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**The Critical Success Factors (CSFs) of Implementing ICT Projects
in Egyptian SMEs**

Master's Thesis

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Declaration:

I declare I wrote the Bachelor's/Master's thesis myself, using only the listed bibliography.

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ABSTRACT

The aim of our study was to provide a contribution to the research field of the critical success factors (CSFs) of Information and Communication Technology (ICT) projects, with a specific focus on smaller enterprises (SMEs). Therefore, the researcher conducted a systematic literature review in order to update the existing reviews of CSFs of Implementing ICT projects in Egypt. On the basis of that review, we led several interviews within Egyptian SMEs that have performed ICT projects. As a result, the researcher showed that all factors found in the literature also affected the success of ICT projects in SMEs.

The literature discusses broadly that the concept of project success still remained a controversial issue for researchers and project practitioners to define. The triple constraint criteria like time, cost, quality does not provide valuable information to efficiently achieve ICT projects. The researcher aims to identify the main drivers of ICT project success which gain particular importance in the light of highly competitive ICT industry.

The research was performed based on highly reputable ICT SMEs in Egypt. The used research method is semi-structured interviews with project managers and project team individuals. A primary and support areas of success factors were identified which might serve as a practical guide for managing ICT projects in Egypt. The most important success factors identified in this research are Top-Management-Support, competencies of the project manager and his team.

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Writing this dissertation has both been challenging and truly rewarding in terms of developing my knowledge within this area. I hope this dissertation will do the same for the reader and create an interest for the researchers and finding about ICT Project Management.

My best wishes to all.

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1. INTRODUCTION

1.1 OVERVIEW

Project management is today a current and highly discussed area. How projects within the Information technology (IT) industry are managed has not changed significantly during the last decades. The IT market, the number of different actors and the way that projects are procured today has however changed. This has led to a gap between the managerial view on how IT projects should be conducted today and how they are actually executed. The fact that the majority of IT projects fail on at least one measure of success, and that billions of dollars in project waste is reported each year (Dockers & Forsellius, 2007), suggests that there is a critical need for improving the way we manage these projects.

The studies done by many researchers in last decade shown an interesting pattern. They compared the large projects that successfully achieved their cost and schedule estimates against those run late, where over budget or were cancelled without completion, six common problems were observed: poor project planning, poor cost estimating, poor measurements, poor milestone tracking, poor change control, and poor quality control (Jones, 2004). By contrast, successful software projects tended to be better than average in all six of these areas. Perhaps the most interesting aspect of these six problem areas is that all are associated with project management rather than with technical personnel (Jones, 2004).

2. LITERATURE REVIEW

2.1 What is a Project?

The Project Management Institute (PMI) defines a project as “temporary endeavor undertaken to create a unique product, service, or result. The temporary term indicated that a project has a definite beginning and end. The end is reached when the project’s objectives have been achieved or when the project is terminated because its objectives will not or cannot be met, or when the need for the project no longer exists. A project may also be terminated if the client (customer, sponsor, or champion) wishes to terminate the project. Temporary does not necessarily mean the duration of the project is short. It refers to the project’s engagement and its longevity. Temporary does not typically apply to the product, service, or result created by the project; most projects are undertaken to create a lasting outcome. For example, a project to build a national monument will create a result expected to last for centuries. Projects can also have social, economic, and environmental impacts that far outlive the projects themselves” (PMI 2014, p.3).

Another perspective of project definition is the transformation of inputs to outputs. The project is decomposed into a small, manageable, and well-understood sub-transformations. A project can be realized in an optimal manner by realizing each task in an optimal manner and the tasks in optimal sequence Corollary (Koskela & Howell, 2002)

The size of the project can be large or small, and it is influenced by one person or a group of people (Schwalbe 2013, p. 4). For an alternate point of view, a project is said to have the accompanying characteristics which are schedule, specifications, budget, limited resources, level of uncertainty on account of the component of variability, and beneficial change in the organization (Westland 2006, p.1).

Additionally, projects vary in size in terms of budget, schedule and specifications. For instance, some projects might take a few days to finish, whereas others might take years to finish (Dekkers & Forselius 2007, p. 2). A project might be also specified by sponsorship who have effective senior management roles, responsible to identify the business needs, problems or opportunities. The sponsor ensures the project remains under control by resolving any aroused problems project (Schwalbe 2008, p. 7).

2.2 The difference between ICT projects and Construction Projects

Dockers and Forsellius (2007) differentiated between ICT projects and construction projects. They emphasized that in the construction projects, the budget might be easily estimated because project managers can easily estimate the cost of square feet or square meter of the historical data, but in ICT projects it is difficult to find the history of the unit cost model. In addition, in construction, project manager easily divide up the work in separate buildings into separate projects, this is not so for ICT projects.

In construction projects, it is easy to monitor the cost of home renovation (altering the floor plan), replacement of insulation, and building a fence around the property yard are considered separate and distinct pieces of work requiring separate costing models. This is not so easy to apply (and not so commonly applied) to ICT projects (Dockers & Forsellius, 2007).

The ICT and software development industry has become process focused through the use of process assessment frameworks such as CMMI®: Capability Maturity Model Integration, ISO/IEC 15504, and others. These models allow organizations and their project teams to identify and improve their development processes (and products) through continuous process improvement. The building industry has no such standardized model projects (Dockers & Forsellius, 2007).

2.3 Project Manager

The project manager (PM) is in charge of leading the project team towards the successful completion of the project (Kerzner 2013, p. 19). The PM is the individual assigned by the sponsor organization in order to set project goals and objectives. The most common traits that PMs enjoy are to be a good leader, stupendous communicator, know how to build and motivate his team, well organized. PMs should also be aware or calculating the projects' risks, provide timely and accurate reports about the project status (Kerzner 2013, p. 12).

PMs should have the ability to advocate the project team and solve their problems in addition to better understanding for the stakeholders' needs and expectations. Moreover, they are responsible to keep the project on track (budget, schedule, scope and deliverables) and update the project plan (Kerzner 2013, p. 12). Moreover, PMs should have to monitor and control the project activities through multiple functional lines. Therefore, PMs should establish good relation with other functional managers, according to their goals and interests (Kerzner 2013, p. 13)

2.4 What is Project Management?

Project management is a combination of activities to organize and manage project resources, assumptions, and constraints in order to produce successful achievement of project goals and objectives. Westland states that project management is a sum of skills, tools, and processes are undertaken to complete the project successfully (Westland 2006, P.1).

In addition, Project Management Institute (PMI) defined project management as “the application of knowledge, skills and techniques to execute projects effectively and efficiently. It’s a strategic competency for organizations, enabling them to tie project results to business goals — and thus, better compete in their markets” (PMBOK, p.5).

Project management is the process of directing and monitoring the project from its beginning through its performance to its closure as shown in figure 2.1. Project management process is divided into five basic processes (Gray & Larson, 2006).

Initiation processes: An idea of the project is clarified for the audience to examine if the project benefits to the organization and realistically can be completed. The high level expectations are defined and resources are estimated at these processes (Gray & Larson, 2006).

Planning processes: The project team identify the details of project scope, schedule, resources and risks, as well as the quality and resources are needed. The project scope may be put in writing to outline the work that should be performed (Gray & Larson, 2006).

Execution processes: includes implementing the project plan, communicating with and managing the stakeholders. The responsibilities are distributed to project team to work on the project activities (Gray & Larson, 2006).

Monitoring and controlling processes: The project team tracks the performance and progress of the project status against the actual plan to ensure that desired results are achieved (Gray & Larson, 2006).

Closing processes: project team finished all the project tasks and the client has approved the outcome (Gray & Larson, 2006).

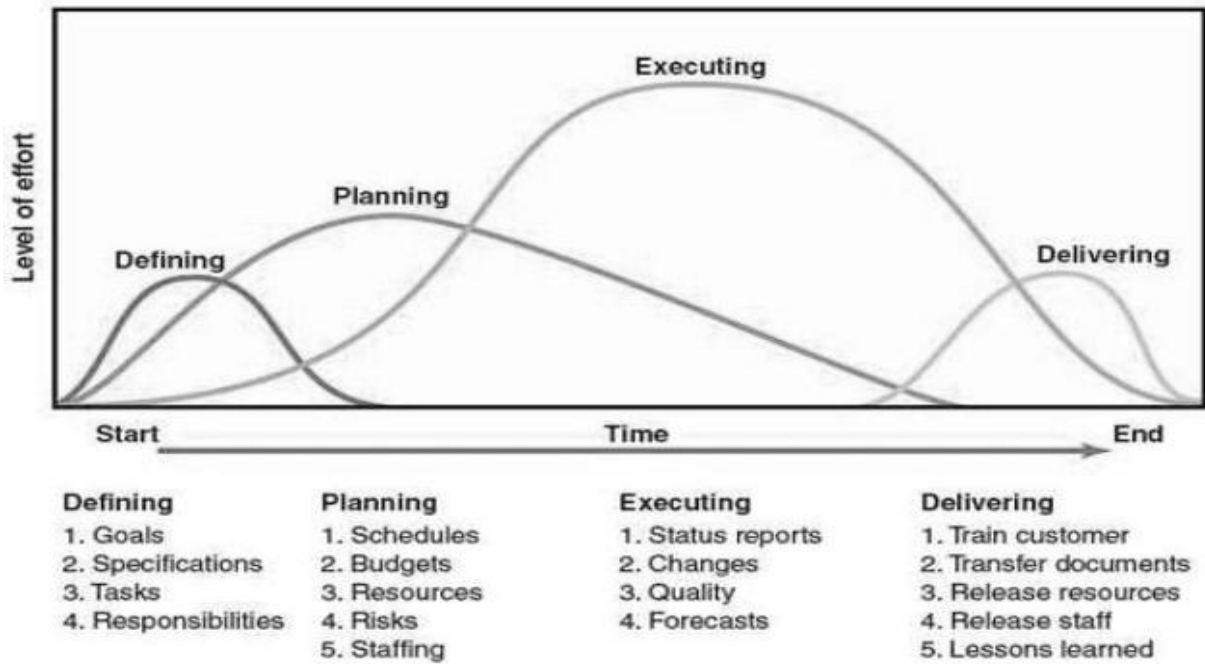


Figure 2.1: Adapted from Gray and Larson (2006, p.6)

Baker et al. (1983) defined project success as follows: “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 in the parent organization, key people in the client organization, key people in the project team and key users or clientele of the project effort, the project is considered an overall success (Baker et al. 1983)”. They paid more attention to the impact of the financial matters as the accuracy of estimating cost and enough cash to finance the project are necessary. In addition, they investigated the human factors and their relation to the project success, they emphasized on selecting qualified team and project manager as a critical factor of success.

Milis (2008) also states that the impact of the triple constraints on the judgment of success is rather small. Other criteria, as there are user happiness and financial or commercial success are far more important. He defines seven success criteria based which are: the seven criteria extracted from the literature are: on time; within budget; according to specifications; user happiness; project team happiness; management happiness; and financial or commercial success.

2.6 CRITICAL SUCCESS FACTORS

Researchers identify the difference project between success criteria and success factors. Success criteria are the measures by which the organization judges the successful results of a project; these are dependent variables which measure project success, while success factors are those inputs to the management system that lead directly or indirectly to the success of the project or business (Davies, 2002, p.185).

Failure to deliver ICT projects is tremendous danger for IT organizations today. In fact, organizations utilize all resources and best practices in the industry to hire the best competent project manager and team. The Standish group reported that, the average number of successful projects (delivered on time, budget and agreed specifications) is under twenty percent (The Standish Group, 2013). In addition, the

Standish group has been collecting case information on real-life IT environment and software development since 1985, in order to outline the eight successful factors ‘

- Clear Business Objectives,
- Project Planning
- Project Team
- Communication and User Involvement
- Top Management Support
- Project Management Skills
- Change Management
- Training (The Standish Group, 2013).

2.6.1 Clearly Defined Objectives

The main reason to implement the ICT project is to achieve specific business long-term objectives which deliver certain benefits to the organization. The project deliverables might be a developed product or service or the result of utilizing these products or service. The more clearly these objectives are defined, the more likely the project achieves defined deliverables (Yeo, 2002).

The project objectives represent an agreement between the project manager and sponsors on the main purpose of the project, thus objectives should be clearly defined in a way that all stakeholders can understand them. In addition, the project success reflects the effective sustainable achievement of the project purpose and long term goals (Khang & Moe). Additionally, defining objectives helps the project manager to declare the success of the project. At the end of the project, satisfying these objectives determines whether the project has achieved the defined purpose or not (Frese & Sauter, 2003)

2.6.2 Planning

Successful projects should be successfully planned. Project plan describes the strategy which project team must follow in order to achieve project objectives (Wohlin & Andrews, 2003). Planning is crucial in software development projects, because it helps the project manager and team to reduce the amount of uncertainty (Wohlin & Andrews, 2003)

. The project manager should start with planning when undertaking any kind of project (Loonam & McDonagh 2007). However, many project managers neglect the importance of a project plan in favor of getting on with the work, which results in wasting time, money and eventually project failure (Salminen 2000; Loonam & McDonagh 2007). Additionally, planning in global ICT projects should take place on the first day of the project, but not neglecting the fact that planning has to be properly done (Biehl, 2007, p. 53).

Projects should be completed within the time otherwise they are invariably going to experience cost overruns because project schedule is highly connected to the cost and scope and any change in scope will result directly in the time and cost of the implementing this change (Lanning, 2001). Thus, precise estimation of the time required to define the cause and implementation of the proposed change is needed to be updated in the project plan (Lanning, 2001).

Many people underestimate the time needed to complete the project constraints (Teo & en 2001). This might happen only if the project manager and his team are not familiar with the activities to be executed. Accurate estimation is one of the most important project critical success factors. Time should be estimated correctly for two main reasons: First, time affects the delivery deadline of project's deliverables and therefore impacts the assessment of the project, project team and project manager. Second, time usually affects the pricing of the project and hence the profitability of the project because the performing organization might be subjected to penalties if the project is not delivered on time.

The first step in estimating the project schedule is understand the project outcome that are needed to be achieved, review the project tasks in detail. Then project manager and his team will have fully detailed tasks and begin to estimate how long

time every task will take (Teo & en 2001). The trick here is also including the time needed for allocating resources, assuring quality, developing the supporting documents, and allow time for training the team, holiday times in key team members, contact with customers, suppliers and other functional managers and staff. All these factors should be taken into considerations and because they might prolong the project time and increase the project cost (Teo & en 2001).

A project risk plan is part of the whole project plan. Risk planning helps the project managers to analyze the risk, weaknesses and opportunities in the organization or operations, and identify the risks that might occur (Teo & en 2001). This will make the project managers more proactive to mitigate or avoid the negative risks and increase the chance of positive risks to happen (Teo & en 2001).

Moreover, risk planning gives organizations the opportunity to be more fixable to deal with the changes that might take place and update the project plan according to these changes (Biehl 2007). Thus, understanding the pressure for change by stakeholders is taken into account as a success factor (Biehl, 2007). Alternatively, there are some external forces for changes that project manager has to anticipate it happening such as economic, technological, and change to governmental legislations (Biehl., 2007). Unexpected risks that require unexpected work activities might take place cause project delay (Teo & en 2001).

2.6.3 Personnel and Team Building

According to the PMI, human resource management includes the processes that responsible for organizing, managing and leading the project team (PMBOK, 2013 p. 266). Many authors replaced the Human Resource term by Personal Management, and is concerned with the approach to manage the organization's most valuable assets- people who have the mission to satisfy the business needs by accomplishing projects (PMBOK, 2013 p. 266).

Brown et al. (2007) emphasizes that team commitment to the project goals is crucial for the project success. Xu and He (2008) examined the success if ICT projects form a team attitude and behavior prospective. They analyzed data from 91 ICT projects collected through an online survey. They found that (1) the commitment of the project team to the project goal has a positive relation to the teamwork, quality, (2) the

commitment of the project team to the project goal has a positive relation to the ICT project's success, and (3) A team's teamwork quality has a positive relation to the ICT project's success.

The project manager should clarify the goals of the project to the team, especially in the initiation phase in order to buy-in their commitment to the project (Teo & Ang, 2001). In addition, the project chart is changed from a project to another, depending on the type of the project, and there is no standard chart for all the projects (Lanning, 2001). Biehl (2007) points out that organizations involve people from different cultures and backgrounds possess a high level of project success.

Once the project team is formed, it is most likely to have conflicts or at least different prospective to achieve the project goals (Soja, 2006). The conflicts is not always disruptive if the project manager encourages the team to share ideas and open-mindedness (PMBOK, 2013 p. 267)

In new projects, project managers usually have the full authority to build and acquire the team. When forming a team, strong negotiation skills are applied to ensure having the most skilled people in the projects (Soja, 2006). In the case of existing projects, the project team is already staffed and has distributed assigned responsibilities (Soja, 2006).

The project manager has to confirm the availability of necessary individuals and acquire them to perform the project activities (Soja, 2006). The team's adequate level of ICT knowledge is crucial for the project success, especially in the initiation of the project (Brown et al 2007). As well as the ICT knowledge is important, the personal skills are also critical for the cohesiveness of the team (Loo, 2003)

2.6.4 Communication and User Involvement.

Many authors pointed out that one of the most threats to the project success is a failure to communicate effectively (Al-Mashari et al., 2003; Loonam & McDonagh, 2007; Mabert et al., 2003; Brown et al., 2007).

Teo and Ang (2001) stated that communication is a critical success factors and should be floated freely between the project manager, team and other stakeholders especially in the launching phase. However, unnecessary communication might lead to add some risk to the project for example cost overrun (Mabert et al 2003).

As Lanning (2001) highlights that most of the aroused project problems such as unclear scope, unrealistic schedule or budget result from poor communication. Moreover, ICT projects are always characterized by request for change and these requests encompass always technical jargons, which are difficult to be understood by non-IT staff like senior managers. Therefore, technical aspects should be simplified to be more comprehended by non-technical staff if they need to understand the technical side (Lanning, 2001).

Lanning (2001) also added that one of the important reasons behind the failure of ICT projects is the concentration on technology while neglecting the need of communicating strategic and organizational aspects of implementing the project.

According to Kitchen and Daly (2002), communication is essential to distribute the performance information such as, status reporting, progress measurements, and schedule and cost forecasts. Project communication always concerns to collect information about scope, cost, quality, and risks and convey this information to stakeholders (Lanning, 2001).

Furthermore, communication carries the credibility to manage project changes because it is an important tool to announce, explain, and prepare the stakeholders for the required change and elaborate the positive and negative effects that changes might bring to the project (Kitchen & Daly 2002).

2.6.5 Top-Management Support

Many authors emphasize in their research that top management support is substantial for ICT project success factor (Davenport 1998; Mabert et al 2003; Brown et al 2007; Soja 2006). In addition, Loonam and McDonagh (2007) reveal that support of senior management is considered as critical success factors for ICT projects. Teo and Ang (2001) also highlight that top management support should be in all the project phases.

Zwikael and Globerson (2006) pointed out that many organizations have adapted many techniques to focus on the most effective processes. These techniques are called Critical Success Processes (CSPs). The techniques adapt the procedures that project manager might implement them from the initiation to the closing phase of the project, and the top management support is an ongoing process in all the project's phases. This support includes training, initiating PMO (Project Management Office), selecting project team, developing project organizational structure and defining the project success criteria (Zwikael, 2008).

Senior managers should make sure that the goals and objectives of the project should be linked to the organizational strategy. Moreover, they should engage actively in the execution, monitoring and controlling; and also communicate effectively with the team members to resolve any conflict that might arise (Salminen, 2000).

Loonam and McDonagh (2007) found that project management and championship is critically needed for project success. They defined top management support as top management being involved in the project in three different ways (1) as champion, (2) by providing resources, and (3) by participating in the project. They emphasized that project champions is critically important because they represent as project symbol of the organizational authority to empower employees and increase their commitment to believe that change project is necessary.

Additionally, leading the project team effectively is a crucial factor for success of ICT projects (Lanning, 2001). The effective leadership style motivates the project team and bring the organization closer to success of the project (Al-Mashari et al., 2002). Top-Management participation in organizational change projects is an essential success factor (Salminen, 2000). The successful change projects are endorsed by leaders who enjoy the authority, capability and confidence to achieve the result successfully.

2.6.6 Project Manager Skills

Successful project managers are highly demanded in organizations which seek to deliver successful ICT projects, especially in the current dynamic market. Successful project managers should understand the business to communicate effectively with suppliers, customers, sponsors, and other functional managers (Lanning, 2001). This allows project managers to establish rapport with the key project stakeholders to achieve project objectives, targets, reach goals, mitigate problems and mitigate risks (Lanning, 2001).

Project managers should enjoy initiation and planning skills. Project managers are responsible for establishing the required document format, communication among the team, change control processes and plan the baselines required to measure any variance against (Loonam and McDonagh 2007).

In addition, managing technology, people and change in order deliver the project on time and within budget are critical success factor of projects. In addition the ability to lead the project team by making them motivated and committed to achieve the project goal. Effective leadership requires the project manager to commit, demonstrate ethical practices.

Moreover, Teo and Ang (2001) pointed out that establishing standards for the ethical behavior and living according to these standards, and reward the individual who follows these standards, are responsibility of successful project managers (Teo & Ang, 2001). Moreover, it is also expected the effective project managers share problem solving skills, because they carry out the responsibility to solve problems within the team (Teo & Ang, 2001).

Therefore, project managers should be chosen based on their ability to effectively lead the team rather technical expertise. They should have the leadership expertise in challenging, inspiring, enabling, modelling and encouraging the team to achieve (Teo & Ang, 2001).

2.6.7 Change Management

Most authors affirms that organizational change management is directly connected to ICT project success and they consider it as a critical factor for successful project

implementation. Wognum et al (2004) noted that there is rare to find ICT projects do not include changes during their life cycle. Similarly, it is very rare to find changes that do not affect schedule, cost, and quality specifications of the project. Performing organization should record, evaluate, and manage these changes to ensure that changes are appreciated by the party asked for changes, and the party carrying out changes is getting paid where these changes affect the original specification of the project (Wognum et al 2004).

In many ICT projects, the contracts have always the terms and procedures to deal with any introduced variation or change (Mabert et al., 2003). Therefore, in practice, when a client requests changes either verbally or by change request, it must be reviewed and confirmed from the by the responsible individuals and be sent back to the client with a report shows how these changes can impact time, cost, or quality of the delivered project (Mabert et al., 2003).. Then, this report will be directed to the board who can make the decision to accept or reject the change. If the change has been accepted, the project plan should be modified to handle these changes and then put them in the execution phase according to the agreed change procedures.

As soon as changes have been accepted, the cost, time, quality variations must be updated in the project plan respectively to give modified baseline values against which costs and schedules will be monitored (Mabert et al., 2003).

Additionally, when changes are requested by the client, project schedule and budget can be updated, and the client pays for the extra cost added to the project specifications (Salminen, 2000). When the changes are requested by the performing organization due to discovered error, omission, or necessary improvement, it is not possible to increase the project budget unless the client has agreed to this. Hence, the performing organization must carry the extra cost and it will be deducted from the profit (Salminen, 2000).

Change management must not be confused with management of change, which concerns of changing organizational culture and effective manage of human reactions (Al-Mashari et al. 2003). For instance, changing the attitude of the organization's individuals, from the top-management level to the executive and operational level. These types of changes can be managed throughout psychological

approaches to change constructively the employees' behavior (Al-Mashari et al. 2003).

Organizations also have to adapt a change management system to provide a standard process for submitting, documenting and reviewing and prioritize changes (Kim & Oh, 2000). The change management system is responsible to identify proposed changes, who has the authority to approve or reject changes, and the impact of these changes on the whole project plan (Kim & Oh, 2000). This will provide the organization with enhanced procedures to track changes and their effect on the project baseline (Kim & Oh, 2000).

2.6.8 Training

Organizations seek for success need to provide end user training within the phases of deploying new ICT systems. Unfortunately, end user training problems usually arouse as important reason for ICT project failure (Loonam & McDonagh 2007, P.39-112). Lanning (2001) correlated between training and change management, because when performing organization trains and teaches end users how to use the new deployed system, they become more likely to accept the changes (Siddiqui et al 2004). This view has been accepted by Sharma and Yetton (2007) who suggested that training is the most important factor after system implementation because it leads to high level of user acceptance and system success.

Al-Mashari et al (2003) pointed out that effective training should be started with appropriate planning. Furthermore, it is important to start training process early with starting up the project. If the training waits until the end of the project, the organization will not have enough time to do it (Mabert et al., 2003). In addition, the project manager should start with the development of training strategy as it the first deliverable to consider.

AS soon as the project manager collects the business requirements, he will be able to figure out the required training (Mabert et al., 2003). Next, the project manager and team create the training plan, which usually takes place during the design phase. The training plan includes the required detailed steps to implement the training strategy. It

also defines how the training will be developed, executed, monitored and controlled, and evaluated, in addition to the duration of training deployment (Mabert et al., 2003).

The end user training facilities and resources have been given the least amount of concern, as most organizations do not arrange the needed resources properly (Gargeya & Brady, 2005).

Williams (2007) also emphasized that training in ICT projects is not given the sufficient amount of human resources. This indicated that one of failure reasons to implement the ICT project is because the lack of the resources. Loonam & McDonagh (2007) reported that training cost is nothing compared to the gained benefits, because when the organization spend about 10-15% of the budget for training, the chance for ICT project implementation will reach to 80%.

3.0 METHODOLOGY

3.1 OVERVIEW

This chapter aims to provide an overview of the methodology deployed in this research and How the data were collected and evaluated. Furthermore, it clarifies how the research problem has Been solved. It started with the research approaches and research design, data collection methods as well as a description of how the data are analyzed.

3.2 THE RESEARCH OBJECTIVES

The main objective of this research is to examine the critical success factors (CSFs) of implementing ICT projects in Egypt, with a specific focus on Small and Medium Enterprises (SMEs).

3.3 SCOPE OF THE RESEARCH

Therefore, the researcher conducted a systematic literature review in order to reflect success factors from academic and practical fields and ICT industry. In addition, the researcher conducted several semi-structured interviews with Egyptian SMEs that have implemented ICT projects. As a result, the researcher found that all the factors reviewed in the literature also affected the implementation of ICT projects in SMEs.

3.4 DATA COLLECTION

The choice of data collection technique is a final step in the methodology design process (Saunders et al., 2007). In order to collect data about the ICT industry in Egypt, semi-structured interviews were conducted with project managers and project team members of ICT SMEs companies in order to identify the critical success factors of implementing ICT projects.

3.4 THE QUALITATIVE DATA COLLECTION METHODS

The qualitative research methods can be described as an assistant in terms of providing a comprehensive explanation of complicated phenomena in relation to the creation of theories as and formulating a certain proposal of hypotheses to classify a certain phenomenon (Matveev, 2002).

Researchers would normally have the objective of collecting a comprehensive understanding human behavior as well as the logical reasons which are understood to effectively govern such behavior (Denzin & Lincoln, 2005).

In essence, Qualitative research is used to help the researcher to understand how people feel and why they feel as they do (Marshall & Rossman, 1989). It is concerned about theoretical assumptions and interpretative paradigm which are premised on the social beliefs that have been created and sustained through the subjective experience of the respondents that have been involved in the research (Morgan & Smircich, 1980). Indeed, qualitative research is likely to happen in more natural settings (Denzin, 1971; Lincoln & Guba, 1985; Marshall & Rossman, 1989). Researchers have to understand the using of different approaches in relation to data collection. The following methods are normally relied on by qualitative researchers described by (Marshall & Rossman, 1989).

- Participant and Nonparticipant Observation
- Reflexive Journals
- Structured and Unstructured Interviews
- Analysis of documents and materials

The following are the positive aspects of the qualitative method

- The qualitative research helps to acquire more realistic views and perceptions of the world which is incapable of being experienced in the numerical data as well as statistical analysis that is utilized in quantitative research (Matveev, 2002). It also provides a highly flexible method of performing data collection, analysis, and more importantly, the interpretation of the collected information (Matveev, 2002).

- The qualitative research provides a holistic view of the phenomena that is currently under investigation (Bogdan & Taylor, 1975; Patton, 1990).

Kirk and Miller (1986) confirmed that qualitative research offers long-term personal interactions with the respondents in regard to their own language as well as one their own terms. The following are the negative aspects of the qualitative method Matveev (2002) stated the negative aspects of the qualitative research:

- It has the effect of departing from the main research objectives in relation to the nature of the main context;
- It has an effect to achieve non-consistent conclusions based on the same collected data depending on the differences of personal characteristics from the researcher to the other;
- It causes a failure to investigate properly the direction of causality that exists between different research phenomena;
- It typically requires an experienced researcher in order to collect the actual data from the respondents;
- It causes the inconsistency and the unreliability because the various probing techniques that can be employed by the researcher and the respondent can provide particular information about some issues and ignore others.

3.5 INTERVIEWS

Frey and Oishi (1995, p. 1) defines interviews as "a purposeful conversation in which one person asks prepared questions (interviewer) and other answers them (respondent)". Interviews can be considered as the most challenging and useful measurement tools to gain information about a particular topic and can be considered as the most widely employed method within the realm of qualitative research (Trochim, 2006).

Interview requires staying with the designed protocols as well as personal sensitivity and adaptability (Trochim, 2006). He also clarified that there are few issues should be considered when conducting interviews in relation to the completeness, accuracy, existence of bias and confidentiality of interviews. It is crucial for the interviews to be taken down on paper just like it was recorded and it must also be analyzed as being stated by the participant (Trochim, 2006). It is also essential that there is no additional information that flows from the interviewers assumptions is added to the interviews.

In addition, participants should also be aware of the purpose of the interview and not to be tricked into giving an interview. As far as qualitative interviewing is concerned, Interviews can be classified into two styles which are (structured (closed interview style) or unstructured (open interview style). The first style is the structured interviews (standardized interviews) and can be defined as "one in which the primary questions have been predetermined and are asked using the same standard words for all the participants" (Maccoby & Maccoby, 1954, p. 451). There might be a single question which the interviewer would ask and the interviewee would then be permitted to respond freely and the interviewer would be responding to points which would be worthy of a follow up. In contrast, the semi-structured interviews can be defined as informal interviews that maintain the structured format and allows the interviewers to deeply investigate the initial responses of the participants to get more details of the answers of the asked questions (Wimmer & Dominick 2000, p. 156). The semi-structured interviews give the interviewers the flexibility to effectively probe or even ask certain follow-up questions (Trochim, 2006).

3.5.1 INTERVIEWS DEVELOPMENT

The researcher conducted the interviews with five SMEs located in Egypt (Cairo, and Alexandria). The selected SMEs have implemented a wide range of ICT projects. The total number of interviewees is thirty. The interviewees have six years of experience of performing ICT projects on average. Additional reasons for selecting interviewees was their involvement in ICT projects in Cairo and Alexandria, which are the biggest trade cities in Egypt.

Table 1 provides an overview of the selected companies and interviewees in terms of interviewee positions, date of the interview, and duration of the interview. The interviews were conducted in retrospect to the ICT projects between October 2014 and January 2015. Both personal (face-to-face) interviews in addition to telephone interviews were conducted by the researcher.

Due to time limitation and the international distance between interviewer and interviewees it was hard to conduct all the interviews on face-to-face basis. In fact, 19 interviews were conducted face-to-face, and other interviews (11) were conducted throughout the internet telephony in order to avoid the high cost international call fees. This internet telephony approach was supported by Bryman and Bell (2003) as the most convenient way to save time and money.

Table 3.1: The selected Companies and Interviewees

Company	Interviewee	Date of the Interview	Duration of the Interview
A	Two Project managers and four team members	18 – 22/11/2014	45 min for each interviewee
B	Two Project managers and four team members	24 – 29/11/2014	45 min for each interviewee
C	Two Project managers and four team members	1 – 6/12/2014	45 min for each interviewee

D	Two Project managers and four team members	8-13/12/2014	45 min for each interviewee
E	Two Project managers and four team members	22-26/12/2014	45 min for each interviewee

The next section provides information about the selected SMEs as well as a short overview about their performed projects. The researcher does not present the companies, namely, instead alphabetical labelling is used in order to keep the companies anonymous.

COMPANY A:

Company A offers a broad spectrum of turnkey solutions for networking products and services, allowing its customers to quickly deploy LAN, MAN, and WAN environments to fit their networking needs and budget. Company A offers a variety of core technology solutions that require strategic partnerships and teamwork with the leading manufacturers and suppliers in the industry like HP, McAfee Elite, Microsoft, Symantec, Cisco, 3Com, Intel Premier Provider and more. Company A is recognized as one of the largest national hardware and software distributors today.

Headquartered in Alexandria, Egypt, the company provides highly innovative and reliable solutions to its customers. The company philosophy has always focused on customer satisfaction with uncompromising integrity. Since inception, the company has grown commendably as a provider of excellent products, backed up with superb support system.

COMPANY B:

The company offers Portals, Business Intelligence, Enterprise Application Integration, and Application Development Outsourcing services to Global 2000 companies. Company B serves Governments, Financial Services firms, Educational institutions, Telecommunication operators, and Media companies in Cairo and Alexandria.

Company B has partnered with Magic Quadrant technology vendors - Microsoft, Vignette, IBM, Oracle, MicroStrategy, Informatica, Ounce Labs, and Intel.

COMPANY C:

Company C covers a full spectrum of software, from Internet, to Client Server, to Desktop based applications. It has the experience of providing turnkey solutions with high quality standards. Its project management experience gives it the expertise required to ensure an effective and reliable service delivery.

Company C offers full cycle custom software programming services including offshore software development, analysis, design, implementation and outsourcing. Company C offers you turnkey solutions with high quality standards.

Company D:

Company D was founded to provide organizations with innovative and proven software solutions, as well as comprehensive consulting and technical support to help organizations achieve their business goals in Egypt and Middle East region.

Company D was established as an Official Business Partner of SunSystems renowned business and financial software. Company D is a specialist in three main fields ERP, infrastructure and security. During a very short period of time Company D achieved a noticeable success in many fields and with different partners.

Today, Company D is a leading provider of business management and infrastructure solutions giving its customers choices and flexibility while building a highly secure and stable computing environment. Company D provides a full-range of solutions for the enterprise, including ERP, Infrastructure and security services. Companies can be confident that they will find in Company D a highly skilled and dedicated partner; a partner who understands the needs of its clients, and is committed to their success in this region.

Company E:

Company E is an Egyptian Information Technology Solution Provider offering offshore software development services to enterprises worldwide. Since its inception in 2001, the company has focused on one basic principle "Maximize leverage" by generating savings in cost, increased productivity, time to market and enhanced quality.

Company E specializes in providing outsourced software product development services and custom-made software solutions to companies across the globe from USA, Europe and the Middle East. The company offers Portals, Business Intelligence, web applications and Product Development services focusing on Travel Firms, Educational institutions and Retailers .

Company E develops high-quality, multi-platform products for a wide range of platforms, operating systems and embedded Internet products. The company strives to offer a superior Internet experience through state-of-the-art technology, innovation, leadership and partnerships.

3.5.2 CONTENT ANALYSIS

Content analysis is an observation technique used to analyze written material into meaningful units using carefully applied rules (McDaniel & Gates, 2001, p. 152). It is an objective, systematic description of the content of the communication, rather than behavior or psychological objects. It is defined as objective, systematic and quantitative

description of the manifest content of the communication. It includes observation as well as analysis. The unit of the analysis may be words (different words or types of words in the message), characters (individuals or objectives), themes (propositions), space and time measures (length or duration of the message) or topic (subject of the message) (Malhorta & Birks, 2013, p. 246). The analysis of these units involves transforming the often qualitative, open-ended survey responses into quantitative data. This may involve developing coding procedures, establishing the reliability of the coding procedures, and developing careful data screening and cleaning procedure (Marczyk, et al., 2005, p. 153).

In qualitative research, content analysis is one of the classical procedures for analyzing textual material. The text being analyzed may come from narrative held in

brochures or advertising copy through to dialogues held in interview data (Malhorta & Birks, 2013, p. 246). Primarily, the objective of the content analysis is to 'reduce' the data, to simplify by summarizing and structuring the data according to rules derived from existing theory (Malhorta & Birks, 2013, p. 246). In effect, therefore, content analysis as a quantitative technique based on classifying and 'counting'.

4. ANALYSIS AND FINDINGS

4.1 Overview

This chapter is provided to analyze the data that was collected throughout semi-structured interviews. As described by Miles (1994) qualitative researchers have always rich information, which makes the data analysis quite difficult.

The analysis of the interviews was divided into two major phases:

- First phase: defining the project's success
- Second phase: critical success factors.

As has been already mentioned in the section which concerned about the data collection process, the researcher kept the companies and interviewees names anonyms for confidentiality, instead he used the following abbreviations to refer to companies and make references regarding the conducted interviews (A, B, C, D, E).

4.2 First Phase: Project Success Criteria:

As mentioned in the literature, the most famous criteria to measure the project success have been known as "Golden Triangle" or "Iron Triangle". Hence, the project is perceived as successful when the variables of time, cost and quality are fulfilled (Atkinson, 1999, p338). There was a consensus among respondents that meeting the project time, agreed budget and quality standards are the main criteria to assess the achievement of implemented ICT projects, but some of them added some criteria to the golden triangle.

A project manager of company A stated that meeting the needs of the customers is at the top of the list, and agreed of levels of project success by Dalcher (2008).

For company B project managers and team members declared that budget is very important criteria, but the developed software should furthermore satisfy the users. For instance, the B company project manager stated "... we want the users be satisfied with our software so they will come back again...ROI and large market share generated are also important criteria to judge the project".

A project manager of C who is currently involved in assessing projects from the different stakeholders' perspectives emphasized the importance from whom these success criteria are set up. "For the last project we got the best critique ever and the demanded company stated that this was the developed software met the needs, but the users on the other hand was kind of disappointed because the software has not fulfilled their expectations and it was complicated to use it"

To sum up the results, it can be emphasized that all the interviewees believe that they have to meet time, cost and quality when perform ICT projects, but without meeting the stakeholders' needs they would not consider the project to be successful.

4.3 The Second Phase: Project Critical Success factors:

4.3.1 Project planning:

As has been mentioned in the literature, project planning plays an important part as a critical success factor of implementing ICT projects. This context must be stated when asking Respondents about the critical success factors regarding ICT project planning phase, not all the interviewees have been familiar with the planning phase.

Project managers and Team members of A and D are aware of project plan, but they do not employ it, whilst team members of E never heard about such a phase and they start directly executing the project. A team member in E stated "... We used to employ balanced scorecard, and this tool informs us that we are on the right track- we have little experience working with what is called project plan- using our balanced scorecard make our work easier but we face a lot of chances for waste and mistakes".

This finding is aligned with Loonam and McDonagh (2007) who pointed out that many project managers neglect the importance of a project plan in favor of getting on with the work, which results wasting time, money and ultimately leads to project failure.

On the other hand, all the respondents from B and C emphasized the importance of the project plan and usually look at the historical record of their past projects to make it more realistic. A project manager of C stated that "the success of projects depends on to what extent your plan is clear and accurate, taking into your account your past

experience to make your plan more realistic”. The interviews revealed that one of the critical factors for project success is having a well-developed project plan, which should be started with when undertaking projects (Loonam & McDonagh, 2007).

4.3.2 Well-defined Objectives:

The responses to this interview question exposes that the definition of objectives might vary from company to another, for instance, companies A and C perceive objectives in providing high quality product to their customer and see the potential in promoting their names.

The aim of implementing most of ICT projects by company A and C is to maintain their position in the market. Project manager of A stated that “... we know that we are not the cheapest in performing ICT projects, but our primary objective is to deliver high quality product and service to customers, that is why we take into account every small detail.

Another company like E concerns more about reducing cost in order to differentiate itself by providing low cost products and services. For example, a team member emphasized that “... our main objective is to effectively manage our ICT resources by following the predefined compliance of the budget baseline and cost saving in operations”.

Moreover, respondents from B and D have different objectives of the projects performed by their companies. For instance, project manager of B stated that, “we are performing IT projects for the essence of excellence”. The answers to the interview questions revealed that these companies aim to achieve competitive advantage over the other rivals such as A and C who have already established their positioning and market share.

In summary, the responses of interviewees revealed that working with clear objectives is the first step in performing ICT projects. This step specifies the desired end result to be achieved by ICT projects. Most ICT project management practitioners do not spend adequate time on defining objectives, thereby ensuring an unsuccessful project by pushing the project into cost overrun, missing milestones and unhappy clients.

4.3.2 Project Team

Another critical success factor that is recognized from the interviewees, the project manager's ability to actively manage the project team in order to ensure that their performance is according to the project management plan.

All the respondents work in matrix organizations, meaning that the project manager does not have any direct authorities power over the team. Consequently, the team members have to report to different functional managers, and these managers evaluate each team member according to his/her performance in the functional department. For instance, project manager of B stated that "... the project team in a matrix organizational structure is usually selected from different fictional departments. A team member might be loyal to his functional manager more than the project, and this will cause project failure, that is why cohesiveness between the project team is crucial".

The interviews aroused important factor, which is rewarding the project team according to their desired behavior, result, or acquired skills. This makes the team cooperating smoothly and finally achieve the project goal. Project manager of E revealed that "I always recognize my team and reward them, sometimes in the form of saying thank you, providing a certificate of recognition, bonuses, and holidays.... Make my team more motivate to achieve the desired project goals".

4.3.4 Project Communication

The interviewees were asked questions about the importance of project communication. The results of the respondents from A, C, D, and E led the researcher to conclude that: First, there is an evidence that project team communicate with each other verbally, informally, and for short duration and with a small number of project individuals at the same time. Moreover, the informal verbal communication is sometimes supported by exchanging graphs, handouts, and also results on the computer. Second, the high expectations of each individual that his coworkers will listen to him carefully and respond clearly to his questions. For instance the CIO of A emphasized that "...sometimes we miss milestones and deadlines, our companies hit by huge financial penalties, and also this affects our reputation"

For company B, there is an evidence of good communication between the project manager, team and other stakeholders. The project manager stated that “I spend more than 70% of my time in communication, including determining the people I am going to communicate with, the way to communicate with them, such as holding meetings, sending emails, where is the place of communication? What is exactly the needed information?”

The result of interviews is aligned with Loonam and McDonagh (2007) who emphasized that communication is a critical success factor for project and information should be conveyed freely between the project manager, team and other stakeholder. In addition, determining the type of information for each stakeholder and when he/she needs, it is also an important factor for having good communication.

4.3.5 Top-management-support:

The analysis of interviews of A, B, D revealed that senior managers provide clear direction for the project and maintains the link to the organizational strategy, which provides the boundaries for the performed projects. Moreover, senior managers play an important role to ensure the project execution is within budget and on time by providing feedback to the project manager and his team about the status performance reports. For instance, the project manager of A stated that “... senior managers always come to review the status reports and discuss the problems with us, and show us the way to solve them”.

Additionally, the senior managers play the champions role as project advocates, to convey the project vision to the team and influence them to be committed to the project. For example, a project team member of B stated that “when the project is very close to success, the CEO recognizes us publicly and say good work”

On the other hand, senior managers of company C and E used do not devote sufficient time to monitor the project and provide feedback, which is a cause for overrunning cost and missing deadlines for some projects. The project manager of company E stated that “senior managers are often busy with their daily job, and do not have time to talk with us about the project, then we fail sometimes to achieve the results”.

4.3.6 The competencies of the Project Manager:

The analysis emphasizes the fact that, all the interviewed project managers possess the leadership skills and have a vision of where to go and how to achieve it. A team member of B stated that “our project manager always lifts me up, discuss with us the project’s vision, and rewards us when we do successful activity”.

The interviews endorsed that project managers have excellent communication skills, and they able to communicate with all levels of the people at the organization. The trait of leadership needs clear communication about the project goals, the responsibility of each team member, performance evaluations and feedback. A team member of C Seyed “the project managers talks with us about the goals we are going to achieve at each stage of the project, divides the responsibility and gives us positive feedback about our performance.. This makes projects easy and enjoyable”

4.3.7 Change management

All the interviewees believe that change requests should be done through the standard procedure in their organizations. Stakeholders should submit what is called “change request” when they ask to change requirement in the scope. The procedures for organizations should be written and specifically as possible.

The project manager adds the changes to “change log”, which is a register to add changes and assess them. Then, changes are prioritizes according to their necessity to the project. For example, project manager of A specified that “when we receive change requests, we classify them... critical, important or nice to have”. This provides the organizations with information about which changes should be done first.

Then project manager and his team have to assess the impact of changes in the technical design, project schedule, and project budget. Then the project management plan should be updated according to the impact of these changes in order to determine the level of efforts to make these changes happen. Project manager of C added “... the most important step is to analyze the changes and see what areas of

your project is likely to impact, do you need to increase only the budget or only the time scale or tradeoff between changes”

Finally, the project manager and his team have to decide whether they accept or reject changes. Once the decision is made, it would be conveyed to the key stakeholders and anyone that affected by the change. If the change is approved, project management plan should be amended in order to execute the changes according to the new plan. Company B project manager emphasized that “... once we finished all the steps in the requests, we should inform the other IT staff to implement the changes, this could be the IT developer, tester, architect, or anyone else who is impacted by the work”

4.3.8 Training

The findings of interviews possess that ICT projects acquire individuals from different backgrounds and levels. This leads organizations to design and budget comprehensive and on-job training programs for the project team and users. Project manager of A stated that “we hire the young and smart people and let them cooperate with the professionals in order to learn from their extensive experience, it is a part of our ICT strategy”.

When starting a project, the project manager establish training strategy for the prospective project. First, he determines the required skills to perform the project and then check the available skills inside the organization and negotiate with their functional managers to let them working in the project. Project team member said that “we look of how much individuals are needed for the projects, managerial people might want to get training on net IT skills, and what kind of new skills are requires, such as problem solving and communication skills”

Moreover, the findings revealed that organizations should have of an annual training plan for IT staff as well as the people from non-IT background. The respondents emphasized that organizations have a continuous training plan, which allows managers to elevate the performance of their human resources. For instance, implementing new applications might requires new skills and behaviors of the team to achieve the project successfully. A team member of D stated “... we get specific training for each specific project, on-job-training is our famous model besides video

conferences, and multimedia training kits; we also train the end-users to use the developed applications)

5. CONCLUSION, RECOMMENDATIONS, AND LIMITATIONS

5.1 Conclusion and recommendation

The purpose of this research is to get insight in understanding the CSFs for implementing ICT projects, focusing on IT SMEs in Egypt. This research in the field of ICT projects and their CSFs adds value to the organization, because it might increase the likelihood of ICT project's success through the valuable information provided.

The literature review was carried out to identify the CSFs leading to ICT project success. The researcher found more than 110 papers focusing on CSFs. The majority of reviewed literature is in the form of surveys and case studies.

For this research, qualitative research method was used in the form of semi-structured interview. The information that was collected here was analyzed comprehensively. The interviews were conducted with project managers and project team members of five SMEs companies in Egypt. The interviews were designed to get the perception of the CSFs in the implementation of ICT projects. The result of the analysis was very important to satisfy the project objectives.

The project manager is assigned to a project based on his technical experience and managerial soft skills, or availability. However, the project manager always tradeoff between his technical background and managerial soft skills based on the nature of the project. In addition, the project manager commitment to the organization's goals is CSF for the success of the project, which he can possess a commitment to user satisfaction and team working. In addition, the project manager is a leader, by having a positive attitude, flexible, proactive, and motivating the team. He always

sees the big picture, and knows the talents and interests of people around him and delegate tasks accordingly.

The success of the project depends on having the skilled people at the right time. The project manager should be capable to assemble skilled human resources. The project team should have the competency and capability. Competency means that they are qualified to perform the task assigned to them. Capability means having the adequate level of skills to perform this task within the specified time. SMEs is always hesitating to pay more in order to hire senior professional people, that is why they hire young and smart people and train.

Communication is truly one of the Critical Success Factor in ICT projects. Effective project communication not only keeps the stakeholders updated about the project status, but also increases the buy-in of stakeholders in making the major project decisions. Therefore, Maintaining open, regular and correct channels of communication with all levels of the project team and stakeholders are significant to making sure the sleek flow of directions from client to plant floor and sparse warning of risks and changes to alter early assessment and preparation.

Matching personalities to roles is not enough, training is the also essential not for acquiring and sharing knowledge, but also important to increase the efficiency of the project performance and reduce the dependency on external entities. The project manager should take into consideration to describe the nature of training required to accomplish the project when he establishes the training strategy.

Clear business objectives are crucial for most successful ICT projects. However, in SMEs ICT projects there is high level risks since they have shorter life cycles than big

Enterprises. For this reason, project objectives should be well defined and concise and have a high level of focus.

All projects need to have a commitment from the project sponsor who support the projects and carry the responsibility of project deliverables. In SMEs, the experience and power of the project sponsor is not important as much as the adequate mount of time he should spend on monitoring the project. Thus, he should not load himself in his main job function.

The change management of the project scope is critical factor for success. Any change happened to the project scope, can significantly affect the cost, time, and quality. Thus, the scope should be well defined in the planning and estimation phases. As the researcher showed, there are many reasons behind changing the scope, such as stakeholders may add requirements during the execution phase of the project. So, the project manager has to define, communicate, reconcile the emerged requests throughout the project execution.

5.2 LIMITATION:

There are some limitations that should to be addressed regarding this research. The first limitation concerns the number of the interviewees. The study is limited in so far as the number of participants is only 30 of the ICT project practitioners.

Another potential limitation should be acknowledged is related to generalization as only five ICT companies in Egypt were used for this study. Further researches should need to contrast the Egyptian companies with other companies from different country. This study is limited by the budget availability and strictly limited by the amount of time available. In fact, the companies allowed only to interview 30 interviews, because the busy schedule. In addition, the quantitative analysis of other stakeholders is also required (questionnaires) to empower the research.

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APPENDIX 1

SAMPLE OF INTERVIEW QUESTIONS.

First Part (Information about Interviewees)

- Could you please give a brief overview of the company's background?
- Could you please describe your responsibilities in the project.
- Could you please give a short overview of your previous experience in managing projects.

Second Part (Defining success Criteria)

- What are the criteria you use to evaluate your project success?
- Are these criteria defined before the project starts?
- Who defines these criteria?

Part three (critical success factors)

- Which critical success factors have you identified in your current project?
- Which critical success factors have you identified in your previous project?
- Do you have specific goals and objectives of your current project?
- What are the goals and objectives of your current project?
- Do you estimate time, budget for this project?
- How long does this project approximately take? How much does it cost?
- Do you meet with the project manager? How often?
- Does the project manager help you when you ace a problem?
- How often do you report to the project manager?
- To what extend your skills matches the requirements of this project?
- Did you get any training?