ADDIS ABABA UNIVERSITY SCOOL OF COMMERCE DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Critical Success Factors Of Enterprise Resource Planning Implementation And Their Impact On Organizational Performance At Commercial Bank Of Ethiopia.

A Thesis Submitted To School Of Commerce, Addis Ababa University, For The Partial Fulfillment Of Masters Of Arts Degree In Logistics And Supply Chain Management

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SCHOOL OF COMMERCE

"Critical success factors of ERP implementation and their impact on performance at CBE"

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DECLARATION

I Shewit Eyob declare that this paper is a result of my independent research work on the topic entitled ***"critical success factors of ERP implementation and their impact on organizational performance at CBE"*** in partial fulfillment of the requirements for the degree of masters of Arts in logistics and supply chain management at Addis Ababa University School of commerce. This work has not been submitted for a degree to any other university or it hasn't been published previously. All the references are also duly acknowledged.

Shewit Eyob

Signature _____

Date _____

CONFIRMATION

This is to certify that **Shewit Eyob** has carried out this research work on the topic entitled "***critical success factors of ERP implementation and their impact on organizational performance at CBE"*** under my supervision. This work is original in nature and has not been presented for a degree or masters in any university and haven't been published previously it can be submitted for the partial fulfillment of the requirements for the award of degree of Masters of Art in Logistics and Supply chain management.

Mengistu Bogale (Dr.)

Signature _____

Date _____

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Acronyms

IS	Information Systems
IT	Information technology
ERP	Enterprise Resource Planning
CSFs	Critical success factors
MRP	Material Requirement Planning
MRP II	Manufacturing Resource planning

Abstract

Enterprise Resource Planning (ERP) systems have changed the way organizations go about the process of providing Information systems and addressing the expected services and goods at the expected time and with little cost. An ERP suite plays a critical role in integrating and automating the business processes in an enterprise. With the objectives of improved business productivity, streamlined business operations, and increased cost savings, organizations worldwide have launched initiatives to integrate ERP systems into their existing business environments. The implementation of this system is a difficult and high cost scheme that places tremendous demands on corporate time and resources. Critical success factors of ERP system implementation are the features, where the ERP system implementation can be measured to its success. This research discusses the critical success factors of ERP implementation and its impact on organizational performance with the aim of assessing the relationship between ERP system implementation and performance. The study had objectives of finding out how organizations gained from the use of ERP, the critical success factors impact on implementation of ERP, the major variations observed in the fundamental objective of implementing ERP and their impact on organizational performance and assess if overall business activity was integrated and successful after implementation of ERP and which of the critical success factors lead to effective implementation of an ERP system which in turn will affect the firm's performance. The research adopted a descriptive and explanatory research design employing the use of mainly questionnaires as the primary data collection tool population and sample size of this study using the census method were 70 officials of CBE. Questionnaires were distributed to 70 officials of the CBE and 60 of them were returned and analyzed. Data collected were analyzed by finding out the mean, maximum, minimum, standard deviation and the correlation between the variables in the findings. The presentation of data was done by use of tables followed by discussion of the results. All this was achieved by the use of Statistical Package for Social Science (SPSS V 20). This study found that factors that were considered critical to successful implementation of ERP were found critical and companies using the software should give emphasis on those factors considered critical to succeed while implementing ERP. Areas like education and training, top management support, considering organizational diversity and fit between organizational culture and ERP are among the factors that need high attention. Increase in overall firm performance is gained due to implementation of ERP and Cost of operations has been reduced, improvement in efficiency of resources has been effected, and reduced cycle time and more accurate and prompt data are found because of implementation of ERP.

Key words: critical success factors, ERP (enterprise resource planning), organizational performance

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

In today's aggressive business environment having an efficient and integrated information system to provide customers with goods and services faster and less expensively than their competitors is a fundamental need. When companies have efficient business processes they can be more competitive in the market place. An ERP system can help integrate a company's operations by acting as a company wide computing environment that includes a database that is shared by all functional areas (Wallace and kremzar, 2001). Enterprise resource planning (ERP) programs are core software used by companies to coordinate information in every area of the business. ERP programs help to manage company wide business process, using a common database and shared management tools.

ERP software supports the efficient operation of business processes by integrating throughout a business tasks related to sales, marketing, manufacturing, logistics, accounting and staffing (Monk and Wagner, 2009). Having an effective planning and control system in an organization improve productivity and performance of distribution while decreasing waiting times. As a result, enterprise resource planning systems are examples of the most strategic tools, which provide robust tools for planning, coordination and control of the processes in the organizations (Ahlawat & Puna, 2011).

According to Alsabawi (2015), the ERP system has been shown to be able to provide significant improvements in efficiency, productivity and service quality. Cost reductions and more effective decision-making, improvement in information flow, rapid generation of financial information, promotion of e-commerce, and assistance in development of new organizational strategies are general benefits of successful ERP implementation.

An ERP suite plays a critical role in integrating and automating the business processes in an enterprise. With the objectives of improved business productivity, streamlined business operations, and increased cost savings, organizations worldwide have launched initiatives to integrate ERP systems into their existing business environments. Moreover, there has been a growing increase in using ERP systems as a business information system platform for large organizations and government corporations (Yick, 2011).

ERP systems implementation in many enterprises in Ethiopia is a recent incidence. However, has helped in exposing the Ethiopian enterprise to the best practices and processes adopted internationally and serve as a catalyst to enhance their productivity and efficiency as well. Increasingly Ethiopian enterprises are witnessing and realizing the tremendous benefits a versatile and powerful ERP system brings to an enterprise and imperative need for them to start their own enterprise automation journey as well with the implementation of a suitable ERP solution in their enterprise too(anonymous).

1.2 Statement of the problem

An enterprise resource planning ERP system is a fully incorporated business management system covering functional areas of an enterprise like logistics, production, finance, accounting and human resources. In other words Enterprise resource planning systems are cross-functional and span the entire enterprise wide (Ahlawat & Punam, 2011).

The implementation of this system is a difficult and high cost scheme that places tremendous demands on corporate time and resources. Implementing or upgrading an enterprise resource planning system such as oracle or SAP is an investment and effort that begins with strategic planning and extends into implementation and well beyond (Monk & Wagner, 2009)**.** To help optimize the return on investment organizations should seek and maintain an ERP environment that integrates and optimizes business process and technology to realize process and control efficiencies, cost reductions and effective compliance management.

The main objective of ERP implementations is to optimize the IT environment supporting the business processes in such a way that the strategic objectives can be achieved in the most optimum way. Accordingly, the focus is aimed at realizing business benefits with the use of an ERP system as a vehicle.

Since ERP is the integrated management of core business processes, often in real time and mediated by software technology and integrates varied organizational systems and facilitates error free transactions and production thereby enhancing the organizations efficiency developing

the ERP to the banking industry has become a common recognition. However, the implementation of ERP in the banking sector has faced many challenges besides the major contribution to the overall performance.

ERP software is complicated and expensive. Unless a company uses it to become more efficient and effective in delivering goods and services to its customers, the ERP system will only be a drain on company resources (Monk and Wagner, 2009).

Due to the capabilities of large ERP system and the essential solutions expected from this system to support the enterprise, its implementation process is complex and risky. It engages a considerable amount of enterprise resources, which are put at risk during implementation. According to Zhang *et al.*(2002) ERP implementation issues have been given much attention since two decades ago due to its low implementation success around the globe. Critical success factors of ERP system implementation are the factors, where the ERP system implementation can be measured to its success (Doom *et al*., 2010).

ERP implementation influences an organization in a number of ways and these changes will be questioned in order to derive CSFs for ERP implementation projects. Identifying the Critical Success Factors (CSFs) as early as possible can provide valuable clues to help project managers improve their chances of success (Alemu *et al.,* 2012).

Therefore it is very essential to identify the critical success factors in implementing ERP systems in an enterprise. As I quote Alsudairi on his journal which gave a brief review on critical success factors of ERP implementation, he listed down some of the reasons why companies did not succeed to implement ERP and faced many challenges such as, complex technology, changes to the existing processes and structures which are harder and take time, a potential for behavioral resistance to change (People do not understand the necessity for the change) (Alsudairi, 2013). Other researchers like Davenport (1998) argue that "ERP is not a project; it is a way of life. ERP system does not change anything, however the organization has to change the way of working".

Although an ERP system is a pure software package, it embodies established ways of doing business. Studies have shown that an ERP system is not just a pure software package to be tailored to an organization but an organizational infrastructure that affects how people work and that it "imposes its own logic on a company's strategy, organization, and culture" (Davenport, 1998).

Successful implementation of the project, user satisfaction and the tangible and intangible benefits of the system are some of the parameters suggested by researchers to see the relation between organizational performance and ERP implementation. On the other hand Executives' inefficiency to implement and support the implementation with clear and useful method to direct will affect the implementation of ERP systems in Ethiopian context. They have no guarantee that the system will likely provide the expected benefits which has led to a major change resistance and related setbacks. (Anonymous) as can be read from recent articles on the area under discussion. In addition, Lack of adequate training, organizational culture and diversity, lack of top management support are some of the problems to be assessed.

Because nature of CSFs vary from organization to organization, industry to industry as well as country to country, it is necessary to carry out a research on critical success components that determine the successful execution of ERP systems and their interaction with performance.

1.3 Research Questions

This research answered the following questions

1. What are the critical success factors of ERP implementation and its impact on organizational performance of CBE?
2. What are the key differences observed in the performance of the bank in fundamental objective of implementing ERP after the implementation of ERP system?
3. What sensible differences were distinguished because of implementation of ERP so that the enterprises overall performance increased?
4. By means of the ERP system is the overall business activity of the bank integrated and successful?

1.4 Research Objectives

1.4.1 General objective

The main objective of this research is to identify the critical success factors of ERP implementation and its association with organizational performance at CBE that has implemented the ERP system at its venture.

1.4.2 Specific objectives

- To look into the critical success factors of ERP implementation and their association with performance at CBE.
- To see the relationship between ERP implementation and organizational performance.
- To assess the successfulness of ERP implementation and relationship with organizational performance.

1.5 Significance of the study

Commercial bank of Ethiopia can specifically benefit from this research as the research focuses on the critical success factors of ERP implementation and its association with performance by indicating major factors that contribute to the successful implementation of ERP and moreover specify directions of awareness of success criteria. As well as companies who are in progress of considering implementation of ERP system can look into this study and gain some insights in which areas to give main concern while implementing the system. In addition, findings of this research can be source of literature for future research works.

1.6 Scope of the study

The study will focus on the critical success factors of ERP implementation and their association with performance on the banking industry specifically CBE from different banks and enterprises in Ethiopia, Addis Ababa.

1.7 Limitation of the study

Even though, there are many enterprises that are using the ERP software system to make efficient uses of their overall business elements, this study was restricted to only the banking industry specifically CBE due to observation of gaps in the field.

1.8 Definition of terms

- **(CSF) Critical success factors** = critical success factors can be viewed as situated exemplars that help extend the boundaries of process improvement and whose effect is much richer if viewed within the context of their importance in each stage of the implementation process.(Somers & Nelson,2001).
- **(ERP) Enterprise resource planning** = the integrated management of core business processes, often in real time mediated by software technology.
- **Oracle**= is a multi modal database management system produced and marketed by oracle corporation. It is a database commonly used for running online transaction processing, data warehousing and mixed database workloads.
- **SAP**= SAP ERP is an enterprise resource planning software developed by the Germany company SAP SE.

1.9 Organization of the study

The study was prepared in five chapters. The first chapter which is the introduction included the background of the study, statement of the problem, research objectives, and research questions, significance of the research, scope and limitation of the study. The second chapter was organized to bring the readers into depth review of related literature in the study area and find potential literature gaps. In the third chapter research methodology was discussed in detail, the data collection methods and data collection analysis techniques. Chapter four is about analyzing the data, discussion and results interpretation. The final chapter includes conclusion and recommendations for future work.

CHAPTER TWO: RELATED LITREATURE REVIEW

2.1 THEORETICAL REVIEW

2.1.1 DEFINITION OF ENTERPRISE RESOURCE PLANNING

In this comprehensive environment where companies are merging for competitive advantage, ERP systems help organizations integrate globally and provide a universal language throughout the organization (yick, 2011). ERP is a comprehensive packaged software solution that delivers total integration of all business processes and functions within an organization (Parr & Shanks, 2006). An ERP system is a complex enterprise information system (EIS) based on the business processes and application integration to automate the flow of material, information, financial resources and other operational activities within an organization using a common database without physical restriction (Kumar, Maheshwari & Kumar, 2002).

Such software applications serve as single source of multiple benefits to the organization, for example data integrity, system control – efficiency; reduce costs; better and faster inventory management; real time operations; integrated information of all parties (other agencies, vendors, clients, employees, agents, distributors etc); integrated operation locally and internationally; process improvement; paperless office environment and much more (Raymond *et al.*, 2005; Jiang, 2005; Yasar, Al- Mudimgh, & Mohamed 2000). Using the software companies can manage a budget, recruit people, distribute payroll, and generate purchase orders and so on using an ERP solutions which can provide a standard, uniform way of performing office functions, can reduce duplication, produce meaningful information and cut administrative costs (BearingPoint, 2004).

Growing out of the manufacturing industry, ERP implies the use of packaged software somewhat than proprietary software written by or for one customer (Han *et al.*2005).ERP is a standardized software application system which users can buy off-the-shelf rather than developing a complex software solution from the beginning. ERP system is a broad package of software solutions that seek to integrate the complete range of business's processes and functions in order to present a holistic view of the business from single information and IT architecture (Gable, 1998).

According to Weise and Roseman, Enterprise Resource Planning (ERP) software (synonyms are enterprise systems, integrated vendor software, integrated standard software packages, enterprise business/wide systems, and enterprise application systems) can be defined as customizable, standard application software which include integrated business solutions for the core processes (e. g. production planning and control, warehouse management) and the main administrative functions (e. g. accounting, human resource management) of an enterprise. ERP systems are standard application programs, which support execution of business processes.

The importance of ERP systems in practice is rapidly increasing. In every branch of industry there are many companies in a process of implementing these systems. This shows that it is possible to develop standard functionality, which can be applied in different companies and in different branches of industry. The rapid increase in functionality is not the only reason for the success of ERP- systems in general or for some ERP-systems in particular. New technologies play a role which is just as important. For example, the emerging ROBMS (relational database management systems) in the eighties represents such new technology. According to (Han *et al.,* 2005) ERP enables decision-makers to have an enterprise-wide view of the information they need in a timely, reliable and consistent fashion.

To understand ERP in an uncomplicated way we can refer to a good example described by (Han *et al*., 2005), according to their study there are two flows across supply chain, one is product flow, and the other is information flow. In the past, information system tended to be islands, depending on their functions within the company. For instance, when orders came from customers, they were processed and recorded by sales department, and then the sales transferred the information to manufacturing. After the production made the master schedule, the logistics knew the distribution requirements and then planned the delivery. Finally, the accounting was able to bill to customers. Under this business process, a lot of problems might occur, like delay, lost order, input errors and long lead time, which is illustrated by the following chart:

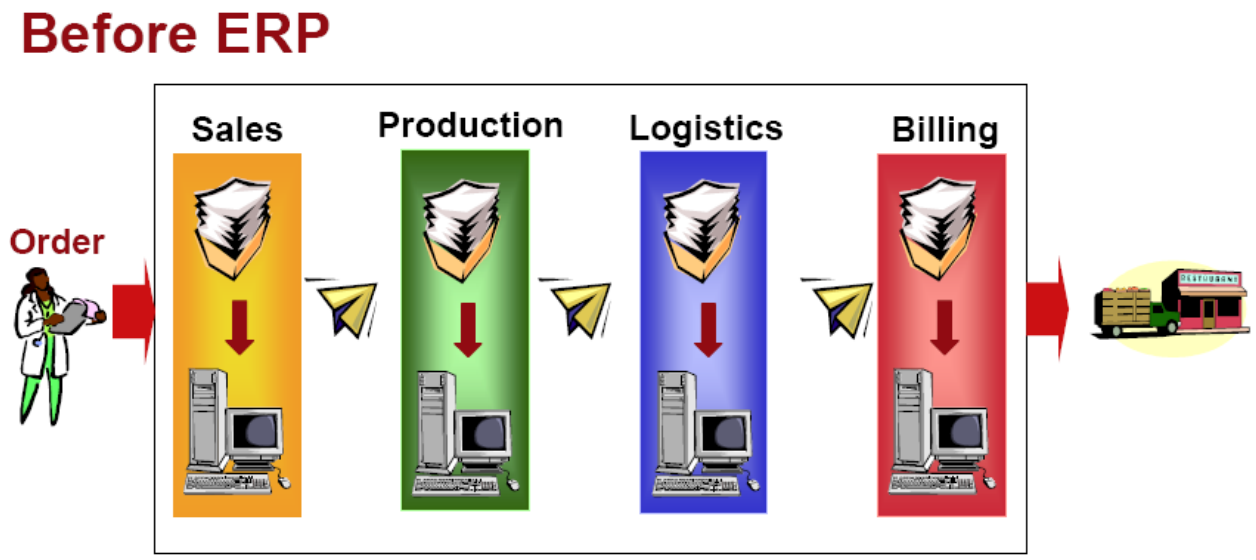

Figure2.1 Order fulfillment before ERP (source: Han *et al*., 2005)

If at all possible, everyone should have access to the same real time data through some interface when they are needed to, which requires a single-point-of-contact system. That is one of the original ideas of ERP. Based on the identical system and database, the information flow and product flow can be processed efficiently.

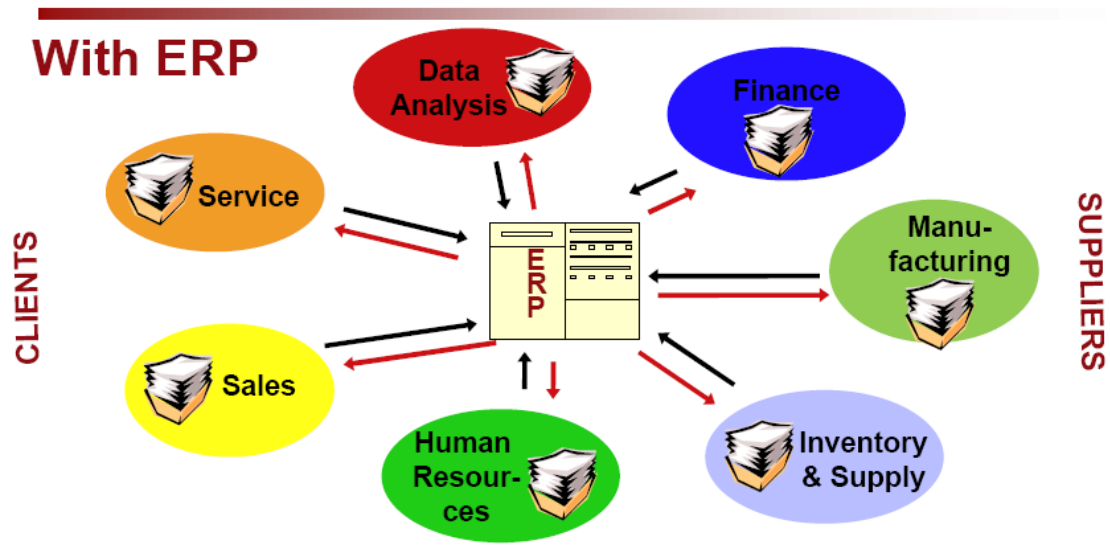

Figure 2.2 Order fulfillment after ERP (source: Han *et al.*, 2005)

2.1.2 DEVELOPMENT OF ENTERPRISE RESOURCE PLANNING (ERP)

Enterprise resource planning (ERP) has advanced as a strategic tool, which is a result of over four decades. This is because of continuous improvements done to the then available techniques to manage business more efficiently and also with developments and inventions in information technology field.

Prior to 1960s businesses generally relied on traditional ways of managing inventories to ensure smooth functioning of the organizations. These theories are popularly known as 'Classical Inventory Management or Scientific Inventory Control Methods'. Most popularly used among them were Economic Order Quantity (EOQ); Bill of Material (BOM) etc. However these systems had very limited scope.

ERP system has evolved from the Material Planning System of 1980's. There are various phases through which this evolution process has gone through. The various phases of development of resource planning system in relation to time and evolution of concept of ERP can be summarized as follows in this section.

2.1.2.1 Material Requirement Planning (MRP)

MRP was the fundamental concept of production management and control in the mid-1970s and considered as the first stage in evolution of ERP. Assembly operations involving thousands of parts such as automobile manufacture led to large inventories.

The need to bring down the large inventory levels associated with these industries led to the early MRP systems that planned the order releases. Such planned order releases ensured proper time phrasing and accurate planning of the sub-assembly items, taking into account complex sub-assembly to assembly relationships characterized by the Bill of Materials.

Using the processing power of computers, databases to store lead-times and order quantities and algorithms to implement Bill-of-Material (BOM) explosion, MRP systems brought considerable order into the chaotic process of material planning in a discrete manufacturing operation. Essentially MRP addresses a single task in manufacturing alone. Material requirement planning (MRP) system was adopted by firms for creation and maintenance of master data and bill of material across all products and part within an organization. MRP on the other hand was an

outgrowth of bill of material (BOM) processing, which is purchase order management that utilizes parts list management and parts development. (Sadagopan, 1999).

2.1.2.2 Manufacturing Resources Planning II (MRP- II)

A natural evolution from the first generation MRP systems was the manufacturing planning systems MRP II that addressed the entire manufacturing function and not just a single task within the manufacturing function. MRP II went beyond computations of the materials requirement to include loading and scheduling. MRP II systems could determine whether a given schedule of production was feasible, not merely from material availability but also from other resource point of view. Typically, the resources considered from MRP II systems would include production facilities, machine capacities and precedence sequences.

The increased functionality enabled MRP II systems provided a way to run the system in a loop. First it was used to check the feasibility of a production schedule taking into account the constraints; second to adjust the loading of the resources, if possible, to meet the production schedules; third to plan the materials using the traditional MRP II systems. Both MRP system and MRP II systems were fairly successful in industry. Due to the power of information systems-databases, algorithms and their integration, organizations did find real support for efficiently managing the manufacturing function in the eighties. (Sadagopan, 1999)

2.1.2.3 Enterprise Resource Planning (ERP)

In the nineties unprecedented global competition, customer focus and shortened product life cycles aroused. To respond to these demands corporations had to move towards agile (quick moving) manufacturing of products, continuous improvements of process and business process reengineering. This called for integration of manufacturing with other functional areas including accounting, marketing, finance and human resource development. Activity-based costing would not be possible without the integration of manufacturing and accounting. Mass customization of manufacturing needed integration of marketing and manufacturing. Flexible manufacturing with people empowerment necessitated integration of manufacturing with the HRD function.

In a sense the 1990s truly called integration of all the functions of management. ERP systems are such integrated information systems build to meet the information and decision needs of an enterprise spanning all the functions of management (Sadagopan, 1999).

2.1.2.4 Extended ERP (E-ERP)

Further developments in the enterprise resource planning system concept have led to evolution of extended ERP (E- ERP) or web - enabled ERP. With globalization on one hand and massive development in the internet technology on the other, need for web based IT solution was felt. Thus E- ERP is development in the field of ERP which involves the technology of Internet and World Wide Web (WWW) to facilitate the functions of an organization around the web.

2.1.2.5 Enterprise Resource Planning II (ERP- II)

ERP II is the advanced step of E-ERP. It is the software package which has strengthened the original ERP package by included capabilities like customer relationship management, knowledge management, workflow management and human resource management. It is a web friendly application and thus addresses the issue of multiple office locations. It is capable of delivering information in an instant to people who need it, no matter wherever they are.

Figure 2.3 Stages of ERP Evolution. Source (Sadagopan, 1999)

2.1.3 Implementation of ERP

ERP implementation refers to the stage of system planning, configuring, testing and final implementation. Use of ERP means ERP execution or utilization. It refers to the experience of managing the operation of the system software in throughout the system life in the post-implementation stages (Nah et al., 2001).

As indicated by a recent study in Kenyan commercial banks the Implementation of an ERP system often constitutes a company's largest IS investment and in many cases the largest corporate project. This is more so in developing countries where many of the operational, control

and managerial systems have yet to be automated and where legacy systems are not as well-established as in the businesses in the developed countries (Nijhia 2014). It is then for this reason that many researchers have concluded by stating that, in developing countries, ERP systems are often implemented not to replace legacy systems but as part of an organizations effort to modernize and differentiate itself (Reimers 2003).

One of the primary benefits of deploying a Full-Function ERP solution is the consolidation of often-dispersed data. The consolidation of data resulting from ERP use creates many organizational benefits that include: No need to synchronize changes between systems; Consolidates applications and brings more control to cross-functional processes for manufacturing, finance, human resources, marketing, and sales; Provides a real-time, enterprise-wide view of the business for faster and more effective decision-making; Shortens production lead times and delivery times; Helps build a common vision throughout the enterprise; Consolidates multiple permissions and security procedures into a single framework, which reduces the risk of losing or exposing sensitive data (Nijhia 2014).

With the organizational impacts of enterprise resource planning (ERP) systems being widely recognized, an increasing number of organizations in various industrial and service sectors and of different sizes in the world have deployed these systems. Vendors and system consultants often claim that the "best business practices" are summed up in ERP system packages.
Unfortunately, ERP adopting organizations have reported both favorable and unfavorable outcomes (Davenport, 1998; Stedman, 1999). Expectations for improved business performance after adoption may result from both operational and strategic benefits.
In reality, many organizations have experienced enormous challenges after implementation, and some suffered greatly from disastrous ERP projects (Spitze, 2001). Such difficulty appears to be related to misfits in business processes and poorly managed organizational variables.

2.1.4 DIMENSIONS OF CRITICAL SUCCESS FACTORS

The few key areas of activity in which favorable results are enormously necessary for particular organization to reach its goal are termed as critical success factors according to Bullen and Rockart (1981). Successful managers must focus their scarcest resource and their time, on

possessions that make a difference between success and failure (Bradley, Joseph, 2008, 178). The CSFs of ERP are those conditions that must be met in order for the implementation process to occur successfully (S. Finney, and M. Corbett, 2007, 334). Critical success factors can be considered as circumstances that are believed to increase the implementation of a project (Arvidisson &kojick 2017).

Although the model of CSF has been studied in a broad range of contexts, it appears that the role of CSFs in project success and performance outcome has attracted little specific attention. From point of view of organizational performance a factor can only be termed a CSF if attending to this factor in a satisfactory manner results in performance improvements.

Therefore, merely identifying a possibly important factor is not sufficient to constitute a CSF. The problem of establishing whether a CSF is really critical is further compounded by the multidimensional contexts in which 'success' and 'performance' may be measured, such as by user satisfaction or successful completion of a project, or through the tangible and intangible benefits to an organization. However, only a few studies have attempted to explore the effect of proposed CSFs on implementation success and/or organizational performance improvements. (Hassan *et al.,* 2018).

Identifying and understanding existing factors and how they influence the project outcome can help organizations to mitigate or prevent the risk of failure (Huang, Chang, Li & Lin, 2012). ERP implementation success repeatedly is an outcome of a number of factors which can be summarized shortly in the following four groups which are, top management support, effective project management, adequate education and training, and organizational culture/diversity.

2.1.4.1 Top management support

Top management commitment and support is the number one CSF considered the most relevant and critical by many researchers is. This concept is referred to the need of having committed leadership at the top management level (Finney & Corbert, 2007). As indicated by many researchers Successful ERP implementation very much depends upon active and persistent top management involvement, and the importance of top management support in each step in all

company levels is crucial (Zabjek et al., 2009; Sarker & Lee, 2003; Nah et al., 2003). Harrison (2004) argues that handing over ERP implementation to technical departments is a fundamental mistake which leads to a failing project.

The use and success of IT in organizations should include participation from the top management, as that reflects that the top management works actively together with the rest of the company towards a successful IT-implementation (Byrd & Davidson, 2003; Nah et al., 2003). Motwani *et al.,(*2002) conclude that not only should the top management be active in the implementation process, but to ensure progress and ultimately success. Top management should also anticipate glitches that might occur; this naturally puts a great demand on their knowledge regarding ERP systems and the implementation process (Motwani et al., 2002).

This is what Yusuf, Gunasekaran and Abthorpe (2004) stress in their contribution; they argue that the commitment has to be solidified by a knowledge base, not only built on strategic planning and leadership but also of technical expertise. This knowledge can express itself in understanding the importance of delegating enough resources to the project in order for it to be successful (Nah et al., 2003).

2.1.4.2 Effective Project Management

One of the vital parts of ERP implementation is a good project management Nah *et al.*, (2001). The project management activities span the first four stages of the ERP life cycle from beginning the project until conclusion (Somers & Nelson, 2001; 2004).

The approach to project management suggests that the project planning and control is in correlation with the project's characteristics such as project size, experiences with technology and project structure (Somers & Nelson, 2004; Holland & Light, 1999).Responsibility should be passed on to an individual or group of employees to coerce success in the project management (Nah et al., 2001). When the project team is formally established, the team must subsequently be defined in terms of its milestones (Holland & Light, 1999).

Determining the critical paths of the project, deciding on the timeliness of the project and managing the force of timely decision making are some of the paths the project team should follow (Nah et al., 2001). Hence, the scope should be established, clearly defined and be limited.

A project team should always bear in mind that a project scope that is too broad or ambitious can cause problems (Somers & Nelson, 2001) and hence take cautions while managing project like ERP which are enormous and complex.

2.1.4.3 Training and Education

One of the key variables when planning for a new system is to plan for education and training programs, which in conjunction with other variables are important ingredients to a successful implementation (Mabert *et al.*2003).

Lack of user training and misunderstanding the enterprise applications appear to be two large reasons responsible for many ERP implementation failures. ERP implementations require a vast amount of knowledge to enable people to solve problems that may occur within the framework of the system. Umble *et al.* (2003) argue that if the employees do not understand how the system works, they will invent their own processes, by selecting parts of the system that they can manipulate.

To make system user training successful, the training should preferably start well before the implementation process begins (Umble *et al.*2003). Executives often fail to appreciate the level of education and training necessary to implement an ERP system and the additional costs, thus, as already mentioned, top management involvement is of high priority (Zabjek *et al.,* 2009; Sarker & Lee, 2003; Nah *et al.*, 2003; Mabert et al., 2003; Umble et al., 2003).

As Cobert and Finney (2007) argue, in order to build user acceptance with regards to the project and nurture a positive employee attitude, training and education can be used as a tool to achieve those goals. Nah *et al.*(2007) continues this argument and necessitate that education should be a priority from the beginning of the project, and both money and time should be spent on various forms of education and training. All too often employees are expected to be able to effectively run and use the new system based only on the education. However, Umble *et al.* (2003) stress the importance that much of the learning process comes from hands-on use under common operating conditions.

2.1.4.4 Organizational culture

Change management is one of the crucial factors to consider while implementing an ERP system into any business. ERP systems bring new methods, processes and procedures, and easing employees into this new system or transition is essential.

When implementing ERP, one is changing the way people work and one of the greatest challenges an organization can face is migrating from a culture of disconnected storage of information, where the reality is one of using multiple, disparate systems, to a fully integrated enterprise wide solution platform with ERP as its foundation. Company management, in cohesion with the software supplier, must make a priority of educating users of the new system so that they gain a firm understanding of the impact their contributions make to the successful deployment and utilization of the new system. If there is not a total "buy-in" of the new solution by each and every employee, the organization cannot leverage the levels of efficiencies and accomplishments promised by the ERP software. If implemented and introduced properly, ERP can be an attractive recitation of the next chapter in company's culture and progress (Benadretti, 2016).

2.2 EMPIRICAL REVIEW

2.2.1 Interaction of ERP systems and firm performance

The impact of ERP system use and overall firm performance was provided by Markus et al., (2000) which compare return on assets, return on investments and asset turnover for ERP users and non-users. Even though, it did not indicate a performance improvement for ERP system users it was found that the financial performance of users has not declined during their test period, whilst the performance of non-users has declined during the same period. (Ahlawat & Punam, 2011)

In this section of the study the researcher will empirically explore the relationships between organizational use of ERP applications and its relation with performance from different articles and findings of other researchers.

The association between IT and the performance of an organization has been one of the major topic that concerned researchers for quite a long time. According to Pavlou *et al*. (2005) earlier

studies did not conclusively show the positive impacts of IT investments on either firm or process performance. There are number of researchers that believe in the positive relationship of IT and business performance, however there are others arguing that investments in IT (or ERP specifically) do not contribute to improved financial performance.

One could hypothesize, as Elragal and Al-Serafi (2011) do, that "there is a mixed result when analyzing the effect of IT on business performance". Although according to the theory, IT investments are supposed to enhance productivity, first empirical research on the field (between 1980 and 1990) showed that there were no additional productivity gains, for those companies that invested in IT. The phenomenon is called 'productivity paradox'. However, recent research findings indicate that IT actually can lead to productivity improvements (Sudzina et al., 2011; Maroofi *et al*., 2011).

Researchers tried to find the root of this problem and identify possible factors, which can lead to a positive relationship between IT and business performance. Such factors were found to be organizational change, innovation and increased employee skills (Pilat, 2004), spurious measurements of output to measure productivity, measurements done before the long payoff time until when returns on IT investments accrue, economy-wide measurements errors due to rearrangements of output, and mismanagement (Hamilton and Asundi, 2008) are possible factors for a negative relationship. Some other factors that can influence the financial performance of adopters are competitive intensity, industry heterogeneity, demand uncertainty, and adoption rate of competitor firms.

On the other hand, the results of Hitt *et al*. (2002) were capable of showing that during an ERP implementation, the financial performance of a firm increases. According to Madapusi and D'Souza (2012), the more ERP modules implemented by a firm, the more strengthened its performance will be.

Empirical investigation by Velcu(2005) shows that successful ERP adopters have a higher financial performance comparing to the less successful ERP adopters. The idea was that a less successful adoption can prevent the efficiency of assets utilization and business processes. In

order to measure the financial performance, indicators like: ROA, ROI, profit margin, assets turnover, capital turnover, and the ratio wages / total costs were used. The findings showed no significant difference in the financial performance change after implementation between the two groups of firms as far as ROA and ROI are concerned. However, successful ERP adopters seem to have better efficiency benefits than the less successful ERP adopters, in terms of Assets turnover and Capital turnover, during the first two years of the ERPs implementation.

Another study that examines the effect of ERP implementation on firm performance is that of Hunton et al. (2002). At this stage, researchers proved that firm which had implemented ERP systems had better performance than those which had not.

What should be highlighted is that, the difference in firm performance between adopters and non-adopters is due to the fact that the performance of the former remained fixed and the performance of the latter reduced. It seems that the adoption of IT can or cannot enhance performance but in each case "the performance of non-adopters would be expected to deteriorate by comparison in a competitive marketplace" (Hunton et al., 2003). As a result, as Hunton et al. (2003) concluded with, we should not necessarily expect to prove pre- to post-adoption financial gains for firms that have implemented ERP systems.

2.3 Summary of literature review

Financial ERP systems are doubtlessly the most important and most widely used ERP systems for firm performance, and they can also provide some valuable insights into business process performance (Dehning and Richardson, 2002; Matolcsy et al., 2005). These insights are, however, limited, especially if only publicly available data like annual reports and the like are used. These highly aggregated data can only be used for a very general analysis of core processes in the value chain, e.g. the ability to turn over inventory quickly, but do not provide deeper insights into performance at the business process level (Kaplan and Norton, 1992). A thorough look into Suitable researches was done by the researcher to summarize the views of different examiners.

A comparison of the various articles shows that different researchers studied different characteristics of the subject matter in different context. One of the major gaps observed from

other studies was that of Shehul *et al.,* (2018) a recent study which articulated on the review of critical success factors of ERP implementation. According to shehul *et al.,* (2018) their sample failed to include studies from Africa, from their systematic review of the different selected articles, they concluded that only one literature was found that was done in Africa which makes their study debatable as there are more than one literatures made in the study area in different parts of the continent including Ethiopia.

Drearily, there is no agreement in the extant literature with regards to which indicators measure overall firm performance or business process performance best in the context of ERP system evaluation. There are even substantially different views as to whether certain indicators measure firm performance or business process performance.

As a summary based on few researches that have described and verified the relationships between organizational performance and its antecedents for CSF the following summary table can be shown by taking the most relevant relationship developed by different researchers to measure the CSFs of ERP implementation and their association with organizational performance at CBE. Identifying CSF for ERP implementation to give impact on organizational performance is a critical issue to be discussed in increasing the organizational performance.

2.4 Conceptual Framework

From the sources of the literature reviewed systematically the conceptual framework for this study is can be,

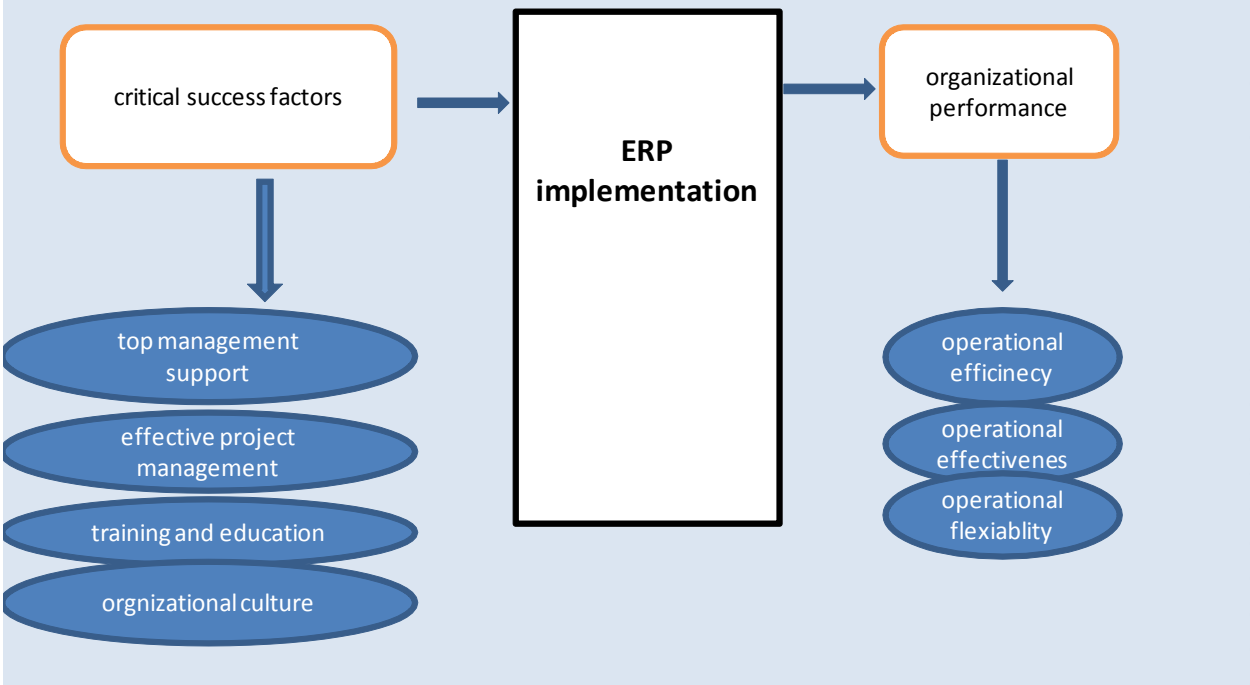

Figure 2.4; conceptual framework build from reviewed literatures.

Source; adopted from reviewed literatures.

Being the organizational performance a dependent variable the study will try to see how each independent variables listed under (CSFS) of ERP implementation will affect the organizational performance from the point of view of user involvement, participation and support system integration and charismatic leadership fit between ERP and organization and also user satisfaction through the tangible and intangible benefits to an organization

Identified as a CSF to ERP implementation stage	References of studies that have identified the CSF	The studies given below found a positive relationship between the CSF and the implementation success / Performance Implementation success / Performance was measured in the studies given
• Project management and evaluation • Project management capabilities.	• Dezdar and Sulaiman -2009 • Finney and Corbett (2007) • Snider et al. (2009) • Somers and Nelson (2004) • Motwani et al. (2002)	• A success index (El Sawah et al., 2008) • implementation quality,which in turn impacts post implementation success measured by operational and managerial benefit
• Training employees • User training and education • Job redesign	• Dezdar and Sulaiman-2009 • Finney and Corbett (2007) • Snider et al. (2009) • Vathanophas (2007) • Bradford and Florin, 2003 • Bradley, 2008	• User satisfaction and ERP benefits • A three-item measure assessing completion on time,
• System integration • User involvement • Participation and support	• Al-Mashari et al. (2003) • Bingi et al. (1999) • Dezdar and Sulaiman -2009 • Wang et al. (2008)	• Impact on decision making and control, efficiency and
• Sustained (top) management support / commitment	• Dezdar and Sulaiman -2009 • Finney and Corbett -2007 • Nah and Delgado (2006) • Snider et al. (2009) • El Sawah et al. (2008) • Petroni (2002)	• Benefits achieved in improved customer satisfaction,planning and inventory management, improved efficiency, know-how and competence, • A success index
• Charismatic leadership fit between ERP and organization	• Wang et al. (2005) • El Sawah et al. (2008) • Hong and Kim (2002)	• perceived deviation from the expected project goals i.e.,cost, time, performance, benefits

Table 2.1 summary of Literature Review

The above summarizes the findings on the relationship between CSFs and implementation success and/or performance outputs of ERP. It additionally includes indications of the way that implementation success has been measured in the literature and has therefore leaded to the approach followed in this study.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

In this section, the research design, research approach, population and sample size, data sources and types, data analysis, ethical considerations and validity and reliability issues are discussed.

3.2 Research Design

Research design is the plan and structure of investigation considered to obtain answer to research questions. The design provides answers about the techniques to be used to gather data and kinds of sampling (Cooper &Schindler, 2003). There are different ways to carry out the quantitative research and hence among them explanatory type of research design will be appropriate to conduct this research. The design is said to be acceptable to carry out this research given that the research is intended to see association of critical success factors of ERP implementation and firm performance. Being the quantitative research applied the survey research method will be pursued since it provides a quantitative or numeric description of trends, attitudes or opinions of a population by studying a sample of that population.

3.3 Research Approach

Based on the nature of the study to be carried out and the problem to be addressed, in this research the researcher used the quantitative type of research approach for testing theories by examining the relationship among variables, which the variables in turn can be measured typically on instruments, so that numbered data can be analyzed using statistical procedures (Creswell, 2008). Assumptions and assessments were tested deductively from the broad to the specific to generalize and replicate the findings.

3.4 Population and Sample size

A research population is generally a large collection of individuals or objects that is the main focus of a scientific query. It is for the benefit of the population that researches are done. However, due to the large sizes of populations, researchers often cannot test every individual in the population because it is too expensive and time-consuming. This is the reason why researchers rely on sampling techniques. Hence, to save time and money while collecting data purposive sampling technique was carried out. The study population used census method and 70 officials of CBE who have clear knowledge about the success factors and general

implementation of the ERP system were included in the study as the objective is focused in finding out the critical success factors of ERP implementation and its impact on performance at Commercial Bank of Ethiopia.

3.5 Data Sources and Types

There are two ways of data sources, primary and secondary. Using the primary data collection technique the researcher prepared a relevant questionnaire to address the major questions under investigation. Questionnaire was distributed to the selected targets of the organization. secondary Sources such as different journals, published and unpublished articles and web searches were done to gather different information.

3.6 Data Analysis

The next step after collection of data from different sources was to analyze the data collected. Data collected from different sources was analyzed using the available statistical package for social sciences (SPSS). In order to answer research questions both descriptive and inferential statistics will be used. Descriptive Statistical methods like frequency, percentage standard deviation, mean tables will be used in order to illustrate the gathered data. Statistical method of multiple regression analysis and Pearson correlation was made to see the relation between ERP and performance and that of CSFS.

3.7 Ethical considerations

The researcher ensured the integrity and quality of the research as much as possible and also respected the confidentiality and anonymity of the selected respondents and make sure that the respondents participated voluntarily. Most importantly the researcher ensured that the research being carried out is an independent research and only assessed relevant components for the research.

3.8 Reliability and validity Issues

Reliability

The cronbach's alpha coefficient which demonstrates the tests and scales that have been constructed or adopted for research projects are fit for purpose and used as a measure of reliability/internal consistency. To make the study more acceptable both reliability and validity has been confirmed. Even though, the cronbach's alpha coefficient is considered good by most

researchers if it has a value of more than 0.7, some authors argue that a scale of 0.6-0.7 is also acceptable. The cronbach's alpha coefficient for the first 11 items is 0.727 which is greater than 0.7 and this indicates that the items from the scale have internal consistency. Or the data under this item is consistent and reliable. The cronbach's alpha for the second part of the questionnaire ERP implementation analysis shows 0.66 and can be considered acceptable. The cronbach's alpha for the last section shows that a 0.633 which shows that the internal consistency and the reliability of this section is in the acceptable region.

Table 3.1 reliability statistics- Cronbach's Alpha Based on Standardized Items

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.727	.744	11
.657	.655	10
.633	.634	7

Source: (survey, 2019)

Validity of findings of this research

In order to keep this thesis valid different literature were deeply reviewed to understand critical success factors of ERP implementation and its association with performance. The questionnaires constructed were evaluated and approved to be consistent with the objective of the study by my advisor. In addition to this questionnaires were adopted from different previous researches made on the title with quite similar issues to be addressed. Most of the respondents of the questionnaire have deep understanding on ERP as their day to day activity is connected with the system.

CHAPTER FOUR: DATA ANALYSIS

4.1 INTRODUCTION

The data analysis and interpretation of the results are briefly discussed under this chapter as follows. The data was collected using likert scale questionnaire. And out of 70 questionnaires distributed to all target population 60 questionnaires were returned and analyzed.

4.2 Demographic Information of Respondents

Information like gender, age, educational background, and year of service of the respondents is the first part of the questionnaire and are shown in the following tables in ascending order as it appears on the questionnaire.

4.2.1 Gender of Respondents

According to the data collected male respondents were higher than female respondents which get hold of 70% of total respondents while female respondents attain the rest 30 % of the total.

Table 4.2.1 gender of Respondents

GENDER

		Frequency	Percent
Valid	MALE	42	70.0
	FEMALE	18	30.0
	Total	60	100.0

Source: (survey, 2019)

4.2.2 Age of respondents

As indicated in the table below of the total respondents the 66.7% of the respondent lay in the age category between 22- 30. 23.3% of them are in the age between 31- 40. The rest which holds the least percent which is 10% is the age group found between 41- 50. From the survey, we can see that majority of the respondents are young adults.

Table 4.2.2 Age of Respondents

AGE

		Frequency	Percent
Valid	22-30	40	66.7
	31-40	14	23.3
	41-50	6	10.0
	Total	60	100.0

Source: (survey, 2019)

4.2.3 Educational background

As can be seen from the data below, 53.3 % of the responds are holders of BA/BSC and the rest 45 % have a masters degree only one respondent was found to have a college degree which is 1% showing that majority of the respondents are educated enough to give reliable information on the subject matter under investigation.

Table 4.2.3 Educational background

EDUCATIONAL BACKGROUND

		Frequency	Percent
Valid	COLLEGE DIPLOMA	1	1.7
	BA/BSC	32	53.3
	MASTERS	27	45.0
	Total	60	100.0

Source: (survey, 2019)

4.2.4 Year of service

Most of the respondents of this category have a service year of 1-5 which comprises the 45% of the total respondents. The second category accounts for 43.3% which ranges from 6-10 years of service at the company. The rest of the respondents have stayed in the company longer than the above two which is in the range of 11-15 years and holds 11.7% from the total. We can understand from the survey that since implementation of the system software is a recent phenomenon, employees who joined the company the last five years know more about the system and catch up easily than those who stayed for longer period.

Table 4.2.4 year of service

YEAR OF SERVICE

		Frequency	Percent
Valid	1-5 YEARS	27	45.0
	6-10 YEARS	26	43.3
	11-15 YEARS	7	11.7
	Total	60	100.0

Source: (survey, 2019)

4.3 Descriptive statistics

4.3.1 Descriptive Analysis of critical success factors

The reliability of a scale is the degree to which research method produces stable and consistent results and indicates how free it is from random error. A specific measure is considered to be reliable if its application on the same object of measurement number of times produces the same results. Internal consistency is the degree to which the items that make up the scale are all measuring the same underlying attribute.

The rule of thumb pertaining to the intervals for breaking the range in measuring variables that are captured with five point scale(that ranges from strongly disagree to strongly agree) is 0.8, which is actually found by dividing the difference between the maximum and minimum scores to the maximum score.The below is the calculated composite value from1-5.

From 1-1.8=SD, 1.81-2.6=D, 2.61-3.4=Neutral, 3.41-4.2=Agree, 4.21-5.00=SA.

The table below briefly describes all the critical success factors under study, tests the reliability and checks the internal consistency among the CSFs. The questions under this section were answered by all 60 respondents.

The mean ranges from 3.07 to 4.47 indicating that respondent's responses under this section have mostly agreed to the statements of the questionnaire. We can say that from the above 11 factors most of them are considered as critical success factors of ERP implementation. Only four items under this section fall to the category neutral showing that the respondents' responses to top

management support, providing commitment, supporting the implementation team and persistent management support have been considered insignificant by the top management.

Table 4.3.1 descriptive statistics - Critical Success factors

	N	Mean	Std. Deviation
There is top management support and acceptance regarding technological acceptance	60	3.07	1.494
Top management provide commitment and full support for ERP implementation	60	3.23	1.454
Top management support the implementation team positively	60	3.18	1.652
There is active and persistent top management support at your organization	60	3.32	1.444
The project implementation was done by responsible project leaders	60	3.83	1.152
There was a formally established project team while undertaking the ERP implementation	60	3.75	1.348
There is sufficient material and adequate training about the ERP system	60	4.27	1.339
There is clear understanding of ERP implementation by the users of the software at your organization	60	4.23	1.407
education and training is prioritized at your organization in order to make users of the system understand it	60	4.45	1.185
ERP implementation has a positive impact on your organizational culture	60	4.47	1.228
ERP is a perfect match for your organizational culture	60	4.45	1.171
Valid N (list wise)	60		

Source: (survey, 2019)

4.3.2 Descriptive Analysis of ERP Implementation

From the table below, we can see the mean value for the variables of ERP implementation for a total of 10 inputs. All of the 60 respondents have responded to the questions under this category and the value of the mean ranges from 3.10-4.43 showing that the variables in this category are considered important and influence the implementation of ERP of a firm. The highest mean is

4.43 which show that the organization performance with ERP is better for the users of the system than non users. And the effect of charismatic leadership effect on ERP implementation has the lowest mean sowing that most of the respondents have a neutral response to this question.

Table 4.3.2 descriptive statistics - ERP implementation

	N	Mean	Std. Deviation
The leaders are charismatic and facilitated the implementation that benefits the organizational style	60	3.10	1.386
compared to other industries in the field your organization has benefited by implementing ERP	60	3.78	1.303
ERP is fully integrated and eases the day to day operations of your organization	60	3.50	1.321
Integration of the ERP system with the organization data has led to a successful organizational outcome	60	3.78	1.236
The organization performance is better with ERP system users than non users4	60	4.43	1.155
The longer the experience with ERP system users, the better the organization performance	60	4.02	1.334
The ERP software has a domino effect on every aspect of the organization	60	3.92	1.319
There is clear guide on ERP implementation resulting better performance at every stage of your organization	60	3.90	1.362
Implementing the ERP has led to greater use of technology and increased bus. performance of workers	60	3.80	1.436
Employees are highly motivated to do their work after implementation of ERP resulting increase in performance	60	3.88	1.367
Valid N (listwise)	60		

Source: (survey, 2019)

4.3.3 Descriptive Analysis of Organizational performance

The last table in this descriptive reliability analysis section is the discussion of the organizational performance. The mean values for the total 7 items in the organizational performance section

range form 3.92- 4.22 which shows that the questions in this section are good indicators of improved performance in the organization. Under this category respondent's response ranges between agree and strongly agree showing that they believed with the help of ERP organizations cost has been reduced, effective utilization has led to reduced cycle time, lesser inputs and more accurate and prompt data due to ERP. Increase in market share for ERP system users has the highest standard deviation with greatest dispersion of all among the 7 items.

Table 4.3.3 descriptive statistics - organizational performance

	N	Mean	Std. Deviation
Due to ERP cost of operations has been reduced	60	3.97	1.327
ERP has enabled effective utilization of resources by reducing cycle time and led to greater use of resources	60	4.08	1.266
There is improvement in efficiency of resource utilization due to ERP	60	3.92	1.331
Planning and control of resources takes lesser inputs (time, cost, effort) due to ERP	60	3.98	1.282
more accurate and prompt data is obtained for decision making from ERP	60	4.10	1.324
usage of ERP has increased employee satisfaction	60	4.22	1.263
ERP has led to greater market share in the industry compared to non users of the system	60	4.00	1.365
Valid N (listwise)	60		

Source: (survey, 2019)

Normality, linearity, Homoscedasticity, Independence of residuals.

These all refer to various aspects of the distribution of scores and the nature of the underlying relationship between the variables. These assumptions can be checked from the residuals scatter plots which are generated as part of the multiple regression procedure. Residuals are the

differences between the obtained and the predicted dependent variable (DV) scores. The residuals scatter plots allow us to check:

• Normality: the residuals should be normally distributed about the predicted DV scores;

• Linearity: the residuals should have a straight-line relationship with predicted DV scores; and

• Homoscedasticity: the variance of the residuals about predicted DV scores should be the same for all predicted scores.

The following two diagrams prove that the multiple linear regression of this study met the assumption described above. The first assumption is that normality and fig 4.1 histogram of standardized residuals examines whether they are normally distributed or not and it shows the residuals are almost normally distributed.

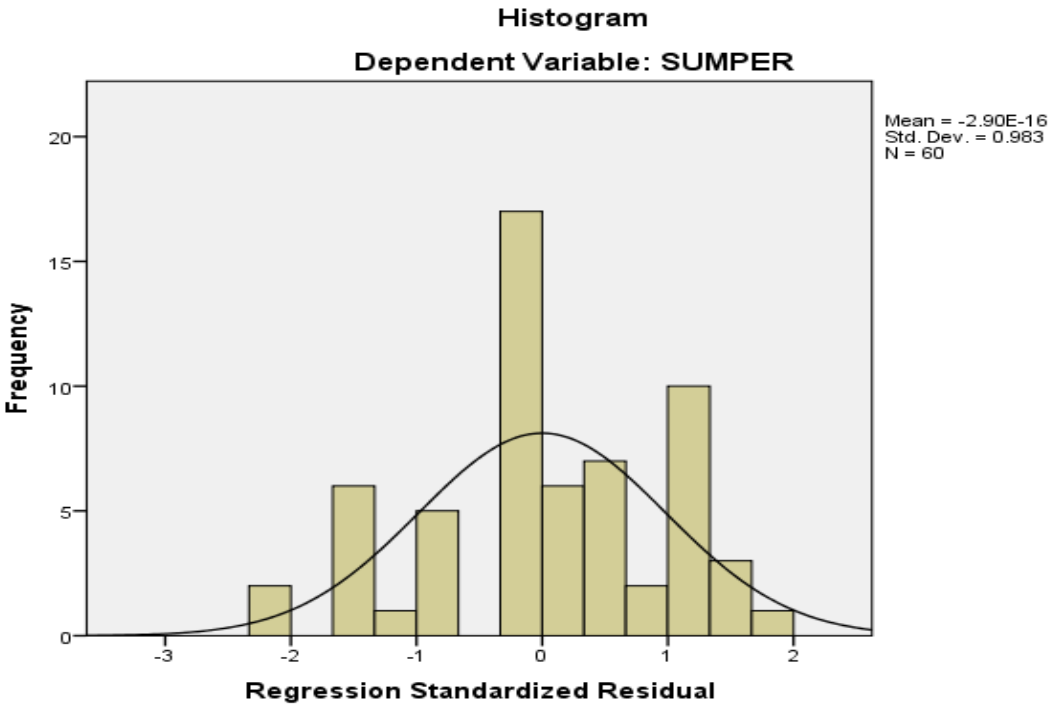

Fig 4.1 histogram of standardized residuals

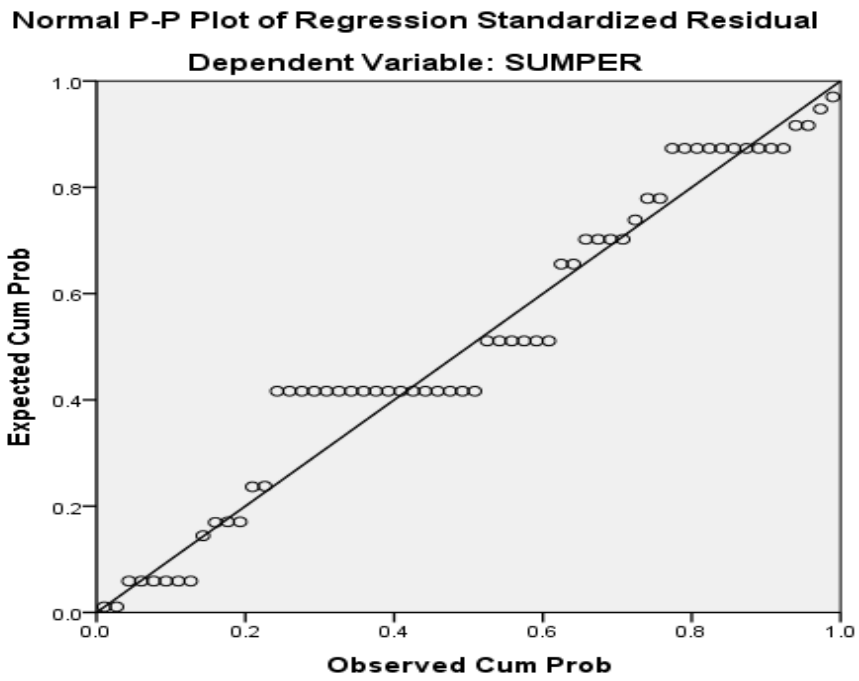

Fig 4.2 Normal p-plot regression standardized residual

As indicated in the above diagram 4.2 the linearity and same variance (homoscedasticity) are met since the scatters do not make any curve and the scatters go along with the line.

Multicollinearity and singularity

The other major concept in multiple regression analysis is that of multicollinearity and singularity. This refers to the relationship among the independent variables. **Multicollinearity** exists when the independent variables are highly correlated. **Singularity** occurs when one independent variable is actually a combination of other independent variables. Multiple regressions disparate multicollinearity or singularity, and these certainly don't contribute to a good regression model. As can be seen in the table below and based on the rule of thumb, a maximum of 15 condition index or more is considered an indication of the interdependence multicollinearity was found to be absent within the independent variables of this study. The value ranges from 12.57-14.6.

Collinearity Diagnostics[a]

Model		Eigen value	Condition Index	Variance Proportions		
				(Constant)	ERP Implementation	Critical Success Factors
1	1	2.967	1.000	.00	.00	.00
	2	.019	12.575	.07	.39	.93
	3	.014	14.600	.93	.61	.07

a. Dependent Variable: Organizational performance

Source: (survey, 2019)

Correlation analysis

The relationship between the variables in the table below shows that there is a positive relationship between the variables. Based on suggestions of (Cohen, 1988) there is a small correlation between critical success factors of ERP implementation and that of organizational performance. But high correlation between implementation of ERP and organizational performance can be observed. There is enough evidence to show that the relation is significant.

Correlations

		ERP Implementation	Organizational Performance
ERP Implementation	Pearson Correlation	1	.490**
	Sig. (2-tailed)		.000
	N	60	60
Organizational Performance	Pearson Correlation	.490**	1
	Sig. (2-tailed)	.000	
	N	60	60

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

Source: (survey, 2019)

4.4 Regression analysis of Critical Success factors and ERP implementation.

Regression analysis is a set of statistical processes for estimating the relationship among variables. It assess whether there is a relationship between dependent variable and independent

variable or not. In order to achieve the desired objective of this study multiple regression analysis was assessed between the dependent variable organizational performance and the independent variables under CSFs of ERP implementation (top management support, effective project management, education and training and organizational culture) and implementation of ERP in an organization (leadership fit between ERP and organization, system integration, user involvement, participation and support). The dependent variable which is organizational performance was measured by overall operational effectiveness, efficiency and flexibility.

$Y=\beta0+\beta1X1+\beta2X2+\alpha$

Where Y is the dependent variable (organizational performance)
β0 is the regression coefficient, β1and β2 are the slopes of the regression equation
X1 is the sum of all variables of CSFs (top management support, effective project management, education and training, and organizational culture) and X2 is the sum of ERP implementation (leadership fit between ERP and organization, system integration, user involvement and participation and support).

By using SPSS version 20 the following results were determined from regression analysis. And as it is indicated on the table below, correlation is 0.507 which shows linear relationship between the dependent and independent variables. The coefficient of determination or adjusted R square value is 0.231 which indicates that only 23 % of the chosen CSFs of ERP implementation contributes to organizational performance.

Table 4.4.1 model summary

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.507[a]	.257	.231	.73930
a. Predictors: (Constant), SUMCSF, SUMERP				
b. Dependent Variable: SUMPER				

Source: (survey, 2019)

The next table shows that the regression analysis was significant at p value 0.000 which is less than 0.05 and the probability that CSFs of ERP and ERP implementation impact on organizational performance explained randomly is very low.

Table 4.4.2 ANOVA MODEL

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.779	2	5.390	9.861	.000[b]
	Residual	31.154	57	.547		
	Total	41.933	59			

a. Dependent Variable: SUMPER

b. Predictors: (Constant), SUMCSF, SUMERP

Source: (survey, 2019)

Table 4.4.3 Regression coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.258	.654		1.925	.059
	SUMERP	.548	.158	.433	3.479	.001
	SUMCSF	.176	.154	.142	1.144	.258

a. Dependent Variable: SUMPER

Source: (survey, 2019)

According to the above table the B value for both CSFs and ERP implementation is positive implying that all the independent variables are positively associated with the dependent variable. In which, a unit increase in one of the sub variables in ERP implementation will result in 0.548 increase in total organizational performance.

CHAPTER FIVE:
CONCLUSION AND RECOMMENDATION

5.1 Summary of major findings

The findings of the data analysis made on SPSS shows that dimensions of critical success factors such as top management support, effective project management, education and training, and organizational culture have little or no impact on organizational performance. On the other hand implementation of ERP measured by leadership fit between organizations, system integration user involvement and participation and support have an impact on organizational performance. With 95% confidence interval with p values greater than 0.05 ERP implementation measures were found have an impact on organizational performance.

Dimensions of critical success factors such as top management support, effective project management education and training and organizational culture have a lion share on implementing a successful ERP system at an organization. But do not directly affect the performance of a firm. Where as a successful implementation of ERP has a direct and also indirect relationship and impact on organizational performance. Charismatic leadership fit, system integration, user involvement and top management participation and support were said to have a positive impact on organizational performance.

As a summary, overall firm performance like operational effectiveness, operational efficiency and flexibility can be increased or decreased by the above success factors and hence ERP implementation of a firm can lead to a success if implemented in such a way that all the above listed variables are processed in strategic way.

5.2 Conclusion

The aggressive marketing environment of today's upbringing forces organizations to give a great importance to customer needs and listen to their voices, and supplier and customer should be closer and closer in order to produce goods or services based on the customer needs. For this reason, companies worldwide have started using ERP system software that integrates the overall functional areas of an organization.

The main objective of the research was to assess the CSFs of ERP implementation and their impact on organizational performance. Using explanatory type of research design quantitative or numeric description of trends were assessed and analyzed by SPSS v20. And multiple regression analysis was used to see the relationship among dependent and independent variables.

As a result we can conclude that factors that were considered critical to successful implementation of ERP were found critical and companies using the software should give emphasis on those factors considered critical to succeed while implementing ERP. Areas like education and training, top management support, considering organizational diversity and fit between organizational culture and ERP are among the factors that need high attention.

We can see from the study above that system throughout the organization is well integrated and overall business activity after implementation of ERP at the organization is increased and facilitated. Hence, increase in overall firm performance is gained. Cost of operations has been reduced, improvement in efficiency of resources has been effected, and reduced cycle time and more accurate and prompt data are found because of implementation of ERP.

As alhawat & Puna,2011 found out, The implementation and the use of an effective planning and control system in an organization improve productivity and performance of distribution while decreasing waiting times. The enterprise resource planning systems are examples of the most strategic tools, which provide robust tools for planning, coordination and control of the processes in the organizations.

ERP includes the management of every operation in a value chain to minimize cost and time. In addition one should note as Melville et al., 2004 that Organizational performance is the aggregation of ERP-enabled process improvements with metrics capturing bottom-line firm impacts.

After reviewing studies on the impact of ERP systems on business performance (Markus et al., 2000), one would expect a wide range of influences from ERP ranging from operational to strategic. Operational efficiency is usually reflected in cost reduction and productivity enhancement whereas strategic success is usually reflected in revenue growth and gains in market share.

It is important to note that changes in organizational resources may not result in immediate success due to adjustment costs, learning and other factors. Benefits of ERP systems require longitudinal review of the organizational performance. Markus et al., (2000) provide evidence on the impact of ERP system use and overall firm performance by comparing return on assets, return on investments and asset turnover for ERP users and non-users. Their key results do not indicate a performance improvement for ERP system users. However, they find that the financial performance of users has not declined during their test period, whilst the performance of non-users has declined during the same period.

5.2 Recommendations

Based on the findings discussed above the following recommendations were suggested

- The company should work more on top management support
- Effective project management, education and training and organizational culture fit between adopters of the system and the organization should be given high attention for implementation of ERP.
- The company should give more emphasis for change management each time something new is introduced that organization and the system will be aligned with the organizational environment.
- The company needs to have a clear guide of the system at every stage of the organization.
- Overall firm performance like material planning, time, cost and effort are reduced with ERP. So it will be better to give adequate training and education for the users so that they understand the ease the technology brought and technologically accept the software.
- ERP increases overall organizational performance and hence it is recommended to update the system and also update employees of the organization.

References

Abera, H., 2013. Financial Performance of the Ethiopian Banking Sector. *International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064.*pp 2743-2747.

Abazi,B., Chaushi, A.,& Dika, Z. 2016. Critical Success Factors in ERP Implementation. *Academic Journal of Business, Administration, Law and Social Sciences IIPCCL Publishing, Tirana-Albania,* ISSN 2410-3918 *Vol. 2 No. 3.* also available at : https://www.researchgate.net/publication/310775844.

Alemu, S., Mesfin, B., & Mesfin, K. 2003. ERP Implementation framework: The case of Ethiopia. *HiLcoE journal of computer Science and Technology*,1(1) pp. 23-30.

Al-Fawaz,k., Al-Salti,z., & Eldabi, T. 2008. Critical success factors in ERP Implementation: A Review. *European and Mediterranean Conference on Information Systems. Dubai.*

Ahlawat, J., & Punam 2011. ERP systems and Business performance .*international economics & finance journal,* Vol. 6, No. 2, July-December pp. 273-286.

Al-sabaawi, M.Y 2015. Critical Success Factors for Enterprise Resource Planning success. *International Journal of Advances in Engineering & Technology*, Vol. 8, Issue 4, pp. 496-506

AlSudairi,M., T 2013. Analysis and exploration of critical success factors of ERP Implementation: A Brief Review. *International Journal of Computer Applications (0975 – 8887) Volume 69– No.8.*

Alwabel, S., Ahmed, A.,& Zairi, M. 2005. The Evolution of ERP and its Relationship with E-Business. Working paper. *Bradford University School of Management.*

Arvidsson, J., & Kojic, D. 2017. MASTER THESIS WITHIN: Business Administration. International Logistics and Supply Chain Management. Jonkoping University.

Beleț, T., & Purcărea, A. 2017. The Evaluation of Enterprise Resource Planning Systems. *International Journal of Advanced Engineering, Management and Science .IJAEMS*. Vol-3, Issue-12, ISSN: 2454-1311 pp. 1091-1095. https://dx.doi.org/10.24001/ijaems.3.12.1.

Byrd, T.A and Davidson, N.W 2003, "Examining possible antecedents of IT impact on the supply chain and its effect on firm performance," *information & management*, Vol.41No.2pp243-255

Davenport, T. H 1998, "Putting the Enterprise into the Enterprise Systems", *Harvard Business Review*, July/August, pp. 121-31.

Dehning, B. and Richardson, D. J. 2002, "Returns of Investments in Information Technology: A Research Synthesis", Journal of Information Systems, Vol. 16, No. 1, pp. 7-30.

Dezdar,S., and Ainin, S. 2012. Investigating the Impact of Organizational Culture on Enterprise Resource Planning Implementation Projects. *World Applied Sciences Journal* © IDOSI Publications, 17 (9): 1125-1133, 2012 ISSN 1818-4952. PP.1125-1133.

Doom, C Milis K, P. S. & B. E. 2011. Critical success factors for ERP implementations in Belgian SMEs. *Journal of Enterprise Information Management*, 23(3), PP 378 – 406.

Elragal, A.A. and Al-Serafi, A.M., 2011. 'The effect of ERP system implementation on business performance: an exploratory case-study', Communications of the IBIMA, 670212, pp.1–19, DOI: 0.5171/2011.670212.

Fang, L., & Patrecia,S., 2005. Critical Success Factors of ERP Implementation. Paper within IT and *Business Renewal. JÖNKÖPING UNIVERSITY*.

Finney, S & Corbes , M 2007, ERP implementation: a compilation and analysis of critical Success factors. *Business Process Management Journal*, *13*(3), 329–347.

Gable, G. 1998, Large package software: A neglected technology. Journal of Global Information Management, 6(3), 3-4.

Han, K., H, & Park, J. W., 2009. Process-centered knowledge model and enterprise ontology for the development of knowledge management system. *Expert Systems with Applications*, *36*, 7441–7447.

Hassanbelnably, H., Vonderembse, A., & Hwang, D, 2011. The Impact of ERP Implementation on organizational capabilities and Firm Performance. Available at *https://www.researchgate.net/publication/228295889*.

Hassan et al., 2018. Critical Success Factors and their influence in ERP implementation success of organizational performance. *Acta Informatica Malaysia (AIM)* 2(1) PP. 12-16.

Hamilton, L. and Asundi, R., 2008. 'Technology Usage and innovation: it's effect on the profitability of SMEs', Management Research News, Vol. 31, No. 11, pp.830–845.

Heaton, D., Rainforth, M., & Mengiste, A., 2013. Analysis of the critical Success Factors for ERP systems Implementation in U.S. Federal offices. Available at https://www.researchgate.net/publication/290678897

Hitt, L M Wu, D J and Zhou, X 2002, 'Investment in enterprise resource planning: business impact and productivity measures', *Journal of Management Information Systems*, Vol. 19, pp.71–98.

Holland. C. P., Light. B., 1999, A Critical Success Factors Model For ERP Implementation, Software IEEE, Journal and magazines, volume 16 Issue 3, pp 30-36

Hunton, J.E, McEwen, R.A, and Wier, B. 2002, "The reaction of financial analysts to enterprise resource planning (ERP) implementation plans", Journal of Information System, Vol. 16 No. 1, pp. 31–40.

Jiang, Y 2005, Critical success factors in ERP implementation in Finland. Swedish School of Economics and Business Administration, Finland, 5 - 6.

Kaplan, R. S. and Norton, D P 1992, The Balanced Scorecard - Measures that Drive Performance. Harvard Business Review, Vol. 70, No.1, pp. 71-79.

Klaus, H., Rosemann, M., and Gable, G., 2000. What is ERP?. *Information Systems Frontiers 2:2*, PP 141-162.

Kumar, V, Maheshwari, B, & Kumar, U 2003,' An Investigation of Critical Management Issues in ERP Implementation': *Empirical Evidence from Canadian Organizations*.

Matolcsy, Z., Booth, P. and Wieder, B. 2005, "The Economic Benefits of Enterprise Resource Planning Systems: Some Empirical Evidence", Journal of Accounting and Finance (forthcoming).

Maroofi, F Sadeghi, F and Mojoodi, A 2011, 'The impact of enterprise systems on corporate performance', *International Journal of Vocational and Technical Education*, Vol. 3, No. 5, pp.61–70.

Monk, E.F. and Wagner, B.J, 2009. Concepts in Enterprise Resource Planning.3rd ed. USA: coursTechnology Cengage Learning.

Motwani, J., Mirchandani, D., Madan, M. and Gunasekaran, A., 2002, "Successful implementation of ERP projects: evidence from two case studies", *International Journal of Production Economics*, Vol. 75 No. 1, pp. 83-96

Mwirigi, F. & Njihia, E., 2014. The Effects of Enterprise Resource Planning Systems on Firm's Performance: A Survey of Commercial Banks in Kenya. *International Journal of Business and Commerce* Vol. 3, No.8: PP [120-129] (ISSN: 2225-2436).

Nah, F.F.-H. and Zuckweiler, K.M., 2003, "ERP implementation: chief information officers perceptions of critical success factors", *International Journal of Human-Computer Interaction*, Vol. 16 No.1,pp. 5-22

O'Leary, D., 2014. ERP systems: Turning promises into Performance. *Master Thesis Project Delft University of Technology Faculty of Technology, Policy and Management.* availaiable at https://www.researchgate.net/publication/227390121

Parr, A & Shanks, G 2000b, A taxonomy of ERP implementation approaches. *Proceedings of the 33rd Hawaii International Conference on System Sciences*. Retrieved Mar 28 2011, from Google Scholar:http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.98.3458&rep=rep1&type=pdf

Pavlou, P.A. et al. 2005, 'Measuring the return on information technology: a knowledge-based approach for revenue allocation at the process and firm level', Journal of the Association for Information Systems, Vol. 6, No. 7, pp.199–226.

Pinckaer,F. S.,Gardner,G. &Vossel,V., 2011. Open ERP: *A modern Approach to Integrated Business Management*.

Pilat, D 2004, 'The economic impacts of ICT – a European perspective', Conference on IT Innovation 2004, Tokyo.

Raymond, L., Uwizeyemungu, S. & Bergeron, F. 2005, ERP Adoption for E- Government : an Analysis of Motivation. eGovernment Workshop '05 (eGOV05), September 13 2005, Brunel University, West London, UK. also available at http://www.iseing.org/egov/eGOV05/Source%20Files/Papers/CameraReady- 4-P.pdf Shanks

Reimers, K 2002, Implementing ERP systems in China, *the 35th Annual Hawaii International Conference on System Sciences.*

Rockart, J & Bullen, C 1981, A primer on critical success factors. Center for Information Systems Research Working Paper No 69. Sloan School of Management, MIT, Cambridge, Massachusetts.

Sadagopan, S 1999, ERP, *A managerial Perspective'*, Tata McGraw-Hill Publishing company Limited.

Sarker, S & Lee, A.S. 2003, "Using a Case Study to Test the Role of Three Key Social Enablers in ERP Implementation". *Information and Management*, 40 (8), pp. 813-829

Shatat,S., Udin, Z., 2015. ERP system issues, challenges and Benefits. Available at https://www.researchgate.net/publication/268299756

Shatat, A., 2015. "Critical Success Factors in Enterprise Resource Planning (ERP) System Implementation: An Exploratory Study in Oman" *The Electronic Journal of Information Systems Evaluation Volume 18 Issue 1*, (pp36-45) available online at www.ejise.com

Somers, T.M. and Nelson K.G. 2004, 'A taxonomy of players and activities across the ERP project life cycle', *Information and Management*, 41(3):257–278.

Spitze, J.M 2001, "Inside a Global System Failure", CIO Magazine, February 1, available at www.cio.com/ archive/020101/passport_worldview.html (accessed April 26, 2004).

Stedman, C., 1999. 'Survey: ERP costs more than measurable ROI', Computerworld, Vol. 33, No. 14, p.6.

Sudzina, F., Pucihar, A. and Lenart, G. 2011, 'A comparative study of the impact of ERP systems implementation on large companies in Slovakia and Slovenia', Enterprise Information Systems Communications in Computer and Information Science, Vol. 219, No. 4, pp.322–330

Wong, B. and Tein, D., 2003. Critical Success Factors for ERP Projects. Online available at https://www.researchgate.net/publication/229022123.

Tsai,H. et al., 2010. Evaluating the Information Systems Success of ERP Implementation in Taiwan's Industries. Available online at https://www.researchgate.net/publication/224096884.

Vatreš, S., 2016. Enterprise resource planning system implementation: critical success factors that affect ERP implementation in Bosnia and Herzegovina. *International Conference on Economic and Social Studies*. PP 155-166.

Velcu, O., 2005. 'Impact of the quality of ERP implementations on business value', *The Electronic Journal Information Systems Evaluation*, Vol. 8, No. 3, pp.229–238.

Voulgaris, F., Lemonakis, C., and Papoutsakis, M., 2015. The impact of ERP systems on firm performance: the case of Greek enterprises.*Global Business and Economics Review, Vol. 17, No. 1*, pp 113-129

Wallace, T.,F & Kermzar, M., H., 2001 .ERP: Making It happen *The Implementers' Guide to Success with Enterprise Resource Planning*. New York: John Wiley & sons, Inc.

Wortmann, J. C., 1998. Evolution of ERP systems. *BETA publicatie: working papers; Vol. 31). Eindhoven: Technische Universiteit Eindhoven, BETA*

Yick, J., 2011. Implementing Vanilla ERP Systems: Factors to Consider in Strategy, Business Alignment, and Customization. *Applied Information Management and the Graduate School of the University of Oregon in partial fulfillment of the requirement for the degree of Master of Science.*

Zabjek, D., Kovacic, A., & Stemberger, M.I., 2009. The influence of business process management and some other CSFs on successful ERP implementation. *Business Process Management Journal, 15(4),* PP.588-608.

Zhang, L., Matthew, K., 2002. Critical Success factors of ERP systems Implementation success in China. *Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS'03) 0-7695-1874-5/03.*

Ziemba,E. and Obłąk ,I., 2013. Critical Success Factors for ERP Systems Implementation in Public Administration. *Interdisciplinary Journal of Information, Knowledge, and Management Volume 8.*

Appendices:

Appendix 1

QUESTIONNAIRE

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTEMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

RESEARCHER: SHEWIT EYOB

Dear Respondents

This research questionnaire is organized to gather information regarding critical success factors of ERP system implementation and their impact on performance in Commercial Bank of Ethiopia for the partial fulfillment of the requirements for Masters of Arts degree in logistics and supply chain management at Addis Ababa University school of Commerce. The aim of this study other than completion of the degree is to analyze critical success factors of the Implementation of ERP and its impact on performance and provide information for other banks and industries that are in the progress of implementing the system. You are kindly asked to provide a reliable information as the result of the research is highly dependent on the accuracy of the information you provide. Your response is highly confidential and is only going to be used for the purpose of this study.

Thank you in Advance.

Part 1. Personal information

Instruction: please make thick mark (√) on the choice of your answer

1. Gender/sex

1. Male ☐ 2. Female ☐

2. Age

1. 22-30 ☐

2. 31-40 ☐

3. 41-50 ☐

4. Above 50 ☐

3. Educational Background

1. Secondary Education ☐

2. College Diploma ☐

3. BA/BSC ☐

4. Masters ☐

5. Doctoral Degree ☐

4. Year of service

1. 1-5 years ☐

2. 6-10 years ☐

3. 11-15 years ☐

4. 16-20 years ☐

5. above 20 years ☐

PART 2. Critical success Factors in ERP

Instruction: please put a thick mark (√) on the Answer of your choice for the following likert scale questions. The value of the Scales is

1=strongly agree 2=agree 3=neutral 4= disagree and 5=strongly disagree.

5. Dimensions of critical success factors of ERP implementation

Dimensions	**scale**				
Top management and support	**1**	**2**	3	4	5
There is Top Management Support and assistance regarding Technological acceptance					
Top management provide commitment and full support for ERP Implementation					
Top Management Support the Implementation Team positively					
There is Active and persistent top management support at your organization					
Effective Project Management					
The project implementation was done by responsible project leaders					
There was a formally established project team while undertaking the ERP Implementation					
Education and Training					
There is sufficient material and adequate training about the ERP system					
There is clear understanding of ERP implementation by the users of the software at your organization					
Education and training is prioritized at your organization in order to make users of the system understand it.					
Organizational culture					
ERP implementation has a positive impact on your organizational culture					
The integrated system of ERP has influenced your organizational culture positively. ERP is a perfect match for Your organizational culture.					

PART 3 . ERP Implementation

Instruction: please put a thick mark (√) on the Answer of your choice for the following likert scale questions. The value of the Scales is

1=strongly agree 2=agree 3=neutral 4= disagree and 5=strongly disagree.

6. ERP implementation

	scale				
Leadership fit between ERP and organization	**1**	**2**	3	4	5
The leaders are charismatic and facilitated the implementation that benefits the organizational style					
Compared to other industries in the field, your organization has benefited by implementing ERP system software.					
System integration					
ERP is fully integrated and eases the day to day operations of your organization.					
Integration of the ERP system with the organizations data has led to a successful organizational outcome.					
The organization performance is better with ERP system users than non-ERP system users					
User involvement					
The longer the experience with ERP system users ,the better the organization performance					
The ERP system software has a domino effect on every aspect of the organization					
Participation and support					
There is a clear guide on ERP implementation which results in better performance for employees at every stage of your organization					
Implementing the ERP has led to greater use of technology and increased business performance of workers					
Employees are highly motivated to do their work after implementation of ERP resulting increased performance					

7. Overall firm performance

Organizational performance		**scale**			
	1	**2**	3	4	5
Due to ERP cost of operations has been reduced					
ERP has enabled effective utilization of resources by reducing cycle time and led to greater use of resources resulting increase in performance					
There is improvement in efficiency of resource utilization due to ERP					
Planning and control of resources takes lesser inputs (time, cost, effort) due to ERP					
More accurate and prompt data is obtained for decision making from ERP					
Usage of ERP has increased employee satisfaction					
ERP has led to greater market share in the industry compared to non users of the system					

Thank you for your cooperation!