ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE

AN ASSESSMENT OF SUCCESS AND FAILURE FACTORS OF PROJECT: A CASE ON INFORMATION NETWORK SECURITY AGENCY

BY
ABAYNEH MULUGETA

MARCH 2014
ADDIS ABABA, ETHIOPIA

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APPROVED BY THE BOARD OF EXAMINERS

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Dean, Graduate Studies	Signature
_____	_____
Advisor	Signature
_____	_____
Internal Examiner	Signature
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External Examiner	Signature

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I would never have been able to finish my research without the guidance of my advisor, help from friends, and support from my family.

First and foremost I would like to gratefully and sincerely thank, appreciate and express my deepest gratitude to my advisor, Dr. Temesegen Belay*, for his contributions of time, ideas, support, excellent guidance, patience, suggestions and providing me with an exceptional criticism on the research. I thank you*

Secondly, I would like to thank Information Network Security Agency (INSA) management and project management staffs, and Faculty of Business at SMU.

Finally, and most importantly, I would like to thank my family for all their encouragement, support, patience and unwavering love. My research would not have been possible without your help.

Thank you.

This research is dedicated to those guys who have stake on me.

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List of Abbreviations and Acronyms

INSA: Information Network Security Agency

PRINCE: Project Management in a Controlled Environment

PMBOK: Project Management Book of Knowledge

CPM: Critical Path Method

PERT: Project Evaluation and Review Technique

RAD: Requirement Analysis Document

RFP: Request for Proposal

ISO: International Organization for Standardization

TQM: Total Quality Management

MRP: Material requirement planning

PMI: Project Management Institute

ARPANET: Advanced Research Projects Agency Network

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Abstract

This study is about assessing factors which are critical to project success and factors which will contribute to project failure in Information Network Security Agency (INSA). It is a descriptive research. The target population of the study was the project managers of the case company. The total projects of the Agency was around one hundred twenty five (125), the researcher uses ninety six(96) projects which covers 76.8% of the total projects at 95% confidence level. The response rate is 97.92%. In order to gather the primary data, self administered questionnaire and focus group discussion are employed, and after collecting adequate and enough data tabulation methods are used for analysis propose and in order to generate these categorized data statistical package for social science (SPSS) IBM version 20 was used. Major findings of the study revealed that there is poor communication and coordination with customers and other stakeholders; limitations on quality planning; control and assurance; limitations on risk and human resource management; absences of domain experts and well defined project acceptance criterion. Because of these factors majority of the projects are not successfully delivered as per project success criteria. The critical success factors for the Agency projects are hard working and competent staff, and top management support. Based on those major findings and the conclusions some recommendations are given which can enable the Agency to transformation to be effective and efficient in successfully deliver its projects.

CHAPTER ONE

INTRODUCTION

This chapter deals with background of the study, definition of key terms, statement of the problem, research hypotheses, research objectives, significance of the study, scope of the study, limitation of the study and organization of the study.

1.1. Background of the Study

According to (Kerzner, 2009), a project is any series of activities and tasks that have a specific objective with defined specifications, start and end dates, funding limits, use resources (like human, financial) and they are multifunctional which many they cut across several functional lines. Therefore since all projects include the above characteristic they need close supervision in order to deliver successfully. Successful project management can be defined as finalizing and achieving the project objectives within time and cost, at the desired performance/technology level, while utilizing the assigned resources effectively and efficiently, and most importantly the project should be accepted by the customer (Kerzner, 2009). Therefore any project which is finalized with time-overrun or cost-overrun or which didn't meet the desired performance level or most importantly which didn't accepted by the customer is not successful. Therefore close supervision is necessary for project success.

Information Network Security Agency (INSA) is a governmental agency in Ethiopia. It was established in 2005 G.C and re-established under the re-establishment regulation number 250/2011 by the council of ministers. According to the regulation the agency has two main objectives; the first one is '*to defend and take counter measures against information attacks targeted at the national interest'* and the second is *'to ensure the security of information and information infrastructures to facilitate their use for the implementation of the country's peace, democracy, good governance and development programs'*. (INSA re-establishment regulation number 250/2011*)*

Information Network Security Agency has more than one thousand (1,000) employees with an expertise of different educational background, like engineering, computer science, social science fields, and technical personals; and from different lifestyle and cultural background.

In order to achieve its objectives the agency does different projects for different governmental organizations. The projects may be software development, hardware programming, networking, network security and so on.

1.2. Statement of the Problem

A project is a complex, non routine, one-time effort limited by time, budget, resources, and performance specifications design to meet customer needs (Gray and Larson, 2008). Every project is conducted to solve some kind of problem for an organization. According to J. P. Gittinger projects are the cutting edge of development; indicating the significant importance of projects as instruments for development. Project performance can be measured and evaluated using a large number of performance indicators that could be related to various dimensions such as time, cost, quality, client satisfaction, client changes, business performance, health and safety (Cheung, 2004). Time, cost and quality are, however, the three principal performance evaluation dimensions. Another interesting way of evaluating project performance is through two common sets of indicators (Pheng and Chuan, 2006). The first set is related to the groups of people, who will look at project performance from the macro viewpoint. This group includes the owner, users, stakeholders, and the general public. The second set is related to the groups of people who will look at project performance from the micro viewpoint. The developer and the contractor are comprises in this group.

Project performance dimensions may have one or more indicators, and could be influenced by various project characteristics. Dissanayaka and Kumaraswamy (1999) found that project time and cost performances get influenced by project characteristics, procurement system, project team performance, client representation's characteristics, contractor characteristics, design team characteristics, and external conditions. Similarly, Iyer and Jha (2005) identified many factors as having influence on project cost performance, these include: project manager's competence, top management support, project manager's coordinating and leadership skills, monitoring and feedback by the participants, decision making, coordination among project participants, owners' competence, social condition, economic condition, and climatic condition. Coordination among project participants, however, was identified as the most significant of all the factors, having maximum influence on cost performance. Interestingly, Love et al.(2005) examined project time-cost performance relationship, and their results indicate that cost is a poor predictor of time performance.

Project management is a set of principles, methods, and techniques that people use to effectively plan and control project work. It establishes a sound basis for effective planning, scheduling, resourcing, decision making, controlling, and re-planning. Project management principles and techniques help complete projects on schedule, within budget, and in full accordance with project specification. At the same time, they help achieve the other goals of the organization, such as productivity, quality, and cost effectiveness. The objective of project management is to optimize project cost, time, and quality (Larry, 2002). According to Kerzner, (2009) project management involves five process grouped as project initiation, project planning, project execution, project monitoring and control, and finally project closure. These five major processes include different pieces of tasks within them.

Project management is a set of tools, techniques, and knowledge that, when applied, helps to achieve the three main constraints of scope, cost and time (Charvat, 2003). However, based on literatures, 52.7% of projects were not able to complete on time and over cost, and 31.1% not fulfilled the scope. (Charvat, 2003 and Clancy, 1995)

Since there are many projects in the organization they need close supervision and have to be managed in a way that they could be successful. But at this time there are some difficulties in delivering projects as proposed. Therefore this research will contribute some positive outcomes for the successful implementation and delivery of the projects.

1.3. Research Questions

The research paper tries to answer the following research questions

- What factors are critical to project success?
- What factors will contribute to the failure of project?
- What project management methodologies & practices were implemented by the organization?
- What risk management practice is implemented by the management?
- What challenges were faced by the management in implementation of the projects?

1.4. Objectives of the Study

The objectives of the study are to:

- Assess factors which were critical to project success and factors which were contribute to project failure
- Assess the project management methodologies & practices which were implemented by the organization.
- Assess the risk management practice and challenges faced by the management in implementation of the projects.

1.5. Significance of the Study

The finding of the study will help the organization by providing tangible and concrete evidence regarding the developed objectives and the results of the research. These will help the company to design its strategy for the successful completion of its projects and will help the company to deliver the projects to its customer as per the agreed time, quality, scope and other parameters.

Moreover, the outputs will help project management practitioners by showing in which points they should give due emphasis when they implement their projects and also policy makers and professionals will also be the beneficiaries of the result (output).

1.6. Delimitation/Scope of the Study

The scope of the study is delimited to commercial projects of the organization because information related to national security projects is not allowed to be used for such kind of researches. Also the organization is doing its projects to government and public organizations all over the country. Therefore, it would be good and helpful to include all the necessary information to make the research complete, but it was difficult for the researcher to see the customers' response of the whole projects including those projects done for organizations located out of Addis Ababa which needs huge amount of money and a long period of time. Therefore, from the commercial projects the researcher only focus on those projects done to government and public organizations which is located in Addis Ababa City Administration. Regarding to the time span, all projects starting from the establishment of the organization is included in the population of the study.

1.7. Organization of the Study

This paper is organized in four sections or chapters. The first chapter is the introduction part of the study and it includes background of the study, statement of the problem, research questions, objective, significance, scope, limitation and finally organization of the study. The second chapter is all about review of literature, these literatures are important and bases for the research as a whole. The third chapter is going to be about research design and methodology. These includes research design, population and sampling techniques, types of data and tools which is going to be used for data collection, procedures of data collection and finally methods of data collection. The fourth chapter includes data presentation, analysis and interpretation section and the last chapter, chapter five, deals with summary, conclusion and recommendation of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Related literature review is just the written information that could have a relation or relevance to the specific topic of the study. This will support and inform the subject the study is covering. Therefore, this chapter presents the theoretical and empirical literatures, and concepts related with the topic of the study.

2.1 Theoretical Literature

2.1.1 Project

A project can be considered to be any series of activities and tasks that have a specific objective to be completed within certain specifications, defined start and end date, funding limits, uses resources and are multifunctional (Kerzner, 2009). Therefore, from different scholars' point of view we can conclude that a project is a temporary organization or endeavor that is created for the purpose of delivering one or more unique business product, service or result according to an agreed business case. And it is an undertaking designed to examine present practice, to propose change and to test the implementation of change. Project management book of knowledge (PMBOK) (2000) defines project as a temporary endeavor undertaken to create a unique product or service. As per PMBOK temporary means that every project has a definite beginning and definite ending, and unique means that the products or services produced in one project is deferent in some distinguishing way from all other products or services produced in another project.

Lientz and Rea, describes project as an organized method for reaching specific goals and planned benefits within a target schedule and defined budget. (Bennet P. Lientz and Kathryn P. Rea) As per this definition organized method is referred as the project management approach; specific goals are the business, organizational, technological, physical, cultural, and political goals of the project; planned benefits can be financial, political, organizational, cultural, or any of many categories; target schedule and defined budget are aims of the project management approach. Therefore, a project is a group of activities that have to be performed with limited resources to yield specific objectives, in a specific time, and in a specific locality.

Generally, project is done only one time and if it is repetitive it is not a project. By saying temporary it means that every project has a definite beginning and end. Unique means that product, service or result is different in some way from all similar product, service or result. In short projects are

directed towards achieving a specific result, Coordination of undertaking of interrelated activities, of limited duration, a beginning and an end and vulnerable to risks.

2.1.2 Project Management

Many have attempted to define project management in different way from different perspectives. As indicated in the international journal of project management written by Roger Atkinson (1999), Oisen, had been make one of the early attempts.

> *Project Management is the application of a collection of tools and techniques (such as the CPM and matrix organization) to direct the use of diverse resources toward the accomplishment of a unique, complex, one-time task within time, cost and quality constraints. Each task requires a particular mix of these tools and techniques structured to fit the task environment and life cycle (from conception to completion) of the task.*

In the definition some of the success criteria are included, the iron triangle, time, cost and quality. From the figure below we can understand that there are three main interdependent constraints for every project; time, cost and scope. This is also known as Project Management Triangle. Time is a crucial factor which is uncontrollable. A project's activities can either take shorter or longer amount of time to complete. Completion of tasks depends on a number of factors such as the number of people working on the project, experience, skills, etc. Failure to meet the deadlines in a project can create adverse effects. Most often, the main reason for organizations to fail in terms of time is due to lack of resources. It is very important for both the project manager and the organization to have an estimated cost when undertaking a project. Sometimes, project managers have to allocate additional resources in order to meet the deadlines with a penalty of additional project costs. Scope looks at the outcome of the project undertaken. This consists of a list of deliverables, which need to be addressed by the project team. A successful project manager will know to manage both the scope of the project and any change in scope which impacts time and cost. Quality is not a part of the project management triangle, but it is the ultimate objective of every delivery. Hence, the project management triangle represents implies quality. Many project managers are under the notion that 'high quality comes with high cost', which to some extent is true. By using low quality resources to accomplish project deadlines does not ensure success of the overall project.

Figure 1: project management triangle

Moreover the British Standard for project management BS60794 1996 as sited in Atkinson, 1999, defined project management as: "*The planning, monitoring and control of all aspects of a project and the motivation of all those involved in it to achieve the project objectives on time and to the specified cost, quality and performance."*

PRINCE2 project management methodology (2009) defines project management as the planning, delegating, monitoring and control of all aspects of the project, and the motivation of those involved, to achieve the project objectives within the expected performance targets for time, cost, quality, scope, benefits and risks. Moreover Project Management Book of Knowledge (PMBOK) (2000) defines project management as the application of knowledge, skills, tools and techniques to project activities to meet project requirements. As per the guide project management is accomplished through the use of the processes such as initiating, planning, executing, controlling and closing. In addition Reiss as sited in Atkinson (1999) suggests a project is a human activity that achieves a clear objective against a time scale, and to achieve this while pointing out that a simple description is not possible, suggests project management is a combination of management and planning and the management of change.

Project management is the discipline of organizing and managing resources in such a way that these resources deliver all the work required to complete a project within defined scope, time, and cost constraints. It is important to note here that a project is a temporary and one-time endeavor undertaken to create a unique product or service that brings about beneficial change or added value. This property of being a temporary and one-time undertaking contrasts with processes, or operations, which are permanent or semi-permanent ongoing functional work to create the same product or service over and over again. The management of these two systems is often very different and requires varying technical skills and philosophy, hence requiring the development of project management.

Thus, in this regard, the first challenge of project management is ensuring that a project is delivered within the defined constraints. The second, more ambitious, challenge is the optimized allocation and integration of the inputs needed to meet those pre–defined objectives. The project management, therefore, is a carefully selected set of activities chosen to use resources (money, people, materials, energy, space, provisions, communication, quality, risks, etc.) in order to meet the objectives established by the organization.

Management is the attainment of organizational goals in an effective and efficient manner through planning, organizing, leading, and controlling organizational resources. This definition holds two important ideas: one is the four functions of planning, organizing, leading, and controlling, and the other one it the attainment of organizational goals in an effective and efficient manner. Therefore management in any project is concerned with productivity. This refers to efficiency and effectiveness. In order to be efficient, management is concerned with minimizing resource costs. Efficiency is "doing things right". In order to be effective, management is concerned with getting activities completed. Effectiveness is "doing right things". Thus, efficiency is concerned with means and effectiveness with ends. They are interrelated. It is easier to be effective if one ignores efficiency. For example, some organizations are reasonably effective, but are extremely inefficient. They get their jobs done, but at a very high cost. For the management of any project, it is important not only to get the activities completed (effectiveness), but also to do so as efficiently as possible.

As indicated by Stephen and Coulter (2012), Henry Mintzberg, a well-known management researcher, the term managerial roles refers to specific actions or behaviors expected of and exhibited by a manager. As per Mintzberg managerial roles should be looked from the perspective of the expectations and responsibilities that are associated with being the person in that role—the role of a manager. There are 10 roles that are grouped around interpersonal relationships, the transfer of information, and decision making. The interpersonal roles are ones that involve people (subordinates and persons outside the organization) and other duties that are ceremonial and symbolic in nature. The three interpersonal roles include figurehead, leader, and liaison. The informational roles involve collecting, receiving, and disseminating information. The three informational roles include monitor, disseminator, and spokesperson. Finally, the decisional roles entail making decisions or choices. The four decisional roles include entrepreneur, disturbance handler, resource allocator, and negotiator.

Also there are some skills which are needed by all managers in accordance with their role and responsibility. As indicated in the book written by Stephen and Coulter (2012), Robert L. Katz

proposed that managers need three critical skills in management. They are technical skill, human skill, and conceptual skills.

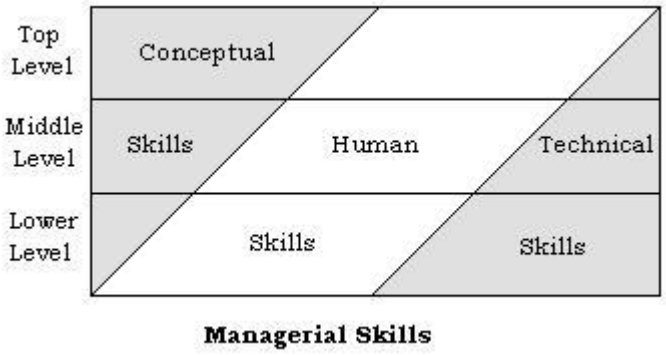

Figure 2: The relationships of managerial skills to managerial levels

According to Robert L. Katz, **Technical skills** are the job specific knowledge and techniques needed to proficiently perform work tasks. These skills tend to be more important for first-line managers because they typically are managing employees who use tools and techniques to produce the organization's products. **Human skills** involve the ability to work well with other people both individually and in a group. Since all managers deal with people, these skills are equally important to all levels of management. Managers with good human skills get the best out of their people. **Conceptual skills** are skills managers use to think and to conceptualize about abstract and complex situations. Using these skills, managers see the organization as a whole, understand the relationships among various subunits, and visualize how the organization fits into its environment. These skills are most important to top managers.

According to Kerzner (2009) project management involves five process grouped as project initiation, project planning, project execution, project monitoring and control, and finally project closure. Kerzner classifies the five major processes in to different pieces, like

- **Project initiation:** in these stage activities like selection of the best project given resource limits, recognizing the benefits of the project, preparation of the documents to sanction the project and assigning of the project manager are expected to be done.

- **Project planning:** in these stage activities like definition of work requirements, the quality and quantity of work and the resources needed. Also scheduling the activities and evaluation of the various risks are expected to be done.

- **Project execution:** negotiating for the project team members, directing and managing the work and working with the team members to help them improve.
- **Project monitoring and control:** tracking progress, comparing actual outcome to predicted outcome, analyzing variances and impacts, and making adjustments
- **Project closure:** verifying that all of the work has been accomplished, contractual closure of the contract, financial closure of the charge numbers and administrative closure of the paper work

Project management is a set of principles, methods, and techniques that people use to effectively plan and control project work. It establishes a sound basis for effective planning, scheduling, resourcing, decision-making, controlling, and re-planning. Project management principles and techniques help complete projects on schedule, within budget, and in full accordance with project specifications. At the same time, they help achieve the other goals of the organization, such as productivity, quality, and cost effectiveness. The objective of project management is to optimize project cost, time, and quality. (Larry Richman, 2002)

2.1.3 History of Project Management

Project management has been practiced for thousands of years since the Egyptian era, however, it has been about half a century ago that organizations start applying systematic project management tools and techniques to complex projects. Snyder and Kline (1987) noted that the modern project management era started in 1958 with the development of CPM/PERT. Morris (1987) argues that the origin of project management comes from the chemical industry just prior to World War II. Morris (1987) further notes that the project management is clearly defined as a separate discipline in the Atlas missile program, especially in the Polaris project.

Four distinctive periods prior to 1958, between 1958 and 1979, between 1980 and 1994, and 1995 to present have been identified to better capture the history of modern project management, and in these periods there is distinctive project management tools, techniques and science

2.1.3.1 Prior to 1958

The origin of the modern project management concept started between 1900s and 1950s. During this time, technology advancement reduced the project schedule. Telecommunication system increased the speed of communication. Automobiles allowed effective resource allocation and

mobility. The job specification was widely used and Henry Gantt invented Gantt chart. The job specification later became the basis of developing the Work Breakdown Structure (WBS).

Actual Representative Projects

- ***T.D. Juhah's Project Plan for Building Pacific Railroad:*** In T.D Judah's (1857) "A Practical Plan for Building the Pacific Railroad," engineers and clerks at the project office prepared a formal report upon arrivals of survey information from the field managers. Once the data has been updated and analyzed, the project office forwarded orders to resident engineers, and field managers initiated the project. The project office also dealt with relationship with investors, field survey, cost estimation, feasibility study, and others. Project office simply functioned as an administrative office.

- ***Hoover Dam (1931–1936):*** In 1928, the U.S congress passed the Boulder Canyon Act assigning $175 million to the Hoover Dam. The "Big Six" that consists of Utah Construction, Pacific Bridge, H.J. Kaiser, W.A MacDonald and Kahn, Morrison-Knudsen, and J.H. Shea formed a consortium to work as a general contractor. It was crucial for the companies to have a detail project planning, controlling, and coordinating plan because the project involved six independent companies. The construction site was located in the middle of the desert with no infrastructures. Boulder City was created to accommodate their workers to stay near the construction site.

  The project employed approximately 5,200 workers, and large amount of construction resources including concrete, structural steel components, steel pipe, and so on were required. The project was successfully completed under budget and ahead of schedule (David Moore, 1999). The Hoover dam project is still one of the highest gravity dams in the U.S., which generates more than four billion kilowatt-hours a year.

- ***Manhattan Project (1942–1945):*** The Manhattan project was the pioneer research and development project that designed and built the atomic bomb. The initial project was proposed in 1939 to defend possible threats from Germany. In 1941, the Office of Scientific Research and Development (ORSD) were established to coordinate government-sponsored projects, and the Manhattan project initiated in 1942. The OSRD coordinated universities and resources for the research and development of the atomic bomb. The project was successfully

tested in July of 1945, a month before the bomb was dropped on Hiroshima, Japan. The project involved 125,000 labors, and cost nearly $2 billion.

2.1.3.2 Between 1958-1979

There were significant technology advancement between 1958 and 1979. In 1959, Xerox introduced the first automatic plain-paper copier. In the 1960s, many industries were influenced by the development of silicon chips and minicomputers. In 1969, Bell Laboratories developed programming language UNIX and computer industry started to develop rapidly. NASA's successful Apollo project earmarked a historic event of the mankind. In 1971, Intel introduced 4004, a 4-bit microprocessor, which is a foundation of the evolution of Intel's 80386, 80486, and Pentium processors in the 1990s. While many dedicated scientists developed ARPANET, Ray Tomlinson in 1972 introduced the first e-mail software. In 1975, Bill Gates and Paul Allen founded Microsoft. Several project management software companies were founded during the 1970s including Artemis (1977), Scitor Corporation (1979), and Oracle (1977).

Between 1950 and 1979, several core project management tools including CPM/PERT, Material Requirement Planning (MRP) and others were introduced. CPM/PERT was calculated in large computer systems, and specialized programmers operated the CPM/PERT mainly for the government sector projects.

Actual Representative Projects

- ***Polaris project (1956–1961):*** The Polaris project refined the project management concepts as known today (Sapolsky 1972). The $11 billion Polaris project was undertaken by the U.S. government to deliver nuclear missiles carried by submarines, known as Fleet Ballistic Missile. The project was initiated by U.S. Navy in late 1956, and successfully launched its first Polaris missile in 1961. The Navy created a new unit called Special Project Office (SPO) to avoid giving the Polaris project to Bureau of Ordinance and Bureau of Aeronautics (Sapolsky 1972).

- ***Apollo project:*** In 1958, National Aeronautics and Space Administration (NASA) was created. Between 1969 and 1972, NASA successfully led six missions to explore the moon. In 1960, NASA set up the Apollo program office to provide following functions:

- Maintain and schedule Apollo missions using PERT.
- Procurement and contracting with suppliers such as GE.
- Develop management system to measure the performance.
- Set up a focal point of the Apollo program.

- ***ARPANET:*** The Internet project began its journey in 1962. It started with series of memos discussing the concept of "Galactic Network," by J.C. R. Licklider of MIT (Barry et al. 2000). The U.S. Department of Defense initially funded the project, and Advanced Research Projects Agency (ARPA) coordinated it. The ARPA's objective was to schedule and coordinate the activities of the heterogeneous set of contractors. (Hughes 1998). The ARPA started to develop its ARPANET, the origin of the Internet. The ARPA project was a research and development project that was initially developed by the ARPA then managed by several organizations.

2.1.3.3 Between 1980-1994

During the 1980s and early 1990s, the revolution of information technology and information system (IT/IS) sector shifted people from using mainframe computer to multitasking personal computer that had high efficiency in managing and controlling complex project schedules . In the mid 80s, the Internet served researchers and developers, and local area networks and Ethernet technology started to dominate network technology (Barry et al 2000).

During the 1950s through 1970s, most computer engineers were responsible for operating the project management systems because the mainframe systems were not easy to use. During the late 1970s and early 1980s, project management software for PC became widely available by a number of companies in the mid-1980s which made project management techniques more easily accessible.

Actual Project Cases

These projects illustrated the applications of hi technology and the project management tools and practices.

- **The English-France Channel project (1989- 1991):** The project was an international project that involved two (British and French) government agencies, several financial institutions, engineering construction companies, and other various organizations between the two countries. The project goal, cost, schedule, and other factors needed to be adjusted to conduct the project. The language, use of standard metrics, and other communication differences needed to be coordinated.

- **Space Shuttle Challenger project (1983-1986):** The disaster of the Space Shuttle Challenger instantly brought a lot of attention to the project management community. The incident brought more interests in risk and quality management, and group dynamics.
- **The XV Calgary Olympic Winter Games (1988):** The Calgary Winter Olympic games in 1988 applied project management to event management. Its successful adoption of the project management practices expanded to various event management practices.

2.1.3.4 1995 – Present

The Internet started to change virtually every business practices in the mid 1990s. It provided fast, interactive, and customized new medium that allowed people to browse, purchase, and track products and services online instantly. As a result, the Internet permits organizations to be more productive, efficient, and customer-oriented. Between 1995 and 2000, the project management community adopted internet technology to become more efficient in controlling and managing various aspects of projects. While the information technology revolutionized the traditional business practices, various industries started to adopt and to apply project management practices.

Actual Project Cases

- ***Year 2000 (Y2K) Project:*** The Year 2000 (Y2K) Problem known as the millennium bug referred to the problem that computers may not function correctly on January 1st, 2000 at 12 AM. It was a man-made problem that started back in the 1950s.

  The Y2K project integrated several aspects of project management. First, the Y2K project had a specific objective (to fix Y2K problems) and sharp deadline (on January 1st, 2000 at 12:00 AM). Second, the project was globally and independently conducted that virtually every organization using computers were at stake. Each organization focused on correcting Y2K problems within the organization, but the problem was interrelated due to the dependency of various computer systems via computer network. Third, there were various methodologies and tools to remedy the problem. Fourth, from the initiation to completion, detailed progressive reports were widely available. The Y2K project became the most documented projects in the project management history because virtually similar projects were conducted by millions of organization in the world.

Y2K problem boosted many organizations to adopt project management practices, tools, and techniques to conduct their own Y2K project. Many organizations set up the project office to control and comply with their stakeholders regarding Y2K issue. Furthermore, use of the Internet was common practice for Y2K projects which led to set up a virtual project office. In addition, it increased the awareness and importance of risk management practices to numerous organizations.

- ***Iridium Project:*** Motorola's $5 billion Iridium project aimed to provide global communication service virtually anywhere at any time. In November 1998, the Iridium network was established, and started to provide global network services. In March 2000, Iridium filed for bankruptcy terminating its services. The project was once viewed as a technological breakthrough; however, it ended up so quickly and mysteriously. The program office was established with full time project control managers, software engineers and analysts were also relocated. In addition, the project control managers utilized sophisticated project management software, Primavera Project Planner, to handle complex and inter-related project scheduling management. (Barboza, 2000).

Table 1: The Brief History of Project Management

	Technology	**Management Science**	**Project Management & Technology**	**Major Projects**	**Project Office**
Prior to – 1958	✓ Telegraph ✓ Telephone ✓ First computer ✓ Automobile ✓ Airplane ✓ First database	✓ Adam Smith ✓ Frederick W. Taylor ✓ Henry Fayor ✓ Henry Gantt ✓ A McGregor's XY theory	✓ Parametric Cost Estimating ✓ PERT/CPM ✓ Gantt Chart ✓ Monte Carlo Simulation ✓ Systematic Application	✓ Inter Continental railroads ✓ Hoover Dam ✓ Polaris ✓ Manhattan project ✓ Panama Canal	✓ Focal point ✓ "proximity" ✓ Traditional project office functions ✓ Navy Special Project Office (SPO)
1959 – 1979	✓ IBM 7090 ✓ Xerox copier ✓ UNIX ✓ Microsoft Founded	✓ ISO ✓ TQM ✓ Globalization ✓ Quality Management	✓ PMI ✓ Inventory Control ✓ MRP	✓ Apollo 11 ✓ ARPANET	✓ Project ✓ Supporting Office

1980 - 1994	✓ Personal Computer ✓ Wireless in building network ✓ First Internet browser (MOSAIC)	✓ Manufacturing resource planning ✓ Risk Management	✓ Matrix organization ✓ PM Software for PC	✓ Boeing 777 ✓ Space Shuttle Challenger ✓ The English-France Channel project	✓ Project Headquarter ✓ War Room
1995 - Current	✓ Internet	✓ Critical chain ✓ Enterprise Resource Planning	✓ PMBOK (PMI)	✓ Iridium ✓ Y2K project	✓ Virtual Project Office ✓ Web-base Project Office

Source:

2.1.4 Project Success, Success Criteria and Success Factors

The project management literature agrees that there are two components of project success, (Jugdev and Muller, 2005; Morris and Hough, 1987; Wateridge, 1998; Turner, 1999)

- ✓ **Project success factors**, elements of a project that can be influenced to increase the likelihood of success; these are independent variables that make success more likely
- ✓ **Project success criteria**, the measures by which we judge the successful outcome of a project; these are dependent variables which measure project success.

Project success criteria vary from project to project. What is acceptable in one project without impact on perceived success is abject failure in another project. People, organizations, or stakeholders also judge the success of projects differently depending on their personal objectives, and it can be the case that one person judges a given project a success, while another judges it a failure.

A successful project satisfies three factors: it complies with the functionality agreed to in advance, it is delivered on time and it is delivered within the agreed budget. When these three factors balance each other, we can speak of a successful project. Successful project management can then be defined as having achieved the project objectives of finalizing the project within time, within cost, at the desired performance/technology level, while utilizing the assigned resources effectively and efficiently and the project should be accepted by the customer (Kerzner, 2009, 3).

Project Success Criteria

According to Crawford (2005) project success is an important project management issue, it is one of the most frequently discussed topics and there is a lack of agreement concerning the criteria by which success is judged (Pinto and Slevin 1988; Freeman and Beale 1992; Shenhar, Levy, and Dvir 1997; Baccarini 1999).

A review of the literature further reveals that there is, in fact, a high level of agreement with the definition provided by Baker, Murphy, and Fisher (1988), that project success is a matter of perception and that a project will be most likely to be perceived to be an "overall success" if: …….the project meets the technical performance specifications and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people on the project team, and key users or clientele of the project effort.

There is also a general agreement that although schedule and budget performance alone are considered inadequate as measures of project success, they are still important components of the overall construct. Quality is intertwined with issues of technical performance, specifications, and achievement of functional objectives and it is achievement against these criteria that will be most subject to variation in perception by multiple project stakeholders.

Project Success Factors

According to the 1994 Standish CHAOS Report, there are top 10 factors found in successful projects. These factors are listed in Table below (Clancy, T. 1995).

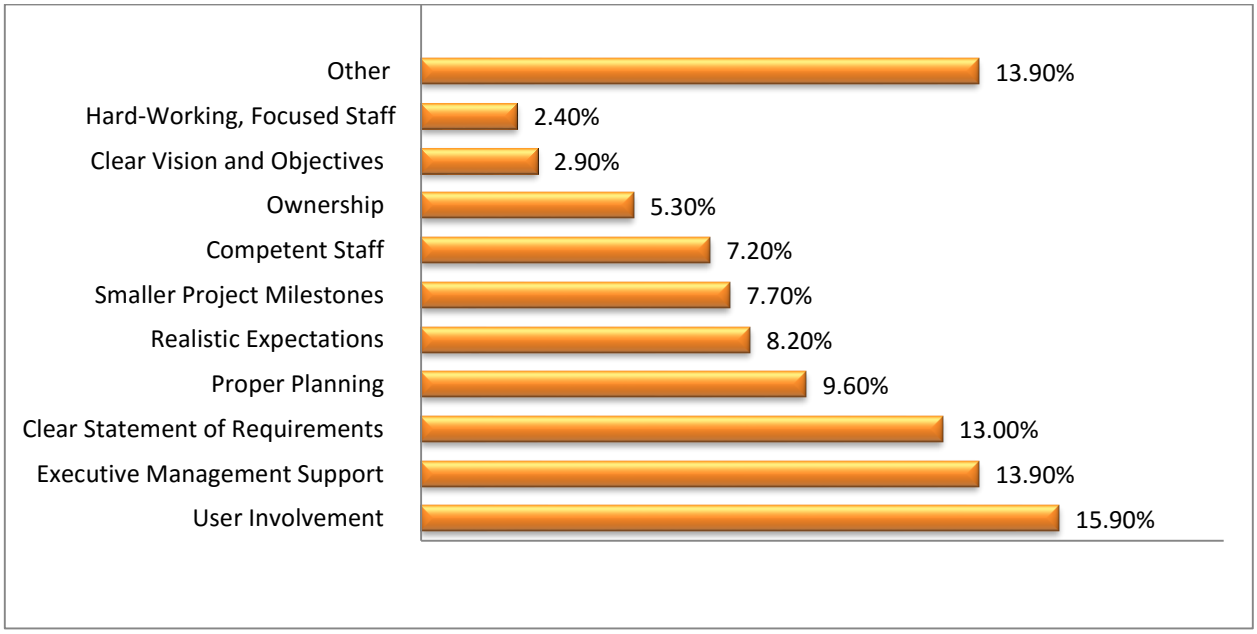

Figure 3: Project Success Factors

1. **User involvement:** the absence of user involvement is the major cause of project failure. Even when delivered on time and on budget, a project can fail if it does not meet users' needs.
2. **Executive management support:** this influences the process and progress of a project and lack of executive input can put a project at a severe disadvantage.
3. **Clear statement of requirements:** this refers to the base level requirements. By creating a minimal, obtainable base level of requirements and then developing those features, the effect of change will be reduced. As a result, an added benefit is that project managers are better prepared to articulate the needs and priorities of the next phase of the project.
4. **Proper planning:** this is one of the keys to a successful project. Creating a project plan is the first thing to do when undertaking any kind of project.

Murphy, Baker and Fisher (1974) used a sample of 650 completed aerospace, constructions, and other projects with data provided primarily by project managers on the factors contributing to project success. Theirs have been the most cited, used, extensive and authoritative research in the area of project success factors. They found ten factors that were found to be strongly linearly related both to perceived success and perceived failure of projects, while twenty-three project management characteristics were identified as being necessary but not sufficient conditions for perceived success Baker, Murphy, and Fisher (1988).

Pinto and Slevin (1987, 1988) and Morris and Hough (1986, 1987) also did an important work on project success factors in the 1980s. While Morris and Hough (1986, 1987) drew primarily on literature and case study analysis of major projects, Pinto and Slevin (1987, 1988) based their findings on the opinions of a usable sample of 418 PMI members responding to questions asking them to rate the relevance to project implementation success of ten critical success factors and four additional external factors (Slevin & Pinto 1986).

Table 2: Lists of critical success factors developed by Belassi & Tukel (1996)

Sayles and Chandler (1971)	Martin (1976)	Baker, Murphy and Fisher (1983)	Cleland and King (1983)	Lock (1984)	Morris and Hough (1987)	Pinto and Slevin (1989)
✓ Project manager's competence ✓ Scheduling ✓ Control systems and responsibilities ✓ Monitoring and feedback ✓ Continuing involvement in the project	✓ Define goals ✓ Select project organizational philosophy ✓ General management support ✓ Organize and delegate authority ✓ Select project team ✓ Allocate sufficient resources ✓ Provide for control and information mechanisms ✓ Require planning and review	✓ Clear goals ✓ Goal commitment of project team ✓ On-site project manager ✓ Adequate funding to completion ✓ Adequate project team capability ✓ Accurate initial cost estimates ✓ Minimum start-up difficulties ✓ Planning and control techniques ✓ Task (vs. social orientation) ✓ Absence of bureaucracy	✓ Project summary ✓ Operational concept ✓ Top management support ✓ Financial Support ✓ Logistic Requirements ✓ Facility support ✓ Market intelligence (who is the client) ✓ Project schedule ✓ Executive development and training ✓ Manpower and Organization ✓ Acquisition ✓ Information and communication channels ✓ Project review	✓ Make project commitments known ✓ Project authority from the top ✓ Appoint competent project manager ✓ Set up communications and procedures ✓ Set up control mechanisms (schedules, etc.) ✓ Progress meetings	✓ Project objectives ✓ Technical uncertainty innovation ✓ Politics ✓ Community involvement ✓ Schedule duration urgency ✓ Financial contract legal problems ✓ Implement problems	✓ Top management support ✓ Client Consultation ✓ Personnel recruitment ✓ Technical tasks ✓ Client acceptance ✓ Monitoring and feedback ✓ Communication ✓ Trouble-shooting ✓ Characteristics of the project team leader ✓ Power and politics ✓ Environment events ✓ Urgency

Therefore, one can conclude that there are umpteen numbers of factors that may have a bearing on project success. They may differ from one project to another. Following section describes the role of a project manager in achieving project success.

2.1.5 Project Failure

The term project failure is defined by different writers in different ways without shifting the basic meaning. Some authors have the opinion that a project fails when it does not achieve successful implementation and others take it further and include the user satisfaction and the benefits for the business in their assessment.

According to Jones (1996-1) the term "failure" refers to projects that are cancelled without completion due to cost or schedule overruns or that run later than planned by more than 25 percent. A failure is also defined as any software project with severe cost or schedule overruns, quality problems or that suffers outright cancellation. Flowers (1996) define an information system as a failure if any of these following situations occurs: the first one is when the system as a whole does not operate as expected and its overall performance is suboptimal. Secondly if, on implementation, it does not perform as originally intended or if it is so user-hostile that it is rejected by users underutilized. Thirdly, if the cost of the development exceeds any benefits the system may bring throughout its useful life. And lastly due to problems with the complexity of the system, or the management of the project, the information system development is abandoned before it is completed. As per, Smith (2001) a failed project is a project which does not make the journey from conception through to successful implementation.

Project Failure Factors

As indicated in the website named www.it-cortex.com, in 1998, the French computer manufacturer and systems integrator, BULL, requested an independent research company, Spikes Cavell to conduct a survey in the UK to identify the major causes of IT project failure in the finance sector. The survey reveals that the major causes of project failure during the lifecycle of the project are a breakdown in communications (57%), which is resulted by Bad communication between relevant parties, a lack of planning of schedule, resource and activities (39%) and poor quality control (35%). In the contrary, even if they have some contributions issues related with suppliers are the list factors for project failure. (http://www.it-cortex.com/Stat_Failure_Cause.htm, accessed December, 20, 2013)

Figure 4: Project Failure Factors

2.1.6 Project Management Methodology

Wateridge (1995) suggests that in choosing a project management methodology, the project sponsor or project manager should identify the relevant success criteria, from them determine appropriate success factors to increase the chance of achieving those success criteria, and then select a project management methodology that delivers those success factors. Crawford et al. (2005) have developed a categorization system for projects which they offer as helping to identify appropriate methodologies for projects, but they offer no guidance on whether different success criteria will be relevant for different types of projects, and hence different success factors, and whether different projects will perform differently against those different success criteria. In addition, project sponsors, when selecting project managers to manage their projects, want to know that the manager will focus on the relevant success criteria of the project, and will be skilled in implementing the appropriate success factors. Thus the sponsor wants a project manager not just with appropriate competencies, (Turner and Muller, 2006; Mu¨ ller and Turner, 2007), but also with appropriate focus for their work.

2.2 Empirical data on Project Success and Failure

The Standish Group Report (1995) indicates that in the United States, more than $250 billion is spend each year on IT application development of approximately 175,000 projects. The average cost of a development project for a large company is $2,322,000; for a medium company, it is $1,331,000; and for a small company, it is $434,000. The report indicates that a great many of these projects will fail. Software development projects are in turmoil. The Standish Group research shows a staggering 31.1% of projects will be cancelled before they ever get completed. Further results indicate 52.7% of projects will cost 189% of their original estimates. The lost opportunity costs are not measurable, but could easily be in the trillions of dollars.

Based on the research made by The Standish Group in 1995 American companies and government agencies will spend $81 billion for canceled software projects. These same organizations will pay an additional $59 billion for software projects that will be completed, but will exceed their original time estimates.

On the success side, the average is only 16.2% for software projects that are completed on-time and on-budget. In the larger companies, the news is even worse: only 9% of their projects come in on the scheduled time and planed budget. And, even when these projects are completed, many are no more than a mere shadow of their original specification requirements. Projects completed by the largest American companies have only approximately 42% of the originally-proposed features and functions. Smaller companies do much better. A total of 78.4% of their software projects will get deployed with at least 74.2% of their original features and functions.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

Research design and methodology encompasses the methodology and procedure employed to conduct the research. Thus, this chapter presents the research design, target population, sampling techniques and procedure, sample size determination, sample size proportion, types of data, tools of data collection, sources of data, method and procedures of data collection and methods of data processing and analysis.

3.1 Research Design

Since the research involves on the concepts related with project, project management, project success, project failure and other quality issues the research is designed to be descriptive.

3.2 Population and Sampling Techniques

As mention in the scope of the study the researcher spotlights its study in all commercial projects. Therefore the sample of the study is taken only from commercial projects. Since there are different group in the projects with technical perspective like software projects and network projects the researcher applied proportionate stratified stage sampling technique in order to incorporate different projects and for not excluding potential project on the representative sample. In doing these first the researcher divide the total population (projects) in to different strata then because all the list of projects is available systematic sampling technique is applied to select the sample projects which represent those strata and the total population (projects).

Related with the sample size the researcher uses the sample size selection chart which is developed by Isaac and Michael (1981) as indicated in the appendices. Therefore since the total projects of the company is around one hundred twenty five (125), the researcher uses ninety six(96) projects which covers 76.8% of the total projects at 95% confidence level, but the percentage share is different from strata to strata because the number of projects is significantly differs within those strata. Therefore the number of samples taken from those strata is dependent on the percentage share taken by those strata from the total number of projects.

3.3 Types of Data and Tools/Instruments of Data Collection

To reach on a sound finding, the student researcher gathers primary and secondary data from the project management office of the organization and from finance department regarding information which are significantly related with the study. In order to gather the primary data, self administered questionnaire and focus group discussion was used and in order to get secondary data document review is applied.

3.4 Procedures of Data Collection

After dividing the whole projects into different strata, the primary data from those samples (samples from different strata) is collected using self administered questionnaire and in order to get secondary data the researcher investigates finance related reports, project agreements, acceptance documents, and other project related document.

3.5 Methods of Data Analysis

The researcher after collecting adequate and enough data tabulation and graphs methods are used for analysis propose and in order to generate these categorized data statistical package for social science (SPSS) IBM version 20 is used.

CHAPTER FOUR

RESULTS AND DISCUSSION

Demographic characteristics of the respondents, analyses and interpretation based on the data collected from the sample respondents are presented in this chapter. Moreover, summarized results of the demographic profile of respondents and the response towards the items included in the questionnaire as well as descriptive statistics are presented under this section.

A self administered questionnaire was employed and distributed to project managers who are in the Agency. A total of 106 copies of the questionnaire, which are 10% more than the required 96, were distributed to the project managers and respondents were given 5 days to answer the questionnaires. In all, a total of 94 useable questionnaires were collected back from the respondents, representing a response rate of 88.68%. But since 96 questionnaires are the required sample by the applied sample size selection standard, the response rate is 97.92%.

4.1 Results of the Study

The respondents in the study were found to be male (more than 93%), young adult dominated with a little bit high degree of variability in the distribution of their age. More than 80% of the sampled project managers of the Agency were found to be in the age bracket of 27-30 years, and the age group of 31-35 accounted for 19%.

Table 3: Descriptive Statistics of Demographic, Educational Level and age structure

		Frequency	Percent	Valid Percent
Sex	Female	6	6.4	6.4
	Male	88	93.6	93.6
Educational Level	College/University (First Degree)	86	91.5	91.5
	Post Graduate (Masters Degree)	8	8.5	8.5
Age	25-29	68	72.3	72.3
	30-35	26	27.7	27.7
	36 and Above	0	0	0

All of the participants in the survey are literate people who have already achieved different levels of education. The Agency's project managers are well-educated who are believed to be responsible for and have a responsibility to know about and practice all issues related to responsibility they are given.

As indicated in the table below, the mean value of years in the organization and years in the job is 4.702 and 2.744 respectively. More than 55% of respondents are worked in the organization for more than 5 years and total sample respondents works for more than 4 years. Similarly 40.4 respondents are work in their job for around 2 years and the other 44.7% and 14.9% are those who stayed in the job for around 3 and 4 years respectively.

Table 4: Descriptive Statistics of years in the organization and on the job

		Frequency	Percent	Valid Percent	Mean	Skewness	Kurtosis
Years in the Organization	4.00	42	44.7	44.7	4.7021	0.511	-0.906
	5.00	38	40.4	40.4			
	6.00	14	14.9	14.9			
Years on the Job	2.00	38	40.4	40.4	2.7447	0.403	-0.901
	3.00	42	44.7	44.7			
	4.00	14	14.9	14.9			

Majority of the respondents 52% and 47.9% respectively says success variables are somewhat important. but on the contrary 16 % says executive management support is very important and 17% says hard working, focused staff is slightly important, so these shows the inclination of focus project managers to hard working, focused staff rather than executive management support.

Table 5: SUCCESS factors that have played an important role in the success of projects

No.	SUCCESS factors that have played an important role in the success of project	%						
		VI	SOI	SLI	N	SLU	SOU	VU
1	User Involvement	39.4	33.0	27.7	-	-	-	-
2	Executive management support	16.0	52.0	31.9	-	-	-	-
3	Clear statement of Requirements	73.4	25.5	1.1	-	-	-	-
4	Proper planning	36.2	35.1	28.7	-	-	-	-
5	Realistic Expectation	12.8	35.1	52.1	-	-	-	-
6	Smaller Project Milestones	14.9	40.4	43.6	1.1	-	-	-
7	Competent staff	50.0	28.7	21.3	-	-	-	-
8	Ownership	7.40	36.2	34.0	22.3	-	-	-
9	Clear Vision and objective	10.6	38.3	51.1	-	-	-	-
10	Hard working, Focused Staff	35.1	47.9	17.0	-	-	-	-
VI = Very Important **SOI** = Somewhat Important **SLI** = Slightly Important		**N** = Neither Important nor Unimportant			**VU**= Very Unimportant **SOU**= Somewhat Unimportant **SLU**= Slightly Unimportant			

As per the project managers' attitude ownership feeling is not as such success factor comparing with the other variables.

All the respondents agreed on the importance of the variables for the failure of the projects with some slight weight difference. But on variables of lack of planning of scheduling, resource and activities (60.6%), milestones not being met (46.8%), inadequate co-ordination of resources (55.3%), mismanagement of progress (46.8%), and overall poor management (56.4%) majority of the respondents says they are somewhat important. Similar on these variables those respondents who say they are slightly important comprise 18.1%, 24.5%, 31.9%, 21.3% and 19.1% respectively.

Table 6: FAILURE factors that contribute an important role in the failure of projects

No.	FAILURE factors that contribute an important role in the failure of projects	%						
		VI	SOI	SLI	N	SLU	SOU	VU
1	Bad communication between relevant parties	27.7	33.0	39.4	-	-	-	-
2	Lack of planning of scheduling, resource and activities	21.3	60.6	18.1	-	-	-	-
3	No quality control	74.5	25.7	-	-	-	-	-
4	Milestones not being met	28.7	46.8	24.5	-	-	-	-
5	Inadequate coordination of resources	12.8	55.3	31.9	-	-	-	-
6	Costs getting out of hand	-	55.3	44.7	-	-	-	-
7	Mismanagement of progress	31.9	46.8	21.3	-	-	-	-
8	Overall poor management	24.5	56.4	19.1	-	-	-	-
9	Supplier under resourced	-	41.5	58.5	-	-	-	-
10	Insufficient measurable outputs	-	54.3	45.7	-	-	-	-
11	Supplier people not consistent	-	37.2	62.8	-	-	-	-
VI= Very Important **SOI=** Somewhat Important **SLI=** Slightly Important		**N=** Neither Important nor Unimportant			**VU=** Very Unimportant **SOU=** Somewhat Unimportant **SLU=** Slightly Unimportant			

Regarding communication and coordination there is poor communication with customers and stakeholders. Mainly most of the communication is done orally, and problems are emanated from this kind of informal communication.

Related with planning there are limitations on planning techniques, and there are no well clear and accepted development approaches, methods, tools and techniques, and generally the planning process is not well organized and some activities are missed from the planning process.

The other problem related with the management aspect is the problem of attaching maintenance with projects, everything is dependent on the project manager, and there is no standardized document coding, lack of change management facility and responsibilities, and change resistance nature of individuals.

Risk management strategy is not developed and incorporated in the plan, but in some projects identifying risk is done by copying from the previous one.

The common risks which are identified by the participants are scope risk (additional tasks are added in the middle of the project and frequent changes on the customers requirement), planning risk (which happens because of knowledge gap on the planning), human resources risk (because there is high staff turnover), procurement delay (especially foreign procurement) and mainly the introduction of new technologies before having enough knowledge & testing it on in-house projects.

There are no quality standards and there is technical limitation on quality assurance and control techniques. Almost all projects are not finalized within the budgeted time and there is an attitude of disregarding time as far as results are attained. Most of the customers have problem/gap on technical capability, knowledge and skill. In addition to that since most projects are initiated by the agency there is less users/customer participation, lack of willingness and resistance to the project. Yet standards such as ISO 9000 are partly referred, change, risk and quality are considered only at the documents level, all of the aspects related with quality, outcome, quality and time are not respected at all.

4.2 Discussion of the Result

4.2.1 Reliability Test and Correlation

Reliability Test of Items on Success Factors

After the researcher has analyzed those items in the factor analysis, the outputs are presented in Table 7 below. The values in the column labeled Corrected Item-total Correction were found to be greater than 0.3. This indicates good internal consistency and identifies item 3 and 8 as a potential problem because its value was found to be a bit higher than the overall Cronbach's α. Here, the values in the column labeled *Cronbach's alpha if Item is Deleted* also indicate that none of the

items would increase the reliability if they were deleted because almost all values in this column are less than the overall reliability of .867.

Table 7: Item-Total Statistics

Item-Total Statistics					
	Scale Mean if Item Deleted	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Squared Multiple Correlation**	**Cronbach's Alpha if Item Deleted**
1	53.29	18.551	.778	.684	.836
2	53.56	20.227	.655	.502	.848
3	52.68	22.865	.350	.209	.869
4	53.33	18.718	.760	.663	.838
5	53.80	20.464	.580	.426	.854
6	53.71	20.723	.511	.375	.859
7	53.12	18.965	.730	.602	.841
8	54.12	20.986	.349	.239	.877
9	53.81	20.909	.534	.358	.857
10	53.22	20.412	.593	.464	.853
1= User Involvement 2= Management Support 3= Clear Requirement 4= Proper Planning		5= Realistic Expectation 6= Smaller Millstone 7= Competent Staff		8= Ownership 9= Clear Vision Objective 10= Hard working and focused Staff	

The last column presents the value that Cronbach's α would be improved if that particular item was deleted from the scale. One can deduce that the removal of any item except item 3 and 8 would result in a lower Cronbach's α. Therefore, almost all items are retained since such efforts will not increase the reliability of the items. Thus, it is not advisable to remove those items in the questionnaire. However, the removal of item 3 and 8 may lead to a small improvement in Cronbach's α – because the value of this item in this column is less than the overall reliability of .867. These values lead us to deduce that even if one gets a small improvement in the value of Cronbach's α by removing item 3 and 8, it will not be advisable to discard the item because of the moderate and positive correlation with other variables. Generally, almost all items in the questionnaire have high reliabilities.

Table 8 below shows data related to reliability or internal consistency between those subscales designed to evaluate the respondents' personal know how about of success factors of projects. As one can see in Table 8 for the ten (10) subscales indicated below and those subscales in the questionnaire which were designed to measure the reliability of those scales on the personal know how about success factors of projects, the overall value of Cronbach's α= .867. This value indicates

a high level of internal consistency between the subscales (factors). Thus, all those subscales had high reliabilities.

Table 8: Reliability Statistics

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.867	.866	10

Reliability Test of Items on Failure Factors

After the researcher has analyzed those items in the factor analysis, the outputs are presented in Table 9 below. The values in the column labeled Corrected Item-total Correction were found to be greater than 0.3. This indicates good internal consistency and identifies item 10 as a potential problem because its value was found to be a bit higher than the overall Cronbach's α. Here, the values in the column labeled *Cronbach's alpha if Item is Deleted* also indicate that none of the items would increase the reliability if they were deleted because almost all values in this column are less than the overall reliability of 0.817.

Table 9: Item-Total Statistics

Item-Total Statistics					
	Scale Mean if Item Deleted	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Squared Multiple Correlation**	**Cronbach's Alpha if Item Deleted**
1	58.67	12.266	.559	.411	.795
2	58.52	13.091	.578	.738	.793
3	57.81	14.522	.421	.240	.808
4	58.51	12.855	.520	.620	.799
5	58.74	13.246	.525	.664	.798
6	59.00	13.806	.556	.460	.797
7	58.45	12.895	.518	.599	.799
8	58.50	12.532	.672	.727	.782
9	59.14	14.658	.321	.844	.815
10	59.01	14.828	.270	.132	.819
11	59.18	14.537	.364	.849	.812

1= Bad communication	**5**= Inadequate coordination	**9**= Supplier Under resource
2= Lack of Planning	**6**= Costs Getting out of Hand	**10**= Insufficient Measurable output
3= No quality control	**7**= Mismanagement Progress	**11**= Supplier Not Consistent
4= Millstone Not Met	**8**= Poor Mgt	

The last column presents the value that Cronbach's α would be improved if that particular item was deleted from the scale. One can deduce that the removal of any item except item 10 would result in a lower Cronbach's α. Therefore, almost all items are retained since such efforts will not increase the reliability of the items. Thus, it is not advisable to remove those items in the questionnaire. However, the removal of item 10 may lead to a small improvement in Cronbach's α – because the value of this item in this column is less than the overall reliability of .817. These values lead us to deduce that even if one gets a small improvement in the value of Cronbach's α by removing item 10, it will not be advisable to discard the item because of the moderate and positive correlation with other variables. Generally, almost all items in the questionnaire have high reliabilities.

Table 10 below shows data related to reliability or internal consistency between those subscales designed to evaluate the respondents' personal know how about of failure factors of projects. As one can see in Table 10 for the eleven (11) subscales indicated below and those subscales in the questionnaire which were designed to measure the reliability of those scales on the personal know how about failure factors of projects, the overall value of Cronbach's α= .817. This value indicates a high level of internal consistency between the subscales (factors). Thus, all those subscales had high reliabilities.

Table 10: Reliability Statistics

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.817	.814	11

4.2.2 General Characteristics of the Respondents

The respondents in the study were found to be male, young adult dominated with a little bit high degree of variability in the distribution of their age. The findings of the study presented in Table 3 revealed that more than 93% of respondents were found to be males, while the females only accounted for 6.4% of the study subjects. More than 80% of the sampled project managers of the Agency were found to be in the age bracket of 27-30 years, and the age group of 31-35 accounted for 19%. The 94 sampled respondents of the study were found to have a mean age of 29.27 years and a median age of 28 years. For the age variable, the standard deviation value shows that its average deviation (dispersion) from the mean was about 2.131 years. In the study, it was found that the subjects had a minimum age 27 and the maximum of 35 years. Therefore, the Company's

project managers are significantly male adults, aged between 27 and 35, and it shows some homogeneity.

All of the participants in the survey are literate people who have already achieved different levels of education. Out of the total respondents 86(91.5%) of them graduated from a university or college and already earned undergraduate degrees, while the remaining 8(8.5%) received post- graduate degrees. Based on these findings of the study, one can deduce that the Company's project managers are well-educated who are believed to be responsible for and have a responsibility to know about and practice all issues related to responsibility they are given.

As indicated in the table-4 above the mean value of years in the organization and years in the job is 4.702 and 2.744 respectively. As indicated in the table 4 above the Skewness statistics about years in the organization is 0.511 and it is between 0.5 and 1, so the distribution is moderately skewed but the Skewness statistics about years in the job is 0.403 and it is between -0.5 and 0.5, so the distribution is approximately symmetric. Since both Skewness statistics are positive the data are positively or right skewed. When we see the Kurtosis values of both variables it is -.906 and -.901 so it means that the distribution is flatter than a normal distribution with a wider peak and the probability for extreme values is less than for a normal distribution, and the values are wider spread around the mean. More over from the total respondents around 44.7 are stayed in the organization for around 4 years and the other 40.4% and 14.9% are those who stayed in the organization for around 5 and 6 years respectively. From these one can deduct that more than 55% of respondents are worked in the organization for more than 5 years and total sample respondents works for more than 4 years. Similarly when we see the years those respondents work in their job is around 40.4 are works for around 2 years and the other 44.7% and 14.9% are those who stayed in the job for around 3 and 4 years respectively. From these one can deduct that more than 59% or respondents are worked in their job for more than 3 years and total sample respondents works for more than 2 years.

4.2.3 Success and Failure Factors

As we can see the response of the participants about success factors that have played an important role in the success of projects even if all responses about variables included in the questionnaire are skewed/ inclined to the positive side, there is moderate variance in the percentage shares. The table above shows that in the two variables (user involvement and proper planning) out of the ten there is somehow equal distribution between slightly important to very important. This shows that even if the respondents are in the same page regarding their importance, the data indicated the

degree of importance is slightly differs. On the other two variables, executive management support and hard working, focused staff, majority of the respondents 52% and 47.9% respectively says the variables are somewhat important. but on the contrary 16 % says executive management support is very important and 17% says hard working, focused staff is slightly important, so these shows the inclination of focus project managers to hard working, focused staff rather than executive management support. Related with realistic expectation, smaller project milestones and clear vision and objective variables majority of the respondents' states they are slightly important respectively 52.1%, 43.6% and 51.1%. In relation with ownership variable 22.3% says neither important nor unimportant and those who says it is somewhat and slightly important cumulatively is about 70.2 %. This shows that as per the project managers' attitude ownership feeling is not as such success factor comparing with the other variables. Regarding clear statement of requirements majority (73.4%) says it is very important.

As shown in the table-6 above, all the respondents agreed on the importance of the variables for the failure of the projects with some slight weight difference. But on variables of lack of planning of scheduling, resource and activities (60.6%), milestones not being met (46.8%), inadequate co-ordination of resources (55.3%), mismanagement of progress (46.8%), and overall poor management (56.4%) majority of the respondents says they are somewhat important. Similar on these variables those respondents who say they are slightly important comprise 18.1%, 24.5%, 31.9%, 21.3% and 19.1% respectively. These shows that even if the respondents are on the same page on their importance, they didn't think they are very important as such.

On the contrary all the respondents says variables like costs getting out of hand, supplier under resourced, insufficient measurable outputs and supplier people not consistent are not very important factors for project failure. in relation with supplier people not consistent and supplier under resourced majority of the respondents, 62.8% and 58.5% respectively, says it is slightly important and in relation with costs getting out of hand and insufficient measurable outputs majority of the respondents, 55.3% and 54.3% respectively, says it is somewhat important. Therefore, this shows that the project managers' attitude and the agency perspective towards these variables are as such not strong. Regarding no quality control majority (74.5%) says it is very important and the response in relation with bad communication between relevant parties is somehow equally distributed with a bit inclination to slightly important.

4.2.4 Focus Group Discussion

On the discussion the main ideas are involved on major categories like communication and coordination, planning and management, quality, time, scope, cost and budget, procurement and supplier, and user (customer). Regarding communication and coordination the participants claims that there is poor communication with customers and stakeholders. Mainly most of the communication is done orally, and they witnessed some problems emanated from this kind of informal communication.

The other major point is related with planning and management. Related with planning there are limitations on planning techniques, and there are no well clear and accepted development approaches, methods, tools and techniques, and generally the planning process is not well organized and some activities are missed from the planning process. These things come to the picture because plans are always done just for the sake of formality and they are not used for controlling purpose. Therefore there is a very poor quality of plan, poor project initiation and in almost all projects the agency involves directly without any feasibility study. The other thing related with planning is the ignorance of inputs purchasing time, which is the reason for most of the projects dalliance. With respect to the management issue there is lack of knowledge and experience about standardized project management, including change and risk management tools, techniques and methodology. The other problem related with the management aspect is the problem of attaching maintenance with projects, everything is dependent on the project manager, and there is no standardized document coding, lack of change management facility and responsibilities, and change resistance nature of individuals.

Regarding risk management even if there is understanding about risk and risk management it is completely forgotten when it comes to practice. Risk management strategy is not developed and incorporated in the plan, but in some projects identifying risk is done by copying from the previous one which is good but can lead to false conclusion, may not incorporate current situations and cannot be all inclusive. Rather there is dominant attitude of being more reactive to risks rather than being proactive and project managers and top management are majorly deals with those risks that already happened. The common risks which are identified by the participants are scope risk (additional tasks are added in the middle of the project and frequent changes on the customers requirement), planning risk (which happens because of knowledge gap on the planning), human resources risk (because there is high staff turnover), procurement delay (especially foreign

procurement) and mainly the introduction of new technologies before having enough knowledge & testing it on in-house projects.

In relation with human resource management there is unstable working environment, high Staff turnover, roles and responsibilities not clearly/well defined, and high level of mobility from one project to another. Project managers are technical individuals and making them managers may force the agency to lose competent technical personnel and on the other hand project managers are expected to deal with some technical issues and it makes the project manager not to get enough time to carry out the tough management activities.

The other major issue in project management which is missed by the agency is related with project scope, time, quality and cost or budgeting. Related with quality, there are no quality standards and there is technical limitation on quality assurance and control techniques. In majority of the projects quality had not been planned and the focus is on the completion of the given project not on its quality. In some projects even if quality planning and quality control are not addressed separately, they have one project plan which includes both issues. Generally one can say that formal quality planning, quality assurance and quality control mechanisms are not incorporated. Regarding the project scope, time, and cost or budgeting there is big problem with time estimation and there is blind budget cut. Almost all projects are not finalized within the budgeted time and there is an attitude of disregarding time as far as results are attained. Since there is knowledge and technical limitation on cost estimation and budget planning initial plans are not well detailed, for that reason additional costs emerge every time within the lifetime of the project and there are projects which are delayed around for 3(three) to 4(four) years and the dalliance of more than a year is becoming common on all projects. As per the participants the project managers major focus is on outcome only, so quality, budget, time and even outcome(since they are interrelated) are less managed in most of the projects, so majorly time will be more than expected.

The other main problem is on the part of user/customer. Most of the customers have problem/gap on technical capability, knowledge and skill. In addition to that since most projects are initiated by the agency there is less users/customer participation, lack of willingness and resistance to the project. Because of these and other problems and limitations the customers may commission the project just for the sake of commissioning and in some cases only the management is interested on the products but not the final users. So since the final user is not interested in the project or since they didn't believe the project will solve their difficulty there are problems in the requirement gathering which are inputs for requirement analysis document (RAD). The other issue related with

requirement analysis document (RAD) is in its preparation mostly new engineers are appointed from the agency side. Since these new engineers are not experienced in requirement gathering it leads to the misunderstanding of customer requirements and because of this requirements are not collected in detail and there will be clarity problems on the requirements and it will not be all inclusive. The other major issues are the absence of domain experts on the agency side, the absence of customer counterpart/consultant, and changes in the initial requirement because of structural and process change.

The other issues raised by the participants are the absence of strong competitors makes the agency reluctance to deliver the best, poor culture in adopting industry standards, methodology, tools and techniques, and the absence of well defined acceptance criteria.

Even if almost all the projects are challenged, network infrastructure projects are doing better because most of the inputs are external supplier dependent, and with respect to project success criteria no project is successfully delivered. Yet standards such as ISO 9000 are partly referred, change, risk and quality are considered only at the documents level, all of the aspects related with quality, outcome, quality and time are not respected at all.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Based on the results obtained from the study, summary of major findings and conclusions as well as recommendations to the study in line with the objective of the study are presented in this chapter.

5.1 Summary of Major Findings

- Regarding success factors that have played an important role in the success of projects and failure factors that contribute an important role in the failure of projects the project managers have good understanding with some deficiencies, specifically, the project managers' attitude towards of the effect of the felling of ownership towards the project on the project success factor is somehow deviate from the expected.
- Concerning communication and coordination there is poor communication with customers and stakeholders, and mainly most of the communication is done orally.
- Related with planning there are limitations on planning techniques, and there are no well clear and accepted development approaches, methods, tools and techniques, and generally the planning process is not well organized. Mostly, plans are done just for the sake of formality and they are not used for controlling purpose. There is a very poor quality of plan, poor project initiation and in almost all projects the agency involves directly without any feasibility study. Another issue related with planning is input materials/services purchasing time is ignored in the plan of majority of the projects and because of this most of the projects are delayed.
- Even if the Agency is trying to adopt some standard project management methodologies, tools and techniques, (like PRINCE2, PMBOOK, a combination of two or more and in house tools and techniques) there is lack of knowledge and experience about standardized project management, including change and risk management tools, techniques and methodology. The other problem related with the management aspect is the problem of attaching maintenance with projects, and there is no standardized document coding.
- Concerning risk management even if there is understanding about risk and risk management it is completely forgotten when it comes to practice. Risk management strategy is not developed and incorporated in the plan, but in some projects identifying risk is done by copying from the previous one which is good but can lead to false conclusion, may not incorporate current situations and cannot be all inclusive. There is dominant attitude of being

more reactive to risks rather than being proactive and project managers and top management are majorly deals with those risks that already happened. The common risks are scope risk, planning risk, human resources risk because there is high staff turnover, procurement delay and mainly the introduction of new technologies before having enough knowledge & testing it on in-house projects.

- In relation with human resource management roles and responsibilities are not clearly/well defined, and high level of mobility from one project to another is observed. Moreover project managers are technical individuals and making them managers may force the agency to lose competent technical personnel and on the other hand project managers are expected to deal with some technical issues and it makes the project manager not to get enough time to carry out the tough management activities.
- Pertaining to project scope, time, quality and cost or budgeting they are not professionally estimated, are not given due emphasis and in some projects there is blind budget cut. Since there is limitation of knowledge and technical on cost estimation and budget planning initial plans are not well detailed. For that reason additional costs emerge every time within the lifetime of the project and there are projects which are delayed around for 3(three) to 4(four) years and the dalliance of more than a year is becoming common on all projects. Related with quality, there are no quality standards and there is technical limitation on quality assurance and control techniques. In majority of the projects quality had not been planned and the focus is on the completion of the given project not on its quality. In some projects even if quality planning and quality control are not addressed separately, they have one project plan which includes both issues and standards such as ISO 9000 are to a certain extent referred. Generally formal quality planning, quality assurance and quality control mechanisms are not incorporated and project managers major focus is on outcome only, so quality, budget, time and even outcome(since they are interrelated) are less managed in most of the projects.
- The other main problem is on the part of user/customer. Most of the customers have limitations on technical capability, knowledge and skill. In addition to that since most projects are initiated by the agency there is less users/customer participation, lack of willingness and resistance to the project. Given that the final user is not interested in the project or since they didn't believe the project will solve their difficulty there are problems in the requirement gathering which are inputs for requirement analysis document (RAD). The other issue related with requirement analysis document (RAD) is in its preparation mostly new engineers are appointed from the agency side. Because these new engineers are not experienced in

requirement gathering it leads to the misunderstanding of customer requirements and for the reason that requirements are not collected in detail and there are clarity problems on the requirements and it is not all inclusive.

- The absences of domain experts on the agency side, well defined acceptance criteria and customer counterpart/consultant on the customer side, poor culture in adopting industry standards, and changes in the initial requirement because of structural and process changes are the other major problems.
- Even if almost all the projects are challenged, network infrastructure projects are doing better because most of the inputs are external supplier dependent, and with respect to project success criteria no project is successfully delivered.

5.2 Conclusions

From the above major findings the researcher concludes that;

- The major and critical failure factors for the Agency projects are
    - Poor communication and coordination with customers and stakeholders, insufficient requirement gathering and lack of user involvement.
    - Limitations on quality planning, quality control and quality assurance tools and techniques.
    - Limitations on planning of schedule, lack of practical application of planning tools and controlling techniques. Because of these planning problems, millstones are not met and progresses are not managed properly.
    - Limitations on risk and human resource management.
    - The absences of domain experts, a person who have special knowledge or skills in a particular area, as well as well defined project acceptance criterion which is defined before the project is started.
    - Lack of the felling of ownership towards the projects
- The major and critical success factors for the Agency projects are hard working and competent staff, and top management support.
- Even if the Agency is trying to adopt some standard project management methodologies, tools and techniques, (like PRINCE2, PMBOK, a combination of two or more and in house tools and techniques) there is lack of knowledge and experience.

- Most of the customers have limitations on technical capability, knowledge and skill. In addition to that since most projects are initiated by the agency there is less users/customer participation, lack of willingness and resistance to the project.

5.3 Recommendations

It is recommended, based on those major findings and the conclusions that the agency should take the following measures:

- In order to solve the problems or limitations related with planning and management, the agency should define project management process, introduce/adopt standardized project management tools, framework and methodologies, and customize them in to the agency environment. Separating operational works from projects and treating projects separately from maintenance should also be given due emphasis. Feasibility study needs to be conducted before the projects are started and project charter should be prepared properly. Centralized change, risk, and communication management system should be developed and specifically to risk management, risk check lists should be developed.
- With regard to human resource management, continuous trainings should be given for those who are involved in the project and for the project managers in order to fill the above mentioned gaps and the emphasis should be in creating and developing specialization. Also roles and responsibilities should be defined.
- On the way to solve the problems related with quality standard, assurance and control, the agency should work on developing quality standards and procedures, and working towards those standards with continuous trainings and specialization is mandatory. Having domain experts along with the development team (business experts) in the side of the agency and pushing the customer to incorporate consultants and competent technical representative in their side, incorporating quality requirements in agreements with the customer, availing quality control role and quality management structure, and usage of scientific technical methodologies are also the required jobs to be done.
- Concerning scope, time, and cost/budgeting emphasis should be given and the agency should work towards selecting methodologies, tools and techniques. Requirement gathering and analysis document should be prepared in detail, which leads to clear scope and a realistic estimation of time and cost.
- Procurement of materials and related service should be planed as one part of the project plan and supplier partnership should be considered.

- In working with the customer for the success of the project, the agency should create awareness about the technology they will provide, should make sure that the product is really needed by the users & management, and should present prototypes, and should get feedback on what is understood on the gathered requirements. Having accepted users' requirements facilitates the final product acceptance.

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Appendices

Questionnaire

St. Mary's University

School of Graduate Studies

Masters of Business Administration Program

This questionnaire was developed by the researcher to collect data which helps him to indicate factors which are critical to project success and which will contribute to project failure, project management methodologies & practices were implemented by the organization and challenges faced by the management in implementation of the projects. Therefore all the information you supply through this questionnaire will be treated with confidence and will only be used for the purpose for which it has been collected.

Instructions: Please enter the appropriate response to each statement below.

1. Check one Male [ ] Female [ ]
2. Age ……
3. Tick the years of schooling you completed

Elementary ……..….. [ ]	College/University (First Degree) ….[ ]
High school …….. [ ]	Post Graduate (Masters Degree) ….. [ ]
Preparatory ……..….. [ ]	Doctorial level …….. [ ]

4. How long have you been in the organization? ……years……..months
5. How long have you been in your current Job? ……years……..months
6. What is your role in the project?

Manager…..…..…… [ ]	Partner……..…… [ ]
Observer ……..…. [ ]	Expert……..… [ ]
Others…….. [ ] specify: ……..…	

7. How satisfied are you with your role in the project?

Very Satisfied	Somewhat Satisfied	Slightly Satisfied	Neither Satisfied Nor Dissatisfied	Slightly Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
7	6	5	4	3	2	1

8. Which project management guide/tool do you use most?

PMBOK ….....…… [ ]

PRINCE1 or 2 …...…… [ ]

In house /custom …...……..… [ ]

A combination of different …...……[ ]

Other standard methodology ……..…..… [ ] (Please specify: ……

No methodology …...……..…… [ ]

9. Rate the SUCCESS factors that have played an important role in the success of your project.

		Very Important	**Somewhat Important**	**Slightly Important**	**Neither Important nor Unimportant**	**Slightly Unimportant**	**Somewhat Unimportant**	**Very Unimportant**
1	User Involvement	7	6	5	4	3	2	1
2	Executive management support	7	6	5	4	3	2	1
3	Clear statement of Requirements	7	6	5	4	3	2	1
4	Proper planning	7	6	5	4	3	2	1
5	Realistic Expectation	7	6	5	4	3	2	1
6	Smaller Project Milestones	7	6	5	4	3	2	1
7	Competent staff	7	6	5	4	3	2	1
8	Ownership	7	6	5	4	3	2	1
9	Clear Vision and objective	7	6	5	4	3	2	1
10	Hard working, Focused Staff	7	6	5	4	3	2	1

10. Is there any other success factor that you have identified while successfully completing your project?

No …...…… [ ]

Yes.……...… [ ]..(Please specify) ……....

……....

……....

11. Rate the FAILURE factors that contribute an important role in the failure of your project.

		Very Important	Somewhat Important	Slightly Important	Neither Important nor Unimportant	Slightly Unimportant	Somewhat Unimportant	Very Unimportant
1	Bad communication between relevant parties	7	6	5	4	3	2	1
2	Lack of planning of scheduling, resource and activities	7	6	5	4	3	2	1
3	No quality control	7	6	5	4	3	2	1
4	Milestones not being met	7	6	5	4	3	2	1
5	Inadequate co-ordination of resources	7	6	5	4	3	2	1
6	Costs getting out of hand	7	6	5	4	3	2	1
7	Mismanagement of progress	7	6	5	4	3	2	1
8	Overall poor management	7	6	5	4	3	2	1
9	Supplier skills overstretched	7	6	5	4	3	2	1
10	Supplier under resourced	7	6	5	4	3	2	1
11	Insufficient measurable outputs	7	6	5	4	3	2	1
12	Supplier people not consistent	7	6	5	4	3	2	1

12. Is there any other FAILUR factor that you have identified?

No …...…… [ ]

Yes.……...… [ ]..(Please specify) ……....

……....

……....

Sample size selection chart

Recommended sample sizes for two different precision levels *Source: Isaac and Michael, 1981; Smith, MF, 1983*					
	Sample Size			**Sample Size**	
Population size	**95% Confidence Level**	**90% Confidence Level**	**Population size**	**95% Confidence Level**	**90% Confidence Level**
10	10		275	163	74
15	14		300	172	76
20	19		325	180	77
25	24		350	187	78
30	28		375	194	80
35	32		400	201	81
40	36		425	207	82
45	40		450	212	82
50	44		475	218	83
55	48		500	222	83
60	52		1000	286	91
65	56		2000	333	95
70	59		3000	353	97
75	63		4000	364	98
80	66		5000	370	98
85	70		6000	375	98
90	73		7000	378	99
95	76		8000	381	99
100	81	51	9000	383	99
125	96	56	10000	385	99
150	110	61	15000	390	99
175	122	64	20000	392	100
200	134	67	25000	394	100
225	144	70	50000	397	100
250	154	72	100000	398	100

Source; http://fhop.ucsf.edu/fhop/docs/pdf/pubs/pg_apxIIF.pdf , Sep. 20, 2013

Declaration

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Dr. Temesegen Belayneh. All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Abayneh Mulugeta _____

Name Signature& Date

Endorsement

This thesis has been submitted to St. Mary's University, School of Graduate Studies for examination with my approval as a university advisor.

Dr. Temesegen Belayneh _____

Advisor Signature& Date