largely applied in the disciplines of change management, process re-engineering, information technology solution and engineering. The dependent variable in this case is information technology project management. Project management is wider domain that different grossly in regards to application to words for instance Non-Government Organizations, construction, software development, engineering and even information technology. The researcher focused on information technology project management, this is a discipline of initiating, planning, executing, controlling, and closing the work of a team to achieve specific Information technology goals and meet specific success criteria as set by the Information Technology function; it thus focuses on the application of knowledge, skills, tools, and techniques to information technology project activities to meet the project requirements skewing the focus on the key success criteria based on the triple constraints of scope, time and cost.

The researcher studied the role played by requirements gathering on the success of project management reviewing the various practices under this activity including things like gap analysis, SWOT analysis and the 5 Whys analysis. Also looking at the role of requirements analysis & engineering play in the success of project management examining practices like prototyping, Brain storming, Scope modeling, Process modeling and Interface modeling. Finally the research examined the role of requirements traceability and solution evaluation on the success of Information technology project management, assessing the practices like weighted ranking, requirements verification, and requirements validation among others.

The researcher reviewed the moderating factors that moderate the level of influence how the independent variable has on the dependent variable. The factor of the level of Project Management skill is very critical in facilitating how business analysis how assist in successful project management, stakeholder support

especially top management is also critical if a project is to succeed despite the level of business analysis, and finally the level of project funding is also very critical, without adequate funding despite the influence of the different variables.

# CHAPTER TWO:

# LITERATURE REVIEW

## 2.0 Introduction

This chapter includes a review of various authors' literature on the concept of Business Analysis, the concept of IT Project Management as well as the role of Business Analysis on IT Project Management working with Dimension Data East Africa as a case study.

## 2.1 Theoretical Review

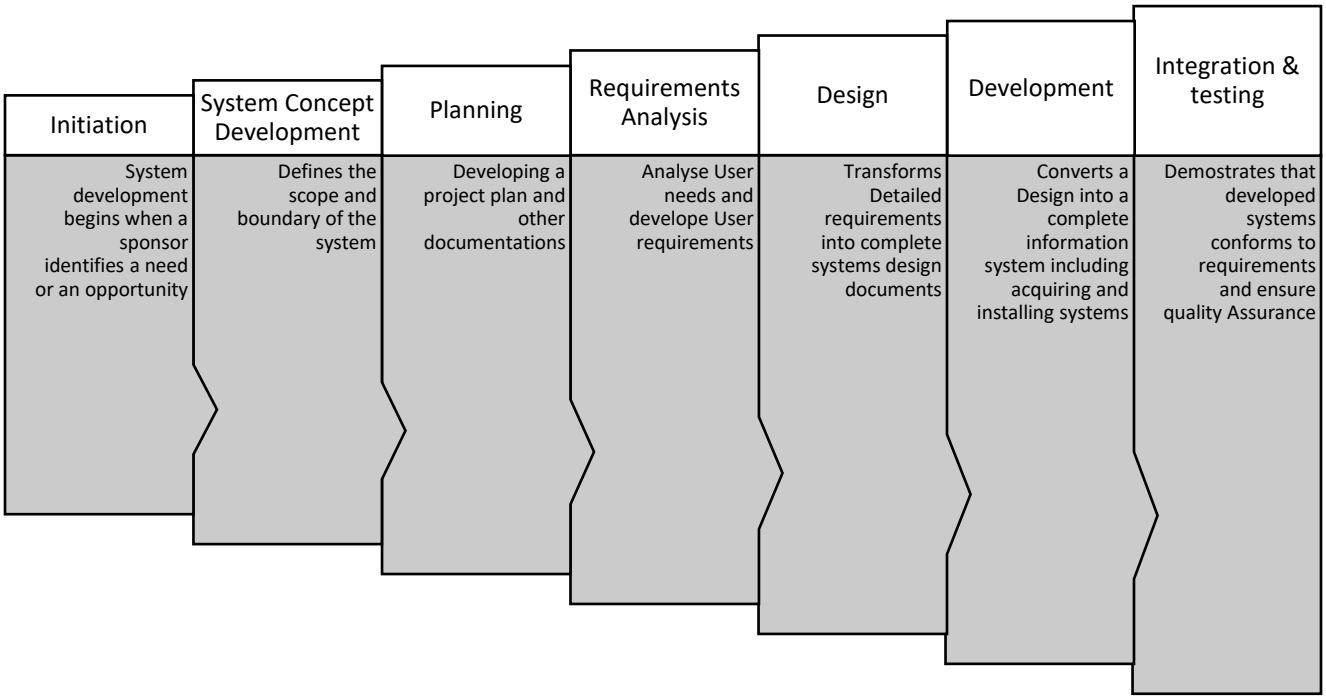
The theories and models that underlie the research under study are enshrine in the re-known systems development life cycle (SDLC), which is largely referred to as the application development life-cycle, and is a term used in systems engineering, information systems and software engineering to describe a process for planning, creating, testing, and deploying an information system. The systems development life-cycle concept applies to a range of hardware and software configurations, as a system can be composed of hardware only, software only, or a combination of both. A systems development life cycle is composed of a number of clearly defined and distinct work phases which are used by systems engineers and systems developers to plan for, design, build, test, and deliver information systems. Like anything that is manufactured on an assembly line, an SDLC aims to produce high-quality systems that meet or exceed customer expectations, based on customer requirements, by delivering systems which move through each clearly defined phase, within scheduled time frames and cost estimates (International Council on Systems Engineering, 2012).

Models that describe how business analysis and project management is done leverage largely on the SDLC which describes a wide spectrum of models and theories that range from agile to iterative to

sequential. Agile methodologies, such as XP and Scrum, focus on lightweight processes which allow for rapid changes without necessarily following the pattern of SDLC approach along the development cycle. Iterative methodologies, such as Rational Unified Process and dynamic systems development method, focus on limited project scope and expanding or improving products by multiple iterations. Sequential or big-design-up-front (BDUF) models, such as waterfall, focus on complete and correct planning to guide large projects and risks to successful and predictable results (Pew & Mavor, 2007).

Some authors including Lawson (2010) have endeavored to extract the project management component from the SDLC arguing that like project management a project can be defined both with a project life cycle (PLC) and an SDLC, during which slightly different activities occur. According to Taylor (2004), the project life cycle encompasses all the activities of the project, while the systems development life cycle focuses on realizing the product requirements. But largely the SDLC is used during the development of an IT project, it describes the different stages involved in the project from the drawing board, through the completion of the project following the generic model but in different methodologies (Lawson, 2010).

**Figure 2 a diagram showing the SDLC Phases**




Source: International Council on Systems Engineering (2012) and modified by the researcher

There are a large number of life cycle process theories and models. As discussed in the System Life Cycle Process these are quite a large number, however the most relevant to the study include The Vee Model and the WaterFall Model.

**The Vee Model**

The Vee Model is designed to address the basic set of systems engineering (SE) activities. General implications of using the Vee model for system design and development and application into Business Analysis include; for a more specific understanding of how this life cycle model impacts systems

engineering activities and especially at the implementation stages herein referred to as project management (Boehm, & Turner. 2004).

The sequential version of the Vee Model is shown in Figure 1, whose core involves a sequential progression of plans, specifications, and products that are baselined and put under configuration management. The vertical, two-headed arrow enables projects to perform concurrent opportunity and risk analyses, as well as continuous in-process validation. The Vee Model encompasses the first three life cycle stages listed in the "Generic Life Cycle Stages" table of the International Council on Systems Engineering Systems Engineering Handbook: exploratory research, concept, and development (International Council on Systems Engineering 2012).

Fairley (2009) explains that depending on the Information technology solution being crafted or implemented in form of a project. Various variations of the Vee Model can be applied including the V-A macro variation which creates skewed iteration based on the first phases of the Vee model

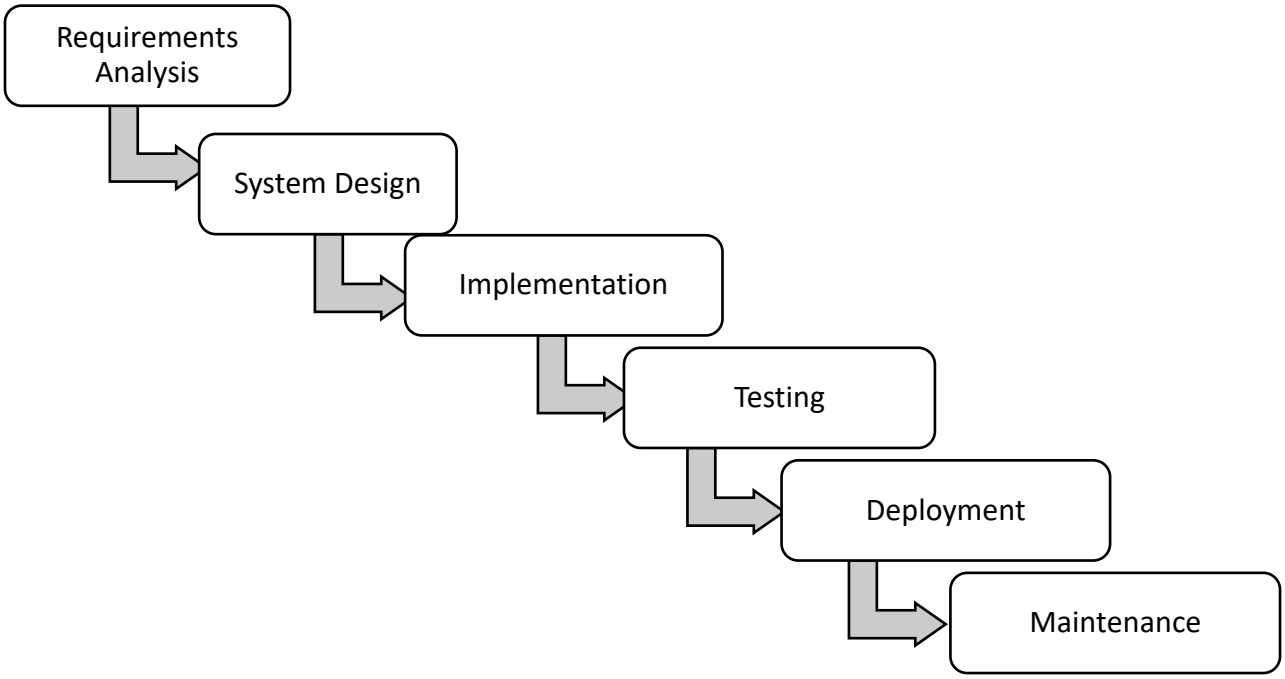
**The waterfall model**

According to Boehm & Turner (2004) the waterfall model is a sequential  that is non-iterative design process, used in software development processes, in which progress is seen as flowing steadily downwards like a waterfall through the phases of conception, initiation, analysis, design, construction, testing, production/implementation and maintenance. He explains that the waterfall development model originates in the manufacturing and construction industries: highly structured physical environments in which after-the-fact changes are prohibitively costly, if not impossible.

In Business Analysis the Waterfall Model was first Process Model to be introduced, largely looked at as a linear-sequential life cycle model. It is very simple to understand and use. In a waterfall model, each

phase must be completed before the next phase can begin and there is no overlapping in the phases. It is important to note that this model is used by the larger percentage of project management in standard Information technology solution and construction projects. It is also the earliest SDLC approach that was used for software development (Fairley, 2009).

**Figure 3 a diagram showing the Waterfall model**




Source: Fairley, (2009) and modified by the researcher

The sequential phases in Waterfall model best explain how business analysis and the project management according to Fairley (2009) below is a snapshot of the phases;

Requirement Gathering and Analysis: All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification doc.

System Design: The requirement specifications from first phase are studied in this phase and system design is prepared. System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture (Fairley, 2009).

Implementation: With inputs from system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality which is referred to as Unit Testing (Fairley, 2009).

Integration and Testing: All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures Deployment of system: Once the functional and nonfunctional testing is done, the product is deployed in the customer environment or released into the market (Fairley, 2009).

Maintenance: There are some issues which come up in the client environment. To fix those issues patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment (Beedle, et al. 2009).

The advantage of waterfall model is that it allows for departmentalization and control. A schedule can be set with deadlines for each stage of development and a product can proceed through the development process model phases one by one. Easier development moves from concept, through design, implementation, testing, installation, troubleshooting, and ends up at operation and maintenance. Each phase of development proceeds in strict order. The disadvantage of waterfall development is that it does not allow for much reflection or revision. Once an application is in the testing stage, it is very difficult to go back and change something that was not well-documented or thought upon in the concept stage (Beedle, et al. 2009).

Forsberg, Mooz & Cotterman (2005) elaborate on the activities in each life cycle stage and notes that it is useful to consider the structure of a generic life cycle stage model for any type of system-of-interest (SoI) as portrayed below. The general model is easier to integrate into any kind of information technology and engineering solution project. As shown the generic life cycle stages for a variety of stakeholders, from a standards organization such as ISO to commercial and government organizations. Although these stages differ in detail, they all have a similar sequential format that emphasizes the core activities

**Pinto's Model of Ten Critical Success Factors of the Projects**

According to Prabhakar (2005) Pinto's 10 critical success factors have been widely been accepted as a benchmark for Project success. Pinto used a fifty-item instrument called Project management Profile (P.I.P) to measure a project's score on each of the ten factors in comparison to over 400 projects studied, these are further discussed below;

Prabhakar (2005) continues to assert that client consultation which is communication and consultation with, and active listening to all affected parties. Personnel which is recruitment, selection and training of the necessary personnel for the project team. Technical tasks which is availability of the required technology and expertise to accomplish the specific technical action steps. Project mission – initial clarity of goals and general direction. Top management support which is willingness of top management to provide the necessary resources and authority of power for project success. Project schedule/plans which is detailed specification of the individual action steps required for project management. Client acceptance which is the act of "selling" the final project to its intended users. Monitoring and feedback which is timely provision of comprehensive control information at each stage in the implementation process. Communication which is provision of an appropriate network and necessary data to all key

actors in the project management. Trouble shooting – ability to handle unexpected crises and deviations from plan (Prabhakar, 2005).

According to Prabhakar (2005) the importance for both project team and clients to perform regular assessments to determine the "health" of the project and to involve team members in early planning and conceptual meetings. By doing so it can reinforces the goals of clients in the mind of the project team as well to obtain client's perceptions on the ability of the project to satisfy their expectation besides influencing team members to achieve a common project goal. Regular and continuous communication is essential to ensure the team is moving in one common direction and members are aware of transition and also to emphasize the importance of joint effort in making the project a successful one. Based on Pinto empirical research conducted in 1986 where 418 responds were obtained from a group of project managers in multiple industries, the ten factors identified explained 63.3% of the total variance in the dependent variable which is project success and 7 factors with p-values less than 0.05 were obtained.

**Kerzner's Model of the Critical Success Factors of Project Management**

Kerzner (1998) in his study defines the critical success factors as the elements which must exist within the organization in order to create an environment where projects may be managed with excellence on a consistent basis. They are the few key areas where "things must go right" for a particular business to flourish.

First critical factor: Corporate understanding of project management, In order for a successful project management and management, corporate understanding of the project management at the employee/functional level, project management level and executive level. A good corporate understanding will create a corporate culture where project management is no longer viewed as either a threat to established authority or a cause for unwanted change (Kerzner, 1998).

Second critical factor: Executive commitment, Raton (2015) further explains Kerzner's Critical Success Factors, he asserts that project management is unlikely to succeed unless there is any visible support and commitment by executive management. This support and commitment can be described in two subtopics; project sponsorship and life-cycle management. He explains that the role of the sponsor is to manage interference that exist for the project manager besides continuously remind project team that only performance at the highest standards of excellence are acceptable. According to him it is important that company goals, objectives and values be well understood by all members of the project team throughout the life-cycle of the project. Ongoing and positive executive involvement, in a leadership capacity will reflect executive management's commitment to project management (Kerzner, 1998).

Three critical factor: Organizational adaptability, Leffingwell & Widrig (2003) also explain the organizational adaptability element of Kerzner's Critical Success Factors. They explain that organizational adaptability refers to the organization's ability to respond quickly and effectively to changes in the marketplace. Two critical factors involving organizational adaptability were found in organizations committed to excellence; informal project management and a simple but lean structure. The decision to go for either formal or informal project management and implementation depends on the scope and size of the project, the cost of the project, and the availability of experienced personnel for the project and also the maturity of the concept of utilizing project in an organization. Staffing for projects was done in a manner to achieve a blend of experience, technical expertise and training. Leffingwell & Widrig (2003) continues to explain that proper selection of resources will insure that technical skills are optimally utilized with a minimum of overhead. A project team where its structure is simple and lean enable better control, communication and in budget. With this lean approach, the project manager must be experienced and have a qualified team. There must be a clear definition of responsibility and authority for individual members of the team and the project manager must be able

fill the roles of facilitator, coordinator, leader, organizer, planner, delegator and administrator in order for the project to be implemented successfully.

Fourth critical factor: Project Manager Selection Criteria, research has shown that there are four criteria that are normally used to select project managers are whether they were results-oriented, possessed strong interpersonal skills, their depth of understanding of the organization and lastly their commitment to corporate values (Baccarini, 1999).

Fifth critical factors: Leadership style, Leffingwell & Widrig (2003) in reference to Pinto's Critical success factors explain that strong leadership style by the project manager is necessary for the successful implementation of projects. Normally the project manager has a great deal of responsibility but does not have the commensurate authority as a line manager whereas the line manager has a great deal of authority but only limited project responsibility. Considering this fact, it is therefore important for a project manager to maintain a leadership style that adapts to each employee assigned to the project. This is further complicated by the fact that the project's life cycle may be so short that the project manager does not have sufficient time to get to know the people.

Sixth critical factors: Commitment to planning and control, Raton (2015) explains that well-managed projects are committed to planning. For example if the output of a project is to contain quality, then this quality must be properly planned for in the early stages of a project. When detailed planning is being done, it must be tracked or follow-up and re-planning must be done if the initial plan does not work before it is too late to do so. It is shown that personnel factor especially the project manager competence and leadership style is one of the crucial factor in project success implementation. This is true as project in itself has no essence unless it is managed by a group of people with the necessary skills, experience and qualification.

## 2.2 Understanding of the concepts

### 2.2.1 Business Analysis

Business Analysis is the practice of enabling change in an organizational context, by defining needs and recommending solutions that deliver value to stakeholders. The set of tasks and techniques that are used to perform business analysis are defined in a guide to the Business Analysis Body of Knowledge. The Business Analyst is an agent of change. Business Analysis is a disciplined approach for introducing and managing change to organizations, whether they are for-profit businesses, governments, or non-profits (Jonasson, 2012).

Robertson & Robertson (2005) explain that Business Analysis is used to identify and articulate the need for change in how organizations work, and to facilitate that change. As such the business analysts will identify and define the solutions that will maximize the value delivered by an organization to its stakeholders. The Business analysts work across all levels of an organization and may be involved in everything from defining strategy, to creating the enterprise architecture, to taking a leadership role by defining the goals and requirements for programs and projects or supporting continuous improvement in its technology and processes.

According to Sekaran (2003) the Business Analyst should have the specialized knowledge to act as a guide and lead the business through unknown or unmapped territory, to get it to its desired destination. The value of business analysis is in realization of benefits, avoidance of cost, and identification of new opportunities, understanding of required capabilities and modeling the organization. Through the effective use of business analysis, we can ensure an organization realizes these benefits, ultimately improving the way they do business.

According to the Beatty and Wiegers (2013) business analysis is the application of knowledge, skills, tools, and techniques to determine problems and identify business needs, identify and recommend viable solutions for meeting those needs, elicit, document, and manage stakeholder requirements in order to meet business and project objectives, facilitate the successful implementation of the product, service, or end result of the program or project. This broad definition suggests that business analysis involves effort in a variety of domains: from identifying business needs to solution implementation. Within each of these domains, there are a series of supporting tasks.

Turner (2004) argues that the Business Analysis tasks refine the broad definition and provide specific information about other important aspects of business analysis, such as, facilitating the identification of problems or opportunity analysis for portfolio investment, understanding the business environmental context and constraints, analyzing requirements, verifying requirements, evaluating solutions, among others.

### 2.2.2 Information Technology Project Management

According to Bredillet (2005) project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. Project managers must strive not only to meet specific scope, time, cost, and quality goals of projects, they must also facilitate the entire process to meet the needs and expectations of people involved in project activities or affected by them.

According to Turner (2004) project management is the discipline of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria. A project is a temporary endeavor designed to produce a unique product, service or result with a defined beginning and end; usually time-constrained, and often constrained by funding or deliverables undertaken to meet unique goals and objectives, typically to bring about beneficial change or added

value. The temporary nature of projects stands in contrast with business as usual or operations which are repetitive, permanent, or semi-permanent functional activities to produce products or services. In practice, the management of these two systems is often quite different, and as such requires the development of distinct technical skills and management strategies. The primary challenge of project management is to achieve all of the project goals within the given constraints.

Crawford, Pollack & England (2006) discuss that Information Technology project management is a sub-discipline of project management in which information technology projects are planned, monitored and controlled. Information Technology project management is thus the process of planning, organizing and delineating responsibility for the completion of an organizations' specific information technology (IT) goals.

## 2.3 Actual Review

### 2.3.1 Requirement Gathering and Elicitation and the Success of IT project management

According to Gottesdiener & Gorman (2012) in requirements engineering, requirements elicitation is the practice of collecting the requirements of a system from users, customers and other stakeholders. The practice is also sometimes referred to as "requirement gathering". The term elicitation is used in books and research to raise the fact that good requirements cannot just be collected from the customer, as would be indicated by the name requirements gathering. Requirements elicitation is non-trivial because you can never be sure you get all requirements from the user and customer by just asking them what the system should do OR NOT do.

There are various practices, tools and techniques that practitioners use in a bid to have contribution of the management activities of requirement gathering and elicitation and use these to impact on how successful project management of Information technology project management can be, these include among others the following with a discussion showing how this improves the project success (Gottesdiener, & Gorman, 2012).

One of the most common technique used in Business analysis to gather requirement and user needs is the 5 Whys. Ross & Lam (2011) argue that the objective of Five Whys is to ask for the cause of a problem up to five times or five levels deep to truly understand it. A business analyst does not always need to literally ask “why” up to five times. Instead, the Five Whys are used to begin with a problem and ask why it occurs until the root cause becomes clearer. Quite often, businesspeople bring solutions to the project team, but it is essential to first clarify the business problem with a technique like Five Whys before considering solutions. Other techniques may be needed to refine the root cause, but Five Whys is a good starting point. Raton (2015) cautions that it is important to ask “why” using appropriate questions and to limit the actual use of the word “why,” because it can cause the interviewee to become defensive.

This level of in-depth scrutiny of what the client or user requires helps in ensuring that the right scope is crafted and that at project implementation the user may not be able to reject what they initially requested.

Paul, Yeates & Cadle (2010) discuss that PESTLE is used to perform an external environmental analysis by examining the many different external factors affecting an organization especially during the requirement gathering and elicitation stage. The six attributes of PESTLE are Political; current and potential influences from political pressures, Economic; the local, national and world economy, impact, Sociological; the ways in which a society can affect an organization, Technological; the effect of new and emerging technology, Legal; the effect of national and world legislation, Environmental; the local, national and world environmental issues. This level of insight is undertake to further understand the factors around the requirement, this thus becomes a stepping stone for project management and thus ensures better success in management of Information technology projects.

Research also indicates that heptalysis is one of the technics used in business analysis, it refers to the method of analyzing seven factors that should be considered in the early stage of starting a business or a incorporating a business technology solution. It is mostly used in analyzing of venture capital funding for a novel idea or product where recognizing the risk is an important factor. This is used to perform an in-depth analysis of early stage businesses/ventures on seven important categories: market opportunity, product/solution, execution plan, financial engine, human capital, and potential return, margin of safety. Its worth note that project management can easily leverage on this insight at the stage of project implementation to better and increase the probability of project success (Larson& Larson, 2012).

Facilitated Workshops; a very common practice and technique during the requirements gathering and elicitation phase is the facilitated workshops, also known as requirements workshops, these are focused sessions that bring key cross-functional stakeholders together to define product requirements. Research

indicates that workshops are considered a primary technique for quickly defining cross-functional requirements and reconciling stakeholder differences. Due to their interactive group nature, well-facilitated sessions can build trust, foster relationships, and improve communication among the participants, which can lead to increased stakeholder consensus. In addition to this Hillman (2013) argues that there is synergy when ideas from various people help to stimulate new thoughts from others, disagreements among business units or individual stakeholders are resolved as they come up during elicitation, saving time later. Also the issues are discovered and resolved more quickly than in individual sessions. Obtaining agreement on issues is easier when the group is assembled together. This thus impacts on project management success since engagement is higher when stakeholders are urged to participate. In the same way there is a perception that no one stakeholder will have a higher influence on the solution, because everyone is in the meeting together (Gottesdiener, & Gorman, 2012).

The facilitated workshop may also include the solution team or its lead. The benefits of a cross-functional facilitated workshop are as follows: There is a team building aspect that unites the group laying a foundation for easier and more successful project management especially of Information Technology. There is a better chance for a binding agreement between the solution team and the product stakeholders. The solution team is more committed when they are able to meet directly with the stakeholders for whom they are building the solution. The solution team or its lead learns the context of the problem, solution, and decisions, which provide a more informed basis for developing a solution. The requirements resulting from a combined meeting are more likely to be implemented, because the work was developed collaboratively (International Institute of Business Analysis, 2009).

Document Analysis, according to Blais (2011) document analysis is an elicitation technique used to analyze existing documentation and identify information relevant to the requirements. Business analysts can start their analysis work with this technique to gain some understanding of the environment and

situation prior to engaging directly with stakeholders. Document analysis provides the following benefits: Information received from individuals is subjective, whereas documented information tends to be more objective. While it is always good to have the subjective viewpoints of a number of different individuals on the same topic, it is best to have the objective and factual information first to use as a baseline to understand the subjectivity variations. Documents may contain information that no one individual has. This is found in older descriptions of a system or business process, source material for regulations, and other mandatory procedures. Turner (2004) argues that the downside of the document analysis method is that documentation may not be available or the existing documentation may be out of date, thereby providing erroneous information. Even when documentation is maintained and considered current, there is a risk that previous system constraints or limitations will be documented as current business practices. It may be difficult for the business analyst to decipher these limitations without having a current conversation with a business stakeholder.

### 2.3.2 Requirements Analysis and Engineering and the Success of IT project management

Frisendal (2012) argues that in information technology, systems engineering and software engineering, requirements analysis encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product or project, taking account of the possibly conflicting requirements of the various stakeholders, analyzing, documenting, validating and managing software or system requirements. Requirements analysis is critical to the success or failure of a systems, Information Technology or software project. The requirements should be documented, actionable, measurable, testable, traceable, related to identified business needs or opportunities, and defined to a level of detail sufficient for system design (Larson & Larson, 2012).

Krajewski & Ritzman (2005) argues that "MOST" is used to perform an internal environmental analysis by defining the attributes of "MOST" to ensure that the project you are working on is aligned to each of the four attributes. Business Analyst here focus on the requirement and business needs to ensure that they align with the organizational mission and objectives. The four attributes of MOST, mission; where the business intends to go, objectives; the key goals which will help achieve the mission, strategies; options for moving forward, tactics; how strategies are put into action, facilitating better information technology project management success.

According to Hillman (2013) the business analyst may use SWOT analysis to help assess organizational strategy, goals, and objectives. SWOT; standing for strengths, weaknesses, opportunities, and threats, is a common method used to facilitate discussions with stakeholders when articulating high-level and important aspects of an organization, especially as it pertains to a specific situation. SWOT uses the four categories mentioned previously and provides an additional context for analyzing the business need. It

helps to translate organizational strategy into business needs. SWOT investigates the situation internally and externally as follows:

Hillman (2013) continues to present that internally, SWOT shows where the organization has current strengths to help solve a problem or take advantage of an opportunity. Examples of strengths include a knowledgeable research staff, strong brand reputation, and large market share.

Research reveals or acknowledges weaknesses that need to be alleviated to address a situation. Weaknesses may include low recognition in the market, low capitalization or tax base, and bad publicity due to real or imagined failures.

Hillman (2013) continues to present that internally, SWOT generates potential opportunities in the external environment to mitigate a problem or seize an opportunity. Examples of opportunities include underserved markets, termination of a competitor's product line, and discovery of a customer need that the organization can satisfy with a new product. He also explains that SWOT is able to shows threats in the market or external environment that could impede success in solving business needs. Threats may include increased market share by the competition, new products offered by competitors, mergers and acquisitions that increase a competitor's size and clout, and new regulations with potential penalties for noncompliance (Thamhain, 2004).

SWOT is a widely used tool to help understand high-level views surrounding a business need. The business analyst may use SWOT to create a structured framework for breaking down a situation into its root causes or contributors (Hass, Wessels & Brennan, 2007).

Carkenor (2008) argues that cause-and-effect diagrams decompose a problem or opportunity to help trace an undesirable effect back to its root cause. These diagrams help to break down the business problem or opportunity into components to aid understanding and generally provide the main aspects of the problem to analyze. They are typically high-level views of why a problem is occurring or, in the case

of an opportunity, these views represent the main drivers for why that opportunity exists. Thamhain (2004) argues that cause-and-effect diagrams are designed to understand the cause of a problem so as not be distracted by its symptoms. These diagrams take a systems view by treating the environment surrounding the problems as the system and by avoiding analysis of the problems imposed by people or staff.

According to Gottesdiener and Gorman (2012), there are several types of cause-and-effect diagrams that could be used to uncover root causes. Most of these techniques can be used along with the Five Whys to dissect a problem. Two of the most useful cause-and-effect diagrams are described as follows: Formally called Ishikawa diagrams, Fishbone Diagrams, are one of the techniques that Turner (2014) presents. He explains that these diagrams are snapshots of the current situation and high-level causes of why a problem is occurring. These diagrams are often a good starting point for analyzing root cause. Fishbone diagrams lend guidance to the causes that will provide the most fruitful follow-up. For example, they often uncover areas in which data is lacking and would be beneficial to collect. However, this technique is not sufficient for understanding all root causes (Turner, 2004).

Also in regards to Interrelationship Diagrams**,** Raton (2015) argues that these are special type of cause-and-effect diagram is helpful for visualizing complex problems that have seemingly unwieldy relationships among multiple variables. These diagrams are most useful for identifying variables, but similar to the fishbone diagram, this technique is not sufficient for understanding all root causes. In some cases, a cause of one problem may be the effect of another (Raton, 2015).

The interrelationship diagram can help stakeholders understand the relationships between causes and effects and can identify which causes are the primary ones producing the problem. Constructing an interrelationship diagram helps participants isolate each dimension of a problem individually without it being a strict linear process. Focusing on the individual dimension allows participants to concentrate on

and analyze manageable pieces of a situation. When the analysis is complete, the diagram sheds considerable light on the problem, but only after the entire diagram has been assembled (Crawford, Pollack & England, 2006).

De Bono's Six Thinking Hats, according to Linman (2015) this is often used in a brainstorming session to generate and analyse ideas and options, this analysis helps in scoping and in better management of information technology projects. It is useful to encourage specific types of thinking and can be a convenient and symbolic way to request someone to "switch gears". It involves restricting the group to only thinking in specific ways - giving ideas & analysis in the "mood" of the time. Also known as the six thinking hats. Where white is for pure facts and logical, green is for creative, yellow is for bright, optimistic and positive ideas. Black is usually used for negative and devil's advocate based ideas and suggestions. Red for emotional and blue is for cold, and control based ideas. It is worth note that not all colors or moods have to be used (Linman, 2015).

According to Crawford, Pollack &England, 2006), MoSCoW is used to prioritize requirements by allocating an appropriate priority, gauging it against the validity of the requirement itself and its priority against other requirements. MoSCoW comprises: Must have - or else delivery will be a failure, should have - otherwise will have to adopt a work around, could have - to increase delivery satisfaction, would like to have in the future - but won't have now. This aspect of prioritizations helps even at a project management stage to ensure that implementation of modules or features in the Information Technology solution are done according to priority set at the business analysis stage of the project.

According to Hass, Wessels & Brennan (2007) VPEC-T is used when analyzing the expectations of multiple parties having different views of a system in which they all have an interest in common, but have different priorities and different responsibilities. Values constitute the objectives, beliefs and concerns of all parties participating. They may be financial, social, tangible and intangible Policies -

constraints that govern what may be done and the manner in which it may be done events - real-world proceedings that stimulate activity Content - the meaningful portion of the documents, conversations, messages, etc. that are produced and used by all aspects of business activity Trust - between users of the system and their right to access and change information within it (Crawford, Pollack & England, 2006). According to Carkenord (2008) brainstorming is a data gathering technique that can be used to identify a list of ideas in a short period of time for example the list of risks, stakeholders, or solutions to issues. Brainstorming is conducted in a group environment and is led by a facilitator. A topic or issue is presented and the group is asked to generate as many ideas or solutions as possible about the topic. He argues that ideas are provided freely and rapidly and all ideas are accepted. Because the discussion occurs in a group setting, participants feed off of each other's inputs to generate additional ideas. The responses are documented in front of the group so progress is continually fed back to the participants. The facilitator takes on an important role to ensure all participants are involved in the discussion and to ensure no one individual monopolizes the session or critiques or criticizes the ideas that are offered by others.

Carkenord (2008) further argues that brainstorming is comprised of two parts: idea generation and analysis. The analysis is conducted to turn the initial list of ideas into a usable form of information. In business analysis planning, brainstorming can be leveraged to build the initial list of stakeholders, to discover new stakeholders, or to identify a list of tasks to be included in the business analysis work plan; these are what is translated to the project during implementation. It is quite a critical practice that is undertaken by the business analysis team that better facilitates how information technology projects can be successful.

### 2.3.3 The role of Requirements Traceability and Solutions Evaluation on the Success of IT project management

According to Bredillet (2005) requirements traceability is a sub-discipline of requirements management within software development, Information Technology and systems engineering. Requirements traceability is defined as the ability to describe and follow the life of a requirement in both a forwards and backwards direction that is to say from its origins, through its development and specification, to its subsequent deployment and use, and through periods of ongoing refinement and iteration in any of these phases. However, traceability may document relationships between many kinds of development artifacts, such as requirements, specification statements, designs, tests, models and developed components.

Solution evaluation on the other hand consists of business analysis activities performed to validate a full solution or a segment of a solution; that is about to be or has already been implemented. Evaluation determines how well a solution meets the business needs expressed by stakeholders, including delivering value to the customer. Some evaluation activities result in a qualitative or coarsely quantitative assessment of a solution. Conducting surveys or focus groups and analysing the results of exploratory testing of functionality are examples of qualitative or coarsely quantitative evaluation. Other evaluation activities involve more precise, quantitative, explicit measurements (Cadle, Paul, & Turner, 2010).

Comparisons between expected and actual results obtained from a solution are usually expressed quantitatively. For solutions involving software, analysing comparisons between expected and actual values of data manipulated by the high-level functionality of the solution can be part of the evaluation. Non-functional characteristics of a solution sometimes known as quality attributes are often evaluated with measurements. For example, measurements are required to evaluate whether performance service-level agreements are being met. Additionally, comparing estimated and actual costs and benefits may be

part of an evaluation of a solution. Solutions that are well evaluated with the required level of traceability are way easier to implement, this section of the business analysis greatly improves the probability of success of the project (Paul, Yeates, & Cadle, 2010).

Solution evaluation activities provide the ability to assess whether or not a solution has achieved the desired business result laying a firm foundation for project management as the project benefits are fully scrutinised way before implementation. Evaluation provides input to go/no-go business and technical decisions when releasing an entire solution or a segment of it. For projects using iterative or adaptive life cycles, and for multiphase projects using predictive life cycles, evaluation may identify a point of diminishing returns. An example of this is when additional value could be obtained from a project, but the additional effort needed to achieve it is not justified. Evaluation of an implemented solution may also be used to identify new or changed requirements, which may lead to solution refinement or new solutions. Identification and definition of evaluation criteria also supports other analysis activities (Paul, Yeates, & Cadle, 2010).

According to Andrea et al (2016) prototyping as a method of obtaining early feedback on requirements provides a working model of the expected product before building the actual IT solution. Since prototypes are tangible, stakeholders are able to experiment with a model of the final product rather than discussing abstract representations of the requirements. Prototypes support the concept of progressive elaboration in iterative cycles of mockup creation, user experimentation, feedback generation, and prototype revision. A prototype can be a mockup of the real result as in an architectural model, or it can be an early version of the product itself. Elicitation and thorough investigation may not uncover all of the attributes or aspects of a complex solution. Allowing the users and customers to see the product or system as it is being built provides an opportunity for the business to identify issues, clarify requirements, and provide additional information that may have been omitted originally. This in brief eliminates any

kind of back and forth during the installations or implementations of the project. Given that prior assessment and modeling was done in the business analysis phase (Lieberman, 2006).

Ambler (2005) argues that process models describe the user or stakeholder elements of a solution, process, or project. Process flows, also called swim-lane diagrams, process maps, process diagrams, or process flow charts, visually depict the tasks that people perform in their jobs. Typically, process flows describe the steps that people take although they may describe system steps and could be called system flows. In process flows, boxes depict steps, diamonds indicate decision logic, and arrows show the order of flow. Process flows may also contain swim-lanes, which group steps together that are performed by the same person, group of people, or system. According to Hass, Wessels & Brennan (2007) it is helpful only people or system process steps in a given diagram to reduce shifting the context for the reader between the human and system processes. Process flows are developed to model the as-is processes for example how activities are currently performed in an organization as well as the to-be processes for example proposed process revisions or new proposed processes.

According to Paul, Yeates & Cadle (2010) within Business Analysis interface models depict the relationships within a solution; this helps the intended solution users to gain an understanding of which interfaces are in existing and the details of those interfaces. They argue that a report table in this model would capture the detailed level requirements for a single report. Common attributes of a report include: name, description, decisions made from the report, objectives, audience, trigger, data fields, data volume, frequency, display format, and calculations. They argue that these attributes should be specified alongside a prototype or example of the actual report, when possible, because it adds context for the textual information in the report table. They further emphasis that while it is not necessary to System Interface these two can work together thereby improving how a project can be implemented and thus the success. A system interface table is also a model of attributes that captures all of the detailed level

requirements for a single system interface. The system interface table is in a tabular format and typically includes attributes such as source system, target system, volume of data passed, security or other rules, and the actual data objects passed (Turner, 2004).

Ranking two or more options can be done using various techniques as part of the solution validation and evaluation efforts to improve the success of IT project management. Alexander& Beus-Dukic (2009) discuss that a practical and effective method is to use a weighted ranking matrix. A weighted ranking matrix or table combines pair-matching with weighted criteria to add objectivity to a recommendation. Pair-matching is performed by taking each option and comparing it one by one to all other options, and then voting or ranking which option is the most preferred. Weighted ranking is also useful to test an initial or intuitive choice against other options making IT project management and implementation easy. The criteria used for ranking should align with the goals and objectives identified earlier in the needs assessment. The basic approach is to select weighted criteria for each item to be ranked. Each option is ranked by voting on it against every other option, one at a time. Scores for each alternative are multiplied by the weights and added to arrive at the score for each option and the overall rankings.

According to the Turner (2004), validation is defined as the assurance that a product, service, or system meets the needs of the customer and other identified stakeholders. Also defines verification is the process of reviewing the requirements for errors and quality. He argues that verification may occur before or after validation. Verifying requirements after they have been validated or confirmed by product stakeholders ensures that only the requirements that are considered to be good requirements are verified. From his argument validation is concerned about ensuring that the requirements solve the problem; verification is not.

The practice guide of Project Management Institute (2015) equally submit that verification is performed by members of the solution team to ensure that the requirements meet quality standards or any other

business analysis deliverable in the process meets the standards of excellence for . There are two types of verification processes: peer reviews and inspections.

### 2.3.4 Information Technology Project Management dimensions of success

For many years project managers have been encouraged to look to the triple constraints to provide a framework to plan, monitor and control a project. Project Management Institute (2015) defines the triple constraint as a framework for evaluating competing demands. These triple constraints which are also the dimension of project management success include traditionally; time, cost and scope, with quality occasionally included as an adjunct to or substitute for scope, or as a fourth constraint or success dimension indicated the key factors that both defined the framework of a project, and directed project managers as to where adjustments would have to be made if one or another of those constraints became problematic (Larson & Larson, 2012).

There has been a growing understanding of the factors impacting on a project; Office of Government Commerce (2013) through the PRINCE2 methodology has identified these revised factors through its focus on tolerances. While building on the core factors of time, cost and scope, Office of Government Commerce has added quality as a distinct factor, project constraint or success dimension, along with benefits and risk to produce six constraints and dimensions to project success. The PRINCE2 methodology employs tolerances into its term for these six constraints as key project controls. They are dimensions of the project for which ranges of acceptability are defined, which are monitored to identify or anticipate when a plan has entered “problematic” or “exception” territory. They are needed and used at all three planning levels of a project; the project as a whole, any one stage or phase of the project, and at the detail work package level.

Time and Cost, these are considered the standard constraints and project success dimensions. They are reflected in project estimates and presented as ranges that plus-or-minus. According to Office of Government Commerce (2013) in PRINCE2 terms, as long as there operating or delivering the projects

inside that agreed range limit, once can considered on-target and thus successful in project management. Good project management practice requires that Project managers provide ranges for these constraints which ranges representing the estimating uncertainties associated with a project's particular circumstances. According to Office of Government Commerce (2013) PRINCE2 separates these estimating uncertainties from funds set aside for specific purposes: a Change Budget which is a fund to implement requests for change to scope or quality characteristics, or a Contingency Budget which funds to respond to previously defined risk contingencies (Gottesdiener, & Gorman, 2012).

Classically time and cost are the first place the sponsors look and for some sponsors, the only place to see if a project is not performing well or not meeting stakeholder expectations. This is probably because they are the most tangible measurements: Project manager have a due date and a budget it becomes easier to disguise some missing features, or gloss over quality checking, however Time and cost are ever evident and very critical when it comes to the project management success dimensions. Since the sponsors usually aren't quite sure what the detail scope characteristics are, or what goes into quality checking, everyone is just as happy to see them ignored or minimized, in favor of time and cost (Davis, 2005).

In the classic model, Risk and Benefits constraints don't even exist, so they are certainly not under consideration when it comes to the triple constraints or the big three success dimensions of project management however a detailed over view of the project management dimensions of success is discussed below; (Jonasson, 2012).

Scope, according to Office of Government Commerce (2013) scope doesn't have the same ease of definition as normally being defined through “ranges”. Scope refers to the particular deliverables involving products in PRINCE2 terminology, which have been agreed to by the project's owners, Project

Management Institute (2014) however looks at it plainly as the coverage that the project should take care of. In most cases there are no ranges of acceptability for scope. This is a very important project success dimension that is critical to all the other project variable. If it's not management well it leads to scope creep (Beatty, and Wiegers, 2013).

Quality, quality constraint or quality tolerance is actually quite similar to that of scope, except that quality focuses on characteristics of a deliverable. Quality works in the same mode as the other constraints. For example, if a project is running late or over budget, the project manager may still be able to deliver the expected items but they might not be tested as thoroughly that is project managers do not assure that the characteristics are present and working properly. This is how quality operates as a constraint and as a success dimension. Some models of the triple constraint triangle use quality instead of scope as the 3rd leg of the triangle. In many classic situations, when time or cost was strained, it was quality – usually through less testing or verification, but sometimes through dropped characteristics that was compromised (Cooke-Davies, 2002).

The last two elements of the six-constraint model and success dimensions are the newest and least-familiar ones, and could be considered controversial except that they are both already present in projects. Project Managers are not creating them, they are rather just bringing them to the forefront and demonstrating how they interact with the "classic" constraints of time, cost, scope, and quality. When these two new dimensions of project management success that is benefits and risk are not considered, they are likely to be neglected and produce a negative impact on the project success.

Benefits, according to Office of Government Commerce (2013) benefits represent the value the project is expected to deliver to the organization. In PRINCE2 terms, projects are not done without clear understanding of the benefits. PRINCE2 methodology requires the project to have a Business Case

which shows a clear justification, with measurable, agreed benefits that are expected to result from the project's outputs. If there is no clear justification, then the project should not be started, and if the justification disappears – or is reduced below an agreed-upon limit – the project should be stopped. Thus success of project management or a project depends on how well the project is delivering this required Quality (Krajewski, & Ritzman, 2005).

According to Larson & Larson (2012) while a project's objectives may be to deliver a new sales system, its value would be in its ability to increase sales, or improve customer service. Either one of these we would want to measure, to determine whether the new sales system was worth the time and cost to create it. Even governmental or nonprofit or charitable projects need to have a Business Case; some measurable means to focus the project, and to use to assess the effectiveness of the project. It is rarely possible to assess all benefits during a project. In a PRINCE2 environment there would be regularly or anticipate assessment of the expected benefits as a measure of project management success.

Everyone recognizes the risk on a project needs to be addressed and managed. Project Managers can see that in any project there may be a level of risk that they are simply not willing to live with, or tolerate. That is the basis of risk tolerance and overall measurement of project management success in regards to risk. Its simplest and most common expression is in examining the probability of significant risks occurring, their potential impact on the project if they do occur, and the degree of willingness to live with those potential consequences. Risk refers to opportunities as well as threats, and can be applied in a similar manner. Risk Tolerance of stakeholders is presented as an important consideration in the guide especially in consideration of the risk knowledge area, but how one establishes “risk tolerance” is not defined (Project Management Institute, 2014).

## 2.4 Summary of the Review

In summary business today is operating under high level of uncertainty, projects implementation are open to all sorts of external influence, unexpected events, ever growing requirements, changing constraints and fluctuating resource flows. Business Analysis in information technology project management is one of the key endeavors to mitigate the uncertainty and a measure to improve on the level of Information Technology projects success, this level of benefit has however not been tied down to key performance indicators that businesses would ably relate with to cause diligent application. Project manager and business analyst are both important and key role for any Information Technology project. Both of these role share many responsibilities, so some get confused about what differentiate in their roles. Difference lies in their accountability. As seen from the different scholar including Linman (2015), Podeswa, (2008), and Jonasson, (2012), project management is about implementing change to business environment, and business analysis is about ensuring the expected quality and value of that change. Both are strategic processes that can exist independently. However, in practice they come up together as no project can be implemented strictly according to the business requirements if no thorough analysis has been carried out during the project lifecycle. A combination of effective project management and incisive business analysis creates a foundation for justifying and accomplishing the ultimate objective of adding value into business operations. A project is successful when it achieves its objectives and meets or exceeds the expectations of the stakeholders. These stakeholders are individuals who either care about or have a vested interest in your project, all their needs must be taken care of through business analysis and project management to enable project success. From the review it's clear that most literature capture the points of blend between Business Analysis and Project Management highlighting the mishaps of implementation of the practices.

# CHAPTER THREE:

# RESEARCH METHODOLOGY

## 3.0 Introduction

The chapter illustrated the methodological aspects that were being used in gathering data from the field during conducting the study. It portrayed the research designs, area of study, and the study population, sampling techniques, sample size and, the data collection methods and instruments, the quality control methods, the data management and processing, data analysis and the ethical consideration as well as the limitations to the study.

## 3.1 Research Design

The researcher used a case study research design type. This is because it brings better understanding of a complex issue especially with a management, technology and engineering cross-blended research that the researcher undertook. This type can extend experience or add strength to what is already known through previous research and refocused study on the case study in question.The researcher combined both descriptive and analytical design approaches to the case study research design type to assess the role of Business Analysis in Information Technology Project Management.

According to Mugenda, & Mugenda (1999) descriptive research is used to describe characteristics of a population or phenomenon being studied. It does not answer questions about how/when/why the characteristics occurred. Rather it addresses the ‘what question’; the characteristics used to describe the situation or population are usually some kind of categorical scheme also known as descriptive categories. The researcher wanted to use this design approach to enable him explain the current phenomenon in Business Analysis and Information Technology project management within the east African region.

According to Pew & Mavor (2007) analytical research on the other hand is a specific type of research that involves critical thinking skills and the evaluation of facts and information relative to the research being conducted. From analytical research, a person finds out critical details to add new ideas to the material being produced. This design was largely used in analysis of the data that was collected to make logic sense of the empirical evidences, and the practices in the information technology currently.

The researcher used the combination of design to enable description of the knowledge gathered with inference to the case study as well as analysis using both qualitative and quantitative approaches in all research stages in order to obtain in-depth information of words and be able to draw conclusions on the study basing on the sample.

## 3.2 Area of Study

The Researcher focused on Business Analysis and Information Technology Project Management as the areas of study using Dimension Data East Africa as the case study. The researcher considered Dimension Data since it's a global IT integrator that has well set up practices for both IT project management and Business Analysis, and through its professional service delivery and the consulting department, the company has interfaced a lot with clients and still does in regards to the study variables (Dimension Data, 2017).

## 3.3 Study Population

The study was carried out in the Dimension Data head office and branches sampling through a population of a cross-section of staff and client which was 95 at the time of research; including staff in the region of Uganda, Kenya, Tanzania and Rwanda; this is because the company is a lean entity and majority of the staff get involved in project management and business analysis activities both directly and indirectly.

The researcher used a heterogeneous population including Dimension Data staff and Dimension Data clients; where the researcher interviewed a cross section of 20 clients who have closed projects with Dimension Data in the last five years (Dimension Data, 2017).

## 3.4 Sampling Procedure

The researcher used simple random sampling procedure. The sampling frame was based on the current staff profile, which provided names of the staff working in Dimension Data, their designation, and department. The names of staff that participated in the study were randomly selected basing on the level of seniority and involvement in business analysis and Projects as well as the project management archive that provides a list of closed projects and the contact person on the client's side.

### 3.4.1 Sample Size

The study targeted a sample size of 76 respondents, the sample size was determined by using Krejcie and Morgan's (1970), table for determining the sample size the respondents comprised of engineers of various sections and key participants in the business analysis and project related activities of the Dimension Data as shown in the table above. Staff were selected purposively in their departments and sampled to gather the data required for this study

**Table 3.1 Sample Size**

| Target Respondents | Population | Sample size | Sampling Technique |
|---|---|---|---|
| Project Engineers | 42 | 36 | Simple Random sampling |
| Pre-sales Engineers | 6 | 5 | Simple Random sampling |
| Support service Engineers | 12 | 8 | Simple Random sampling |
| Solution architects | 4 | 4 | Simple Random sampling |
| Project Managers | 8 | 8 | Simple Random sampling |
| Business Analysts | 2 | 2 | Simple Random Sampling |
| Finance & administration | 4 | 2 | Simple Random sampling |
| Sales staff | 7 | 2 | Simple Random sampling |
| Clients | 10 | 9 | Simple Random sampling |
| **Total** | **95** | **76** | |

**Source: Dimension Data (2017).**

### 3.4.2 Sampling Technique

The researcher used a simple random sampling procedure, where respondents was chosen at random in their department. In this technique, each member of the population had an equal chance of being selected as a respondent. The entire process of sampling was done in a single step with each subject selected independently of the other members of the population.

This is because staff in the organization have a fairly equal understanding of how projects are management and with good basic understanding of the business analysis practices. In the same way the clients have a fairly equal experience on closed projects and would give good feedback on the role Business Analysis played in IT Project Management.

## 3.5 Data Sources

The researcher used both primary and secondary data sources

### 3.5.1 Primary data:

This was gathered from Dimension Data employees since these have more practical interface with IT solution project deployments and have experience on how the success of this was facilitated by business analysis. Equally more primary data was gathered from the past and current clients of dimension data whom past projects had been deployed.

### 3.5.2 Secondary data:

This was collected from sources like relevant body of knowledge like the Business Analysis Book of Knowledge and Project Management Book of Knowledge, practice Guides, textbooks, magazines, newspapers, articles, and journals.

## 3.6 Data Collection Methods and Instruments

The Data instruments that the researcher used included questionnaire. A structured self- administered questionnaire covering the variables in the study was used. In these questionnaires, a five point Likert scale was used to ease data processing and analysis. The scale was marked 1-5 where; 1 represented strongly disagree and 5 strongly agree. The research questionnaire was developed using a Likert scale consisting of scales on measurement of performance anchored on a five likert scale from 1- strongly disagree, 2- disagree, 3- not sure, 4- agree and 5- strongly agree. This type of measure was supplemented by qualitative measures to actual findings on the impact of the variable over a period of time.

## 3.7 Data Quality Control Methods

As part of the data quality control various reliability and validity test were undertaken. This is because

it was important to achieve a reasonable level of reliability and validity thus the researcher undertook to confirm the meaning of scores to avoid ambiguity. Validity was measured basing on a factor analysis which confirmed the dimensions of the concepts that were defined to ensure appropriateness of results. Primary Data collection instruments was pre-tested to determine whether they were sufficiently prepared for the study. According to Mark, (1995) before a survey instrument is used to collect meaningful data, it has to be pre-tested to ensure its accuracy. This was done to streamline any inconsistencies that would have arisen in structuring the questions as well as ensuring language clarity.

### 3.7.1. Validity

According to Amin (2005) and Kothari (2004) validity refers to the quality that a procedure or an instrument. According to Sekaran (2003) Validity is the best available approximation to the truth or Falsity of the given inference, proposition or conclusion. Alden (2007) observes that the quality of an instrument refers to the degree to which the resulting score truly represents the factor to be measured. According to Amin (2005) for the instrument to be acceptable, the average index should be 0.6 and above. Validity was arrived at after calculating the coefficient of validity index which was obtained using the following formula:

$$CVI = \frac{R}{R+N+IR}$$

Where;

**R** is Relevant, **N** is Neutral, and **IR** is irrelevant. The closer the value is to 1, the more valid the instrument (Amin, 2005).

The CVI for the study was 94.44

### 3.7.2. Reliability

Reliability refers to how consistent a research procedure or instrument is with its results (Ahuja, 2005). Reliability was calculated to establish the acceptable Cronbach's alpha value of 0.7 and above (Amin, 2005, Bryman & Cramer, 2001). Cronbach's alpha establishes internal-consistency as a measure of the extent to which item responses obtained at the same time correlate highly with each other. The researcher used the Statistical Package for Social Sciences (SPSS) software version 2.1 to compute Cronbach's reliability coefficient on the Likert scale items in the questionnaire.

**3.7.3 Cronbach's Alpha test on Validity and reliability**

| **Reliability Statistics on Requirements gathering & elicitation** | |
|---|---|
| **Cronbach's Alpha** | **N of Items** |
| 0.873. | 73 |
| **Reliability Statistics on Requirements analysis & engineering** | |
| **Cronbach's Alpha** | **N of Items** |
| 0.894 | 73 |
| **Reliability Statistics on Requirements validation & solution evaluation** | |
| **Cronbach's Alpha** | **N of Items** |
| 0.818 | 73 |

Research findings indicated that the reliability of the tool in relation to Requirements gathering and elicitation was strong as indicated by the Cronbach's Alpha of 0.873. This satisfies the validity of the research findings and thus the reliability of the same results.

Research findings indicated that the reliability of the tool in relation to Requirements analysis and Engineering was strong as indicated by the Cronbach's Alpha of 0.894. This satisfies the validity of the research findings and thus the reliability of the same results.

Research findings indicated that the reliability of the tool in relation to Requirements validation and solution evaluation was strong as indicated by the Cronbach's Alpha of 0.818. This satisfies the validity of the research findings and thus the reliability of the same results.

### 3.8 Data Management and Processing

Collected data was compiled, sorted and edited to have the required quality, validity, and reliability in line with the research. Quantitative methods of data analysis to test for hypothesis and investigate relationship between the dependent and independent variables were used. In the coding process, a coding sheet was constructed.

### 3.9 Data Analysis

Data analysis and management was done using Statistical Package for Social Sciences (SPPS 2.1), Excel Sheets, statistics, charts, graphs, factor analysis, factor tabulation, correlations and regression tests was generated to describe the sample characteristics and the objectives of the study. Frequency tables were worked out basing on the data entered into statistical packages for social sciences in these frequency tables, analysis was done with a corresponding percentage in each table.

### 3.10 Ethical Considerations

A request to undertake the research was made by the researcher, and after supervisor authorization, an authorization to undertake field research was given by the University. A request was made by the researcher to conduct research in the case study organization and upon thorough review approval to

conduct this study was given by the Human Resources Department, section of Training and Professional development. Where a general communique was mailed out to assist the researcher to undertake his research as requested. Informal consent was sought from the respondents and their decision to participate be respected. Confidentiality of the information was upheld by using identification numbers instead of respondents' names.

### 3.12 Limitations to the Study

These include;

Failure to get timely feedback from some respondents especially those with tight schedules paused a serious challenge to the researcher. To solve this problem, the researcher substituted some of the respondents with new samples willing to volunteer information.

The researcher faced a challenge of some respondents unwilling to participate in the study reason that there was no material benefit. To solve this limitation, the researcher took the initiative of convincing the respondents that the results of this study will have long term benefits including informing policy formulators on the proved best practices.

Bias from the respondents who just filled questionnaires for the sake of filling them to please the researcher. This was overcome by face to face interactions were held to clarify the purpose and objective of the study.

Fear for revealing confidential information as per laid down company polices and categorisation of information as confidential as viewed by the organisations respondents work for. An assuring letter for the University was used to offer assurance to the respondents that the data to be collected is purely for academic purposes.

Inadequate gap free data from one source. This was overcome by moving to different sources or research units.

# CHAPTER FOUR

# PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

## 4.0 Introduction

This chapter presents the analysis and discussion of the primary findings of the study as undertake from the structured questionnaire for the staff of dimension data East Africa and the interview from the selected customers of Dimension Data East Africa and provides answers to the research questions.

The study presents descriptive results from the questionnaire in form of means and standard deviations. It also presents correlations and regressions to show the nature of relationship and magnitude of the effect the independent variable has on the dependent variable.

The chapter also presents the response rate, which shows the number of participants that actually participated in the study. It also presents the background information of the respondents, which shows the common demographic characteristics of respondents that participated in the study.

## 4.1 Response Rate

The study sample size was 76 but 73 respondents actually participated representing a response rate of 96 % in both questionnaires and interviews, others could not participate in study due to their busy schedule hence the above response rate. However, this response rate was well above the recommended 60% as per Guttmacher Institute, (2006) which asserts that for a study to be considered with satisfactory results it should have a response rate above 60% in the overall study. Therefore, readers and users can rely upon the study results for academic and non-academic purposes

## 4.2 Bio data of the respondents

**Table 4.2.1: Gender of respondents**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 61 | 83.6 | 83.6 | 83.6 |
| | Female | 12 | 16.4 | 16.4 | 100.0 |
| | Total | 73 | 100.0 | 100.0 | |

**Source:** *Primary data 2017*

The research findings indicated that there are more male staff in Dimension Data with a percentage of 84% compared to the 16% of the female counterparts. This is however common with many of the enterprise solution IT firms, as the high end technology engineering is still a dominion of the males compared to the females. This however does not have any major effect on the study as the subject under study is not gender specific

**Table 4.2.2: Age of respondents**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | below 25 | 11 | 15.1 | 15.1 | 15.1 |
| | 25-35 | 52 | 71.2 | 71.2 | 86.3 |
| | 36-45 | 8 | 11.0 | 11.0 | 97.3 |
| | 46-55 | 2 | 2.7 | 2.7 | 100.0 |
| | Total | 73 | 100.0 | 100.0 | |

**Source:** *Primary data 2017*

The research findings indicated that the majority of the respondents were between the age of 25 and 35, this is generally because the IT industry is a fast evolving industry requiring re-tooling and recertification which is usually a pressure that moderating young people can cope with. This however does not have any major effect on the study as the subject under study is not age specific.

**Table 4.2.3: Highest academic qualification**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Degree | 59 | 80.8 | 80.8 | 80.8 |
| | Masters | 13 | 17.8 | 17.8 | 98.6 |
| | Professional | 1 | 1.4 | 1.4 | 100.0 |
| | Total | 73 | 100.0 | 100.0 | |

**Source**: Primary data 2017

The research finding also indicated that the majority of the respondents hold a degree as shown by the 80.8%, this is because the company has a bachelor's degree as a minimum standard of entry and the other percentages only indicate higher or addition qualifications possessed by the respondents in the case study. This also highlights the also explains the high rate of response and involvement of respondents in the survey and the interviews.

**Table 4.1.4: Number of years worked in the organization**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 1-2 | 13 | 17.8 | 17.8 | 17.8 |
| | 3-5 | 44 | 60.3 | 60.3 | 78.1 |
| | 5-10 | 13 | 17.8 | 17.8 | 95.9 |
| | 10-15 | 3 | 4.1 | 4.1 | 100.0 |
| | Total | 73 | 100.0 | 100.0 | |

**Source:** Primary data 2017

The research findings also indicated that the larger majority of the respondents had worked with the company for 3 to 5 years and the second large group of respondents had worked with the company for between 1 to 2 years. This indicates that largely staff do not work for the company for a long period. This could be attributed to a generally high level of employee turnover in the IT industry given the highest level of staff poaching among all industries in East Africa.

## 4.2 Findings of the study according to research objectives

### 4.2.1 Findings on the role of requirements gathering and elicitation on information technology project management success

**Table 4.2.1: Descriptive Statistics on requirements gathering and elicitation**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Gap Analysis enables needs assessment helping projects to deliver the right scope | 73 | 2 | 5 | 4.12 | .897 |
| SWOT can exposes areas where project management needs to focus to enable success | 73 | 2 | 5 | 4.18 | .887 |
| Business Analysis use the 5 whys helping in deep understanding of stakeholder needs and better project delivery satisfaction | 73 | 2 | 5 | 4.27 | .870 |
| Brainstorming is as part of business analysis requirement elicitation intended to improves the understanding of scope | 73 | 2 | 5 | 4.22 | .917 |
| PESTLE enables business analysis and project management team to better understand the stakeholders increasing the probability of success | 73 | 1 | 5 | 4.19 | .981 |
| Valid N (listwise) | 73 | | | | |

**Source:** *Primary data (2017)*

The research findings indicated that gap analysis enables needs assessment helping projects to deliver the right scope, this is evidenced by the mean of 4.12 showing a strong acceptance in the result of response. This also came with a standard deviation of 0.897 which showed a variance in opinion generally, however this was within the range of acceptance. As the larger response indicated that gap analysis helps to identify the key aspects that the project and the project manager in general should address and thus form part of the scope. This is equally presented by Project Management Institute (2015) where it is advocated that business analysis techniques like gap analysis should be undertaken to ensure that the full and entire scope of the project is delivered.

The research results also showed that SWOT can expose areas where project management needs to focus to enable success, this is evidenced by the mean of 4.18 showing a high level of strong acceptance from respondents and the standard deviation of 0.887 indicating dispersion in the responses. This showed the size of various in response, highlighting what various respondents thought differently according to their varying experiences. Nevertheless general research evidence indicate that SWOT can expose areas that the Business Analysts and Project Managers needs to focus on to enable success of the projects in the IT industry. The same was re-echoed by Taylor (2004) in his discussion on how business analysis facilitates better project management. Cadle, Paul, &Turner, (2010) front similar arguments in their explanation of how Business Analysts and Project Managers cannot divorce SWOT from the Business Analysis practice of understanding project requirements and needs, which they argue forms the basis of successful implementation and management of IT projects.

Findings indicated that Business Analysts use the 5 whys in helping in the deep understanding of stakeholder needs and better project delivery satisfaction, this shown by the mean of 4.27 a highlight of strong acceptance from respondents. This came at a standard deviation of 0.870 which indicated some degree of variance in opinion and response of the respondents on the item in question. This could be

based on the fact that different individuals have approached the aspect of requirements gathering and elicitation from various angles and thus use varying tools and practices but all appreciate that the 5 whys help in the process of understanding the stakeholder needs and requirements. Thereby creating the well needed ground for IT project management success. Jonasson (2012) in his explanation of requirements Engineering shows that the 5 whys facilitates better understanding of the needs of stakeholders and better satisfaction of delivered projects.

Findings also show that brainstorming as a part of business analysis requirement elicitation intended to improve the understanding of scope as shown by the mean of 4.22; an indication of strong acceptance. This was at a standard deviation of 0.917 which indicated some degree of variance in opinion and response of the respondents on the item in question. This finding is similar to what Ambler (2005) explained when he detailed the role brainstorming sessions play in project scope and overall project management success.

Research finding show that PESTLE enables business analysis and project management team to better understand the stakeholders increasing the probability of success as shown by the mean of 4.19 an indication of strong acceptance and a standard deviation of 0.981 indicating a fairly strong variation in the response on the issue. From the findings it was clear that the respondents agreed that there is a lot of application of PESTLE in business analysis practices in the analysis of requirements and classification of the same requirements to better place and understand how to apply them in the implementation of the projects and how to manage the IT projects based on the identified aspects as revealed from use PESTLE. This finding is similar to what Jugdev & Muller (2005) discussions around the use of PESTLE in Business analysis and how it plays a role in project management success. The two argue that any analysis of any organizational issue is not thorough until one applies PESTLE, this notwithstanding whether a project is IT, Engineering, software based or otherwise.

And from the interview it was found *that 80% of the customers had undertaken requirements gathering though this was in various forms and using various tools and best practices as enshrined in business analysis. According to the interview it was confirmed by the interviewees that it had improved on the project success. From the interview it was seen that undertaking requirements gathering helped the clients take stock of what they need at different levels of prioritization and this helped the clients understand what to install and how to install given the different technologies depending on the requirements that they were aware of after the requirements gathering and elicitation practice of business analysis.*

### 4.2.2: Findings on the role of requirements Analysis and engineering on Information technology project management success

**Table 4.2.2: Descriptive statistics on requirements Analysis and engineering**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Prototyping as a requirements analysis practice highlights the project requirements easing the implementation of the project | 73 | 3 | 5 | 4.15 | .758 |
| Process Modeling deals with what the users should expect at every stage, this helps project management in expectation management | 73 | 2 | 5 | 4.33 | .783 |
| During requirement engineering, requirements are prioritized through MOSCOW enabling project manager focus on the most important aspects | 73 | 3 | 5 | 4.26 | .764 |
| Document analysis in business analysis helps in the cost management of project management leading to success | 73 | 3 | 5 | 4.42 | .644 |
| Analysis practices like weighted ranking help project management consider only the most feasible options. | 73 | 2 | 5 | 4.25 | .894 |
| Valid N (listwise) | 73 | | | | |

**Source:***Primary data (2017)*

The research finding showed that prototyping as a requirements analysis practice highlights the project requirements easing the implementation of the project, this is evidenced by the mean of 4.25 showing a strong acceptance in the result of response. This was with a standard deviation of 0.758, which was an indication of a fairly average variation of the response of the respondents. The varying response was largely because of the various practices different respondents have experienced in their previous projects, nevertheless the agreement was a rather more indicative fact that largely there is agreement especially with software based project to initially prototype a project solution before full detailing and configuration of features can take place to better understand the needs and function. This in most cases and as evidenced by the research leads to more successful IT projects and project management. This is equally presented by Fairley (2009) who fronts prototyping is a core practice of business analysis that creates a foundation for successful project management. Similar scholarly arguments are presented by Forsberg, Mooz, & Cotterman (2005).

Findings also show that Process Modeling deals with what the users should expect at every stage, this helps project management in expectation management his shown by the mean of 4.33 a highlight of strong acceptance from respondents. This was with a standard deviation of 0.783, which was an indication of a fairly average variation of the response of the respondents. This clarity of response as shown by the agreement of the respondents indicated that for most It project process modeling through either simulated modeling or static modeling brings detail at every stage of the project implementation. Scholars like Forsberg, Mooz & Cotterman (2005) in their book Visualizing Project Management explain that advocacy for process modeling is key to business analysis as it ensures success of projects since it brings to the light the risks at every stage of the project and what needs to be done prior and how to avoid any show-stoppers in the deployment of the project. According to him and as evidenced from the research findings saves a lot of It projects and also software projects.

Research finding showed that during requirement engineering, requirements are prioritized through MOSCOW enabling project manager focus on the most important aspects; the respondents asserted this as evidenced by a mean of 4.26 in their response which shows a strong acceptance. This was with a standard deviation of 0.764, which was an indication of a fairly average variation of the response of the respondents. This highlighted an important aspect in Business Analysis that elevates the practice of prioritization. From the findings it was clear that stakeholder may have a variance in opinion even within agreement as seen with the standard deviation. The same concepts applies to needs and requirements thus Business Analysts and Project Managers apply the practice in selecting what requirements to focus on and at what rate. This is equally in confirmation of Davis (2005) explains in his discussions on Software development, the reknown author in software development and how to handle projects of the same, explains that there must be prioritization of software features if a project is to be successful and finalized and he highly recommends the use of MOSCOW.

It was found out that document analysis in business analysis helps in the cost management of project management leading to success, evidenced by a response with a mean of 4.42 which confirms a strong acceptance by respondents, and a standard deviation of 0.644, which was an indication of a fairly average variation of the response of the respondents. This finding is similar to various scholars' arguments including Larson & Larson (2012). In their book on requirements management they discuss that documentation analysis is one of the most popular business analysis as it's a cheaper and less involving practice that can enable the practitioner access a wide range of information which facilities better project management.

Finally it was found out that analysis practices like weighted ranking help project management consider only the most feasible options; this was shown with the strong acceptance rate of a mean of 4.25. This was with a standard deviation of 0.894, which was an indication of a fairly average variation of the

response of the respondents. This is similar to both Lawson (2010) and Leffingwell and Widrig (2003) explanation of business analysis, where they argue that even with a prioritization practice of MOSCOW, practitioners needs to ranks modeled solution where parallel prototypes have been opted for while undertaking testing and development of options. This eventually helps in choice of what project to roll out and mainstream IT project management once the initiation phases are finalized.

From the interview it was found *the client IT departments has undertaken some form of Requirements Analysis using a wide range of tool and practices; this at various levels from being fully granular to being brief according to the various interviewees. And this level of requirement analysis and engineering helped in re-defining the scope and features of the solutions implemented leading to far better success on IT projects. This is because there was clear understanding of what requirements and technological features align with which requirements and features within a particular technology.*

### 4.2.3: Findings on the role of requirements validation and solution evaluation on Information technology project management success

**Table 4.2.3:** Descriptive Statistics on requirements validation and solution evaluation

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Verification of requirements enables base lining which is critical for project success measurement | 73 | 2 | 5 | 4.44 | .781 |
| Stakeholder sign-offs at solution evaluation ensures management commitment which is critical for project success | 73 | 1 | 5 | 4.41 | .742 |
| Requirement traceability leads to better project component delivery | 73 | 2 | 5 | 4.55 | .688 |
| Requirements validation leads to better project solution sizing | 73 | 1 | 5 | 4.32 | .998 |
| Early Business Analysis leads to better testing and Validation of the project | 73 | 2 | 5 | 4.51 | .710 |
| Valid N (listwise) | 73 | | | | |

**Source:** *Primary data (2017)*

Research findings indicated that verification of requirements enables base lining which is critical for project success measurement as shown by the mean of 4.44 a show of strong acceptance from the respondents. This was with a standard deviation of 0.781, which was an indication of a fairly average variation of the response of the respondents. This further affirms the role of validation and evaluation as key business analysis practices in project management success as presented by authors like Paul,

Yeates and Cadle (2010). From this it is clear that practitioners including Business Analysts and Project Managers needs to ensure that a solution is validated against the agreed criteria's and set by the organization and evaluated for feasibility, functionality and for IT end-user systems User-ability and fronted by Yeates and Cadle (2010).

Results also showed that stakeholder sign-offs at solution evaluation ensures management commitment which is critical for project success as shown by the mean of 4.41 which shows strong acceptance from the respondents. This was with a standard deviation of 0.742, which was an indication of a fairly average variation of the response of the respondents. This is equally similarly to the assertion of International Institute of Business Analysis (2015) in the Business Analysis book of Knowledge discussions where they assert sign-off of solution evaluation is a best practice that project managers and business Analysts should adhere to.

As part of the response for the questionnaires the findings also reveal that requirement traceability leads to better project component delivery this was evidenced by the mean of 4.55 which indicates a strong agreement, with a standard deviation of 0.688, which was an indication of a fairly average variation of the response of the respondents. This therefore revealed that Project Managers and Business Analysts can thus use the trace and general practice of the Traceability Matrix to check and cross-check whether the requirements and needs of stakeholders and users of the technologies, and systems are captured in the features or in the configuration and deployment during project implementation. This according to authors like Elliott & Strachan, (2004), is very important to ensure nothing is missed out or misrepresented in the course of the IT projects installations.

This was similar to findings that showed that requirements validation leads to better project solution sizing this was proved by the mean of 4.32 as shown by the response indicating strong acceptance. This was with a standard deviation of 0.998, which was an indication of a fairly average variation of the

response of the respondents. Validation of a solution comes in a wake of confirmation of integration into the IT environment and compatibility of use alongside or with other installed systems. As evidenced and revealed in the research findings implementation of an IT project whose compatibility in terms of version of operating systems and licenses with existing solutions and systems makes it success or an unsuccessful. And thus the need for validation. The same is explained by Ross, and Lam, (2011), in their discussion about business analysis with business rules and the role of requirement traceability to project success.

Results also shows that Early Business Analysis leads to better testing and validation of the project sizing this was proved by the mean of 4.51 as shown by the response indicating strong acceptance. This was with a standard deviation of 0.710, which was an indication of a fairly average variation of the response of the respondents. This revelation highs the fact that undertaking business analysis in the early stages of project formation, helps in coming up with the right size of the project in terms of scope, IT system features. Authors like Cadle, Paul, & Turner, (2010) explain that it's this right sizing in the early business analysis that creates the right foundation for successful IT project management, the same is explained by Lawson (2010) in their discussion about business analysis and system solution validation.

From the interview, it was found that the *client who were undertaking business analysis were able to trace their requirements using either a traceability matrix or Systems needs assessments at every stage of the deployment. The interviewees also noted that stakeholders would inquire on their needs even at the project implementation stage, and it was found that the majority were using the requirements traceability matrix and from most response it was clear that were used this had significantly improved on the success of the IT project management.*

### 4.2.4: Findings on the indicators of success Information technology project management success

**Table 4.2.2: Descriptive statistics on indicators of success of IT Project Management**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Delivery of the required Quality is an indicator of successful IT project management | 73 | 3 | 5 | 4.32 | .668 |
| Delivery of the right scope as a result of proper sizing is an indication of successful IT project management | 73 | 3 | 5 | 4.13 | .683 |
| Timely delivery of Projects is an indicator of successful IT project management | 73 | 3 | 5 | 4.36 | .674 |
| Delivery of Projects with minimum risk leads to successful IT project management | 73 | 3 | 5 | 4.30 | .684 |
| Delivery of Projects within cost as well any cost savings leads to successful IT project management | 73 | 2 | 5 | 4.45 | .474 |
| Valid N (listwise) | 73 | | | | |

**Source:***Primary data (2017)*

The research finding showed that delivery of the required quality as could be specified by the users or project stakeholders is an indicator of successful Information Technology Project Management, this is evidenced by the mean of 4.32 showing a strong acceptance in the result of response. This was with a standard deviation of 0.668, which was an indication of a fairly average variation of the response of the respondents. This is equally presented by Taylor (2004) who argues that for an IT project, quality is everything since the quality of functionality is what everyone looks out for as the tangibility that they

see for the value of the money invested. This thus, being fronted as a key indicated is a typical indication of how important it is in showing show successful the project management function has been.

Findings also show that delivery of the right scope as a result of proper sizing is an indication of successful Information Technology Project Management his shown by the mean of 4.13 a highlight of strong agreement from respondents. This was with a standard deviation of 0.683, which was an indication of a fairly average variation of the response of the respondents. Forsberg, Mooz & Cotterman (2005) in their book Visualizing Project Management equally weighed in with their argument that all wrongs in technology based projects is usually due to scope creep, increasing or decreasing scope is where projects fail according to them. This is evidently shown in the research findings exhibiting the arguments of the scholars.

Research finding showed that timely delivery of Projects is an indicator of successful Information Technology Project Management; the respondents assert this through the mean of 4.36 which shows respondent's strong agreement; this was with a standard deviation of 0.674, which was an indication of a fairly average variation of the response of the respondents. Elliott & Strachan, (2004) in their discussion of the project constraints explain that all project issues stem from time and end with time. They thus argue that time management in It project management is the key indication of successful Information Technology Project Management.

It was found out that delivery of projects with minimum risk leads to successful IT project management, shown by the mean of 4.42 which confirms a strong acceptance by respondents. This was with a standard deviation of 0.684, which was an indication of a fairly average variation of the response of the respondents. This is equally rhyming with scholarly discussions of Larson & Larson (2012), the two argue that all issues on projects culminate from unattended to risks, in their summary argument all project issues or issues that could make a project go wrong stem from and can summarized as risks.

Finally it was found out that delivery of projects within cost as well any cost savings leads to successful IT Project Management; this was shown with the strong acceptance rate of a mean of 4.45. This was with a standard deviation of 0.474, which was an indication of a fairly average variation of the response of the respondents. This is similar to Carkenord, (2008) explanation that all stakeholder's measures of project success boil down to finances and costs, and thus proper cost management and any cost savings will indicate success.

### 4.3: Correlation Analysis

**Table 4.3.1: Correlation between requirements gathering & elicitation and success of ITPM**

| | | Requirements gathering | Success of ITPM |
|---|---|---|---|
| Requirements gathering | Pearson Correlation | 1 | .802** |
| | Sig. (2-tailed) | | .000 |
| | N | 73 | 73 |
| Success of ITPM | Pearson Correlation | .802** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 73 | 73 |

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Primary data (2017)

The research findings indicated that there is a strong positive relationship between requirements gathering and the success of IT project management is this shown by the correlation coefficient of 0.802 with a Sig. = 000 which means any efforts in requirements gathering as an aspect of Business Analysis leads to better and more success IT project management. This also rhymes with the various authors including Lawson (2010) and Beedle et al (2009) who explain that the success of IT project and their overall management greatly depends on this requirement gathering practice of business analysis

**Table 4.3.2: Correlation between requirements analysis & engineering and success of ITPM**

| | | Requirements analysis & engineering | Success of ITPM |
|---|---|---|---|
| Requirements analysis & engineering | Pearson Correlation | 1 | .711** |
| | Sig. (2-tailed) | | .000 |
| | N | 73 | 73 |
| success of ITPM | Pearson Correlation | .711** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 73 | 73 |

**. Correlation is significant at the 0.01 level (2-tailed).

**Source:** Primary data (2017)

The research findings indicated that there is a strong positive relationship between requirements analysis and engineering and the success of IT project management is this shown by the correlation coefficient of 0.711 with a sig = 000, which means that all efforts in Requirements analysis and engineering would lead to more successful IT Project management. This was equally presented by Project Management Institute (2015) and Blais (2011) explaining that the success of IT project management greatly depends on this requirements analysis and engineering practice of business analysis

**Table 4.3.3: Correlation between requirements validation & solution evaluation and success of ITPM**

| | | Requirements validation & solution evaluation | Success of ITPM |
|---|---|---|---|
| Requirements validation & solution evaluation | Pearson Correlation | 1 | .783** |
| | Sig. (2-tailed) | | .000 |
| | N | 73 | 73 |
| Success of ITPM | Pearson Correlation | .783** | 1 |
| | Sig. (2-tailed) | .000 | |
| | N | 73 | 73 |

**. Correlation is significant at the 0.01 level (2-tailed).

**Source:** Primary data (2017)

The research findings indicated that there is a strong positive relationship between requirements validation and solutions evaluation and the success of IT project management is this shown by the correlation coefficient of 0.783 with a sig = 000, meaning that any practice in requirements validation and solutions evaluation as part of Business Analysis leads to successful IT project management. This is similar to what International Institute of Business Analysis (2015) and Frisendal (2012) explain, in their literature it was discussed that success of IT project management greatly depends on this requirements validation and solutions evaluation practice of business analysis.

**4.4: Regression Analysis**

**Table 4.4.1: Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.002E-013 | .060 | | .000 | 1.000 |
| | Requirements gathering & elicitation | .443 | .099 | .443 | 4.475 | .000 |
| | Requirements analysis & engineering | .102 | .097 | .102 | 1.048 | .298 |
| | Requirements validation & solution evaluation | .410 | .087 | .410 | 4.694 | .000 |

a. Dependent Variable: Information Technology Project Management Success

**Source:** Primary data (2017)

The findings in table 4.4.1 above revealed that requirements gathering was the best predictor of success of IT project management (Beta = 0.443) followed by Requirement validation and solutions evaluation (Beta = 0.410), and the least being requirements analysis and engineering which is presented with (Beta = 0.311). This therefore means that requirement gathering and elicitation is the most determining factor for IT project management success, this is also followed by the moderating determining factor of

requirements validation and evaluation. And the lesser determining factor of requirements analysis and engineering.

### 4.6: Summary of the research findings

It was found that there is an evidently strong relationship between Requirements gathering and elicitation and the success of IT project management as shown by the correlation coefficient of 0.802; with highlight of the various roles of that requirements gathering and elicitation play in the success of IT project management as discussed above.

Also results indicated that there is a clear strong relationship between Requirements analysis and engineering and the success of IT project management shown by the correlation coefficient of 0.711; with highlight of the various roles of that requirements analysis and engineering play in the success of IT project management as discussed by the researcher in the research findings interpretation

Research also revealed that a relationship between Requirements validation and solutions evaluation and the success of IT project management as shown by the correlation coefficient of 0.783; with highlight of the various roles of that requirements validation and solutions evaluation play in the success of IT project management as interpreted by the researcher in the statistical interpretation of the objective findings.

# CHAPTER FIVE

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 5.0 Introduction

This chapter presents the summary, conclusions, and recommendations of the findings that are presented according to the study objectives.

## 5.1 Summary of key findings

### 5.1.1 The role of requirement gathering and elicitation on the success of IT project management

In summary the research findings indicated that Gap Analysis enables needs assessment helping projects to deliver the right scope, also showed that SWOT can exposes areas where project management needs to focus to enable success. Findings indicate that Business Analysis use the 5 whys helping in deep understanding of stakeholder needs and better project delivery satisfaction, also indicating that brainstorming is as part of business analysis requirement elicitation intended to improve the understanding of scope and finally revealed that PESTLE enables business analysis and project management team to better understand the stakeholders increasing the probability of success.

The study findings that there is a strong positive relationship between requirements gathering and the success of IT project management is this shown by the correlation coefficient $r = 0.802^{**}$, significant at $p< 0.00$ with $N = 73$ number of respondents

### 5.1.2 The role of requirement analysis and engineering on the success of IT project management

In summary the research finding showed that prototyping as a requirements analysis practice highlights the project requirements easing the implementation of the IT projects, also indicating that Process

Modeling deals with what the users should expect at every stage, this helps project management in expectation management. Research finding also showed that during requirement engineering, requirements are prioritized through MOSCOW enabling project manager focus on the most important aspects and that document analysis in business analysis helps in the cost management of project management leading to success. Finally it was found out that analysis practices like weighted ranking help project management consider only the most feasible options.

The study findings revealed a very strong positive relationship between requirement analysis and engineering and the success of IT project management with correlation coefficient $r = 0.711^{**}$, significant at $p<0.01$ with $N = 73$ number of respondents.

### 5.1.3 The role of requirement validation and solution evaluation on the success of IT project management

In summary research findings indicated that verification of requirements enables base lining which is critical for project success measurement, also showed that stakeholder sign-offs at solution evaluation ensures management commitment which is critical for project. As well findings also reveal that Requirement traceability leads to better project component delivery, in addition to the fact that requirements validation leads to better project solution sizing and finally that early Business Analysis leads to better testing and Validation of the project.

The study findings revealed a strong positive relationship between requirement validation and solution evaluation and the success of IT project management with correlation coefficient is $0.783^{**}$, significant at $p< 0.01$ with $N = 73$ number of respondents.

## 5.2 Conclusions

### 5.2.1 The role of requirement gathering and elicitation on the success of IT project management

In conclusion the research depicted that the very strong correlation coefficient of 0.802**, imply that requirement gathering and elicitation plays a major role in the success of IT project management. The practices of requirement gathering and elicitation improves the practice and success of IT project Management

### 5.2.2The role of requirement analysis and engineering on the success of IT project management

In conclusion the research depicted that the very strong correlation coefficient of 0.711**, imply that requirement analysis and engineering plays a major role in the success of IT project management. The practices of requirement analysis and engineering improves the practice and success of IT project Management

### 5.2.3 The role of requirement validation and solution evaluation on the success of IT project management

In conclusion the research depicted that the very strong correlation coefficient of 0.783**, imply that requirement validation and solutions evaluation plays a major role in the success of IT project management. The practices of requirement validation and solution evaluation improves the practice and success of IT project Management

## 5.3 Recommendation

Based on the research undertaken, the study findings, discussions and conclusions, the following recommendations were made by the researcher

### 5.3.1 The role of requirement gathering and elicitation on the success of IT project management

Business analysis should always undertake well detailed requirement gathering and elicitation after the due required stakeholder analysis. This would help in generating the required detailed needs, requirement and associated risks which creates the foundation of project management especially when it comes to software and any tailor made IT solution, since this creates the basis of what the project delivers and in totality the success of IT project management

### 5.3.2 The role of requirement analysis and engineering on the success of IT Project Management

Also in ensuring the success of IT project management, Business Analysis should work with IT & engineering Project managers in ensuring detailed Requirements analysis in the Project initiation phases and planning phases. Thorough scrutiny of the requirements should be undertaken using a mixture of more than 3 tools to achieve maximum granularity of the requirements for the success of the project.

### 5.3.3 The role of requirement validation and solution evaluation on the success of IT project management

It is also very crucial for Business Analysts and Project Managers to evaluate the solution and to validate the requirement through tools like prototyping. Before solutions deployment, both the project manager and the business analysis should prep the solution before integrating it into the inter

environment. This would include testing every aspect of the solution, the features and using the traceability matrix check the requirements with the actual user requirement and the feasibility of the same.

## 5.4 Areas for further research

- The role of resource skills in the success of IT project management success.
- The role of Business Analysis on organizational performance
- The role of Business Analysis in change management in modern day organizational evolution.

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## Appendices 1 Questionnaire

## QUESTIONNAIRE TO THE RESPONDENTS IN DIMENSION DATA EA

Dear respondents, I am Ronald K Ssekajja Reg No 2015_M102_20127 a Graduate student of Uganda Martyrs University pursuing a Master's Degree in Business Administration. This research is purely intended for academic reasons only. Please spare time and provide response to the questionnaire all submissions will be treated with utmost **confidentiality.**

**BACKGROUND INFORMATION (Please tick as appropriate)**

**a) Highest Academic qualification of the respondent**

| High School | Diploma | Degree | Masters | Professional | Other Specify |
|---|---|---|---|---|---|
| | | | | | |

**b) Age of respondent**

| Below 25 years | 23 – 35 years | 36 – 45 years | 46 – 55 years | Above 55 years |
|---|---|---|---|---|
| | | | | |

**c) Sex of the respondent**

| Male | Female |
|---|---|
| | |

**d) Number of years worked in the Dimension Data**

| 1-2 | 3-5 | 5-10 | 10-15 | 15 and above |
|---|---|---|---|---|
| | | | | |

**e) Number of employees in Department**

| Below 4 employees | 5 – 50 employees | More than 50 employees |
|---|---|---|
| | | |

Here tick where appropriate

**(SD**-Strongly Disagree-[1]**D**-Disagree-[2] **NA**-Not Aware [3]**A**-Agree [4]**SA**-Strongly Agree [5])

**SECTION B:**

**The role of requirements gathering and elicitation on Information technology project management success**

| Code | **Description** | **SD** | **D** | **NA** | **A** | **SA** |
|---|---|---|---|---|---|---|
| RG1. | Gap Analysis enables needs assessment helping projects to deliver the right scope | | | | | |
| RG2. | SWOT can exposes areas where project management needs to focus to enable success | | | | | |
| RG3. | Business Analysis use the 5 whys helping in deep understanding of stakeholder needs and better project delivery satisfaction | | | | | |
| RG4 | Brainstorming is as part of business analysis requirement elicitation improves the understanding of scope | | | | | |
| RG5 | PESTLE enables from the business analysis out the project management team to better understand the stakeholders increasing the probability of success | | | | | |

**The role of requirements Analysis and engineering on Information technology project management success**

| code | **Description** | **SD** | **D** | **NA** | **A** | **SA** |
|---|---|---|---|---|---|---|
| RA1. | Prototyping as a requirements analysis practice highlights the project requirements easing the implementation of the project | | | | | |
| RA2. | Process Modeling as a requirements engineering practice deals out what the users should expect at every stage, this helps project management in expectation management | | | | | |
| RA3. | During requirement engineering requirements are prioritized through MOSCOW enabling project manager focus on the most important aspects | | | | | |
| RA4. | Document analysis in business analysis helps in the cost management of project management leading to success | | | | | |
| RA5 | Analysis practices like weighted ranking help project management consider only the most feasible options at implementation | | | | | |

**The role of requirements validation and solution evaluation on Information technology project management success**

| Code | **Description** | **SD** | **D** | **NA** | **A** | **SA** |
|---|---|---|---|---|---|---|
| RV1. | Verification of requirements enables baselining which is critical for project success measurement | | | | | |
| RV2. | Stakeholder sign-offs at solution evaluation ensures management commitment which is critical for project success | | | | | |
| RV3. | Requirement traceability leads to better project component delivery | | | | | |
| RV5 | Requirements validation leads to better project solution sizing | | | | | |
| RV6 | Early Business Analysis leads to better testing and Validation of the project | | | | | |

**Section E Success of IT Project Management**

| | | SD | D | NA | A | SA |
|---|---|---|---|---|---|---|
| ITPM 1 | Delivery of the required Quality is an indicator of successful IT project management | | | | | |
| ITPM 2 | Delivery of the right scope as a result of proper sizing is an indication of successful IT project management | | | | | |
| ITPM 3 | Timely delivery of Projects is an indicator of successful IT project management | | | | | |
| ITPM 4 | Delivery of Projects with minimum risk leads to successful IT project management | | | | | |
| ITPM 5 | Delivery of Projects within cost as well any cost savings leads to successful IT project management | | | | | |

**Your cooperation is highly appreciated**

**Appendices 2 Interview Guide**

**INTERVIEW GUIDE FOR CLOSED PROJECTS & BUSINESS ANALYSIS SESSIONS CLIENTS' SENIOR MANAGEMENT OF DIMENSION DATA**

**SECTION A:**

**The role of requirements gathering and elicitation on the success of IT project management**

1. Has your organization undertaken any requirement gathering and elicitation?

……..

……..

……..

2. How has this improved the related project implementation?

……..

……..

……..

**SECTION B:**

**The role of requirement analysis and engineering on the success of IT project management**

3. Has your technical departments undertaken any form of requirements analysis and engineering?

……..

……..

……..

4. How has this improved the detail of solution scoping and general project management?

……..

……..

……..

**SECTION C:**

**The role of requirements traceability and solutions evaluation on the success of IT Project Management**

5. Are you able to trace your requirements during the process of project implementation and management?

……..

……..

……..

6. What tools do you use for both traceability and solution evaluation?

……..

……..

……..

**SECTION D:**

**The Role of Business Analysis in IT Project Management**

7. Has efforts put on business analysis delivered a better delivered project?

……..

……..

……..

8. Would you recommend that other corporate bodies should ensure that business analysis is part of the project management of information technology projects?

……..

……..

……..

**Thank you for your Time**

## Appendices 3- Sample size selection

Table 3.1

*Table for Determining Sample Size of a Known Population*

| N | S | N | S | N | S | N | S | N | S |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 10 | 100 | 80 | 280 | 162 | 800 | 260 | 2800 | 338 |
| 15 | 14 | 110 | 86 | 290 | 165 | 850 | 265 | 3000 | 341 |
| 20 | 19 | 120 | 92 | 300 | 169 | 900 | 269 | 3500 | 346 |
| 25 | 24 | 130 | 97 | 320 | 175 | 950 | 274 | 4000 | 351 |
| 30 | 28 | 140 | 103 | 340 | 181 | 1000 | 278 | 4500 | 354 |
| 35 | 32 | 150 | 108 | 360 | 186 | 1100 | 285 | 5000 | 357 |
| 40 | 36 | 160 | 113 | 380 | 191 | 1200 | 291 | 6000 | 361 |
| 45 | 40 | 170 | 118 | 400 | 196 | 1300 | 297 | 7000 | 364 |
| 50 | 44 | 180 | 123 | 420 | 201 | 1400 | 302 | 8000 | 367 |
| 55 | 48 | 190 | 127 | 440 | 205 | 1500 | 306 | 9000 | 368 |
| 60 | 52 | 200 | 132 | 460 | 210 | 1600 | 310 | 10000 | 370 |
| 65 | 56 | 210 | 136 | 480 | 214 | 1700 | 313 | 15000 | 375 |
| 70 | 59 | 220 | 140 | 500 | 217 | 1800 | 317 | 20000 | 377 |
| 75 | 63 | 230 | 144 | 550 | 226 | 1900 | 320 | 30000 | 379 |
| 80 | 66 | 240 | 148 | 600 | 234 | 2000 | 322 | 40000 | 380 |
| 85 | 70 | 250 | 152 | 650 | 242 | 2200 | 327 | 50000 | 381 |
| 90 | 73 | 260 | 155 | 700 | 248 | 2400 | 331 | 75000 | 382 |
| 95 | 76 | 270 | 159 | 750 | 254 | 2600 | 335 | 1000000 | 384 |

*Note: N is Population Size; S is Sample Size* *Source: Krejcie & Morgan, 1970*

## Appendices 4- University Authorization Letter to undertake Field Research

Uganda Martyrs University

making a difference

**Office of the Dean**
**Faculty of Business Administration and Management**

*Your ref.:*
*Our ref.:*

Nkozi, 6th September 2017

Dear Sir/Madam,

**Re: Research Work Assistance**

Greetings from Uganda Martyrs University.

This is to introduce RONALD K. SSEKAIJJA who is a student of this University. As part of the requirements for the award of the Master of Business Administration of this University, the student is required to carry out field research as part of the dissertation to conclude the programme.

I therefore request you to render the student such assistance as may be necessary and conduct the research.

Thank you in advance.

Yours Sincerely,

Dr. Sr. Marie Nakitende
**Dean**

UGANDA MARTYRS UNIVERSITY OFFICE OF THE DEAN 06 SEP 2017 P. O. BOX 5498, KAMPALA FACULTY OF BUSINESS ADMINISTRATION AND MANAGEMENT

Uganda Martyrs University P.O. Box 5498 - Kampala - Uganda
Tel: (+256)038-410603 Fax: (+256) 038-410100 E-mail: bam@umu.ac.ug

## Appendices 5- Dimension Data Letter of authorization to undertake Research

dimension data

8th September 2017

Ronald K Ssekajja
Project Manager
Kampala – Uganda

Dear Sir,

**RE: Acceptance of your request to undertake academic research**

Reference made to your email dated 7th September 2017 to the Human Resources Department with attention to the officer in charge of training and staff department. We hereby accept your request

Our Professional and academic policy referred; it's our company responsibility to assist staff to progress in both professional and academic endeavors especially where the progress is in line with their professional placement in the company.

Also note that this has been integrated in the Dimension Data University (SA) training profile and a copy of the final research should be submitted to us and the DDU external training officer and the Project Management Institute as required by the PMI code.

A hard copy of being availed for university submission.

Sincerely,

**Fiona Njoroge**
**HR- Training & Professional Development Officer**

Registered Office: Telephone +256 (794) 313152/3
5th Floor, EADB Building, Nile Avenue, Kampala
PO Box 27957, Kampala, Uganda
(Co. Registration Number: C41183)

NTT Group