St. Mary's University College
School of Graduate Studies
Department of MBA Accounting and Finance

ASSESEMENT OF ERP IMPLEMENTATION: THE CASE OF HEINEKEN BREWERIES S.C ETHIOPIA

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Addis Ababa

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Statement of Declaration

I, Saron Gebremedhin G/Egziabher, hereby declare that this thesis entitled "Assessment of ERP Implementation: The Case of Heineken Breweries S.C." submitted by me for the award of the degree of Master of Business Administration, St. Mary University College at Addis Ababa, Ethiopia, is my original work and it has never been presented in any university. All sources and materials used for this thesis have been duly acknowledged.

Name: Saron Gebremedhin G/Egziabher

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Place: Addis Ababa

Date of Submission: June 2017

This master thesis has been submitted for examination with my approval as thesis.

Advisor Name: Abebaw Kassie (PhD)

Signature_____ Date_____

St. Mary University College

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This is to certify that the thesis entitled, "Assessment of ERP Implementation: The Case of Heineken Breweries S.C." was carried out by Saron Gebremedhin G/Egziabher under the supervision of Abebaw Kassie (Phd), submitted in partial fulfillment of the requirements for the degree of Master of Business Administration in Accounting and Finance complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Approved by:

Internal examiner: Zinegnaw Abiy (PhD) Signature _____ Date _____

External examiner: Abebe Bayou (PhD) Signature _____ Date _____

Advisor: Abebew Kassie (PhD) Signature _____ Date _____

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List of Acronyms

(ERP)-Enterprise resource Planning

(MRP)-Material Requirements Planning

(IT)-Information technology

(CSF)- Critical success factor

(KSFs)-key success factors

(TMS)-Top management support

(PTC)-Project team competency

(UTE)-User training and education

(IC)-Interdepartmental communication

(BPR)-Business process reengineering

(CI)-Consultant involvement

(OLS)-Ordinary Least Square

(SPSS)-Statistical Package for Social Sciences

(CLRM)-Classical Linear Regression Model

(ARCH)-Autoregressive Conditional Heteroscedasticity

(VIF)-Variance Inflation Factor

(JB)-JarqueBera Test

(BLUE)-Best Linear Unbiased Estimators

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Abstract

The purpose of this study is evaluating the success of ERP implementation in Heineken Breweries S.C. ERP plays an important role in today's enterprise management and is beginning to be the backbone of organizations. However, its implementation is complex and risky. Research has been done for ERP implementations in numerous environments but there is a serious gap in the literature regarding implementations in the Ethiopia context. Besides, studying ERP implementation in developing countries like Ethiopia which has not had noticeable experiences would be interesting for developers, vendors, consultants and ERP user companies. In this research, the researcher had investigated ERP implementation in Heineken Ethiopia Operating companies which had implemented and used this system. The evaluation was based on CSFs (Critical Success Factor) which cited as index for success of ERP implementation in others researches. The study found that CSFs has significant relationship with successful ERP implementation at Heineken Ethiopia operating company. That indicates Heineken has implemented the ERP system successfully and smoothly. The study also shows all six CSFs are the most important to success of the ERP implementation at Heineken: top management support, project team competency, user training and education, interdepartmental communication, Business Process Reengineering and Consultant Involvement. The researcher recommended for other beer organizations to consider the Six Critical Success Factors while implementing ERP system. Furthermore, practical implications to Heineken Ethiopia operating companies, other organizations and future studies were highlighted.

***Key Words**: Critical Success Factor, ERP, HBSC*

Chapter One

Introduction

1.1. Background of the Study

Every aspect of management in the modern age relies heavily on information to thrive. Nothing move without information and it is generally believed that information is power and that who has it has power. It is an important resource needed to develop other resource. Changing circumstance and environments have necessitated the need for the proper dissemination of information at various levels of management. The development and use of Enterprise Resource Planning (ERP) is a Modern Phenomenon concerned with the use of appropriate information that will lead to better planning, better decision making and better results. This paper will explain information systems ideas in general and then will focus on Enterprise Resource Planning (ERP) as most sophisticated and its problems, implementation and critical success factors for ERP implementation (Davenport, 2000).

An enterprise resource planning (ERP) system is a packaged software system that enables a company to manage the efficient and effective use of resources (inventory, materials, human resources, sales, marketing, finance, customer information, etc.) by providing a total, integrated solution for its information processing needs (Koch, 2006).

The growth and the acceptance of Enterprise Resource Planning (ERP) have been rapid due to competitive advantages ERP imposes on manufacturing companies. ERP systems attempt to integrate all corporate information in one central database, they allow information to be retrieved from many different organizational positions, and in principle they allow any organizational object to be made visible, which enables companies to gain a distinctive competitive advantage over its rivals. Heineken is one of the few manufacturing industries which has recently began using ERP system in its branch in Ethiopia; it is globally known for brewing, distributing and selling world class beer. The word manufacturing comes from the Latin word, manu factus, which translates to ‘making by hand or use a hand to make a thing'. Manufacturing is a process of transforming raw materials into finished goods (Kalpakjian & Schmid, 2006). Manufacturing involves the production of a good where a human activity takes part in order to produce other products.

Manufacturing is usually intended for making a mass production of products for sale to customers in order to gain profit.

1.2. Background of the Organization

Heineken is an independent global brewer, committed to surprise and excite consumers with its brands and products everywhere. The company was founded in 1864 by Gerrard Adrian Heineken. Heineken is Europe's largest brewer and the world's second largest by consolidated volume. The company's aim is to be a leading brewer in each of the markets in which it operates and to have the world's most valuable brand portfolio. The Company is present in over 70 countries and operates more than 165 breweries. Heineken is committed to the responsible marketing and consumption of its more than 250 international premium, regional, local and specialty beers and ciders. The number of people employed is over 81,000.

Heineken has a long history with Africa and was exporting beer to various African countries (Ghana, Nigeria, Liberia and Sierra Leone). Africa is a major part of the overall business: it provides 14.5% of the revenue or 14.1% of the beer volumes. Heineken are investing massively in Africa because the continent is really moving fast. In Africa, Heineken supports 1.1 million direct and indirect jobs.

Heineken made acquisition of Harar and Bedele Breweries in Ethiopia. In 2012 Heineken commenced the construction of a new Greenfield brewery, which was fully operational in January 2015. Since then the Ethiopian beer market is growing fast. The market practically doubled over the past years. The main drivers for growth are a growing population, urbanization and rising incomes. HEINEKEN's key brands are Walia, Bedele Special, Bedele Regular, Harar, Hakim Stout and Sofi Malt.

Heineken Ethiopia planned a reengineering project which was undertaken from 2012 to 2014 and that was mainly designed to introduce world class business processes including the implementation of “Enterprise Resource Planning” system. In the meantime, the company had been working with different African and European international companies in the form of outsourcing of some activities, benchmarking and consultation services. Heineken has implemented ERP system in its three operating companies located in Kilinto, Harar and Bedele. The aim of this study is to assess the critical success factors in ERP implementation.

1.3. Statement of the Problem

Enterprise resource planning (ERP) system has been one of the most popular business management systems, providing benefits of real-time capabilities and seamless communication for business in large organizations. However, the implementation of ERP systems is not easy and figures show very high failure rate (Davenport, 2000). There are a number of challenges that companies may encounter in implementing ERP systems (Ibrahim, 2010). ERP Systems are complex, and implementing one can be a difficult, time-consuming, and expensive project for a company (Davenport, 2000). The technology is tightly integrated and requires a commitment from all divisions and often a change in the way a company does business to make it work. It can take years to complete successful implementation. Moreover, there is no guarantee of the outcome. ERP implementation can reap enormous benefit for successful companies-or it can be disastrous for organizations fail to manage the implementation process. ERP system implementation is also highly affected by the culture of the country and organization.

There has been a lot of research on identifying success factors of ERP implementation in the world. In the context ofEthiopia, as per the knowledge of the researcher only two studies have been conducted. (Sintayehu, 2014) Tried to assess success factors for implementation of SAP ERP at Ethiopian Airlines. (Derese, 2013) Has conducted a study on Oracle ERP system at Ethio-Telecom, a government company. But, research on Ms-Dynamics ERP implementation in Ethiopia has not yet been conducted. SAP and Oracle has difference in duration of implementation, cost and payback period which will have an indirect effect on implementation success. This indicates that there should be more research on ERP in Ethiopian context.

Heineken is a global manufacturing company, which is working in three operation areas in Ethiopia; Kilinto, Harar and Bedele. The company has implemented Ms-Dynamics ERP in its three breweries during 2012-2014. This study aims to measure the extent of ERP implementation success in these three breweries, and the relationship between the critical success factors and the success of ERP implementation. As per the knowledge of the researcher, there is no paper that assess the implementation of ERP implementation in the beer sector in Ethiopia.

In addition to that, currently, after implementing the phase one Project Navision pane system, the company is on the edge of implementing the second phase of Enterprise resource Planning. Hence, the company has to learn from the strengths and weaknesses of the first phase implementation -

they have to know clearly the real benefits they enjoyed and the problem they faced on first phase and have to take corrective action for the upcoming second phase.

Considering that most of studies in critical success factors of ERP implementation are contextualized in developed countries and there are no previous studies under this topic in Ethiopian Beer manufacturing sector, the tremendous amount of expenditures, capabilities and efforts allocated on ERP projects, high failure ration of ERP implementation and the importance of the lesson to the implementation of the second phase project in Heineken; this study will measure the success of ERP implementation and identify the critical success factors of ERP implementation in Heineken Ethiopia companies.

1.4. Research Questions

The objectives of this research are as follows:

General objective

The study has a general objective of evaluating the success of ERP implementation in Heineken Breweries SC based on five identified critical success factors.

Specific objectives

The specific objectives of the study are;

1. To measure the extent of ERP implementation success
2. To examine the effect of top management support on Reimplementation in Heineken Ethiopia.
3. To examine the effect project team competency and capability on ERP implementation in Heineken Ethiopia.
4. To examine the effect of user training and education on ERP implementation in Heineken Ethiopia.
5. To examine the effect of interdepartmental communication on ERP implementation in Heineken Ethiopia.
6. To examine the impact of business process reengineering (BPR) on ERP implementation in Heineken Ethiopia.

7. To examine the effect of consultants involvement on ERP implementation in Heineken Ethiopia.

1.5. Research Hypothesis

The purpose of this study is to examine the critical success factors of ERP implementation in Heineken Ethiopia operating companies. Depending on the review of empirical studies made around the world, the researcher has developed the following hypothesis.

- *Hypothesis 1: Top management support affects significantly and positively the success of ERP implementation.*
- *Hypothesis 2: Project team competency and capability affects significantly and positively the success of ERP implementation.*
- *Hypothesis 3: User training and education affects significantly and positively the success of ERP implementation.*
- *Hypothesis 4: Interdepartmental communication affects significantly and positively the success of ERP implementation.*
- *Hypothesis 5: Business process reengineering (BPR) affects significantly and positively the success of ERP implementation.*
- *Hypothesis 6: Consultants involvement affects significantly and positively the success of ERP implementation.*

1.6. Scope of the Study

The scope of this research is bound to conducting a single-case study to investigate the effectiveness of ERP system implementation in manufacturing industry in a case of Heineken owned Beer companies. The study covered ERP implementation in three separate business entities namely Heineken, Harar and Bedele. Heineken, Harar and Bedele are located in central, eastern and western part of Ethiopia respectively.

1.7. Significance of the Study

Implementing an ERP system is a major project requiring a significant level of resources, commitment and changes throughout the organization. Often the ERP implementation project is

amongst the biggest projects that an organization may launch. As a result, the issues surrounding the implementation process have been one of the major concerns in industries.

By identifying the critical success factors of ERP implementation, the finding of this study will enable management of Heineken to have an insight about the systems functionality by highlighting the gains achieved and the challenges faced. In addition, the recommendations of this study will also be used as an input for the planned second phase ERP System implementation in Heineken. Other companies who have a plan to implement ERP system could also learn from the result of the study. Moreover, the study will play a significant role as a literature base on future researches of related topics.

1.8. Organization of the Paper

The paper has contained five chapters. The first chapter presented background of the study, statement of the problem, objectives, significance, and scope and limitations of the study. Discussion in chapter two focuses on literature review of important concepts that are relevant to the study. The third chapter deals with the methodologies, which include data source, sampling frame and sampling size, data collection instrument and data analysis method in the study. The fourth chapter discusses the findings of the study. Based on the finding of the study, the Fifth chapter presents conclusion and recommendation of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2. Enterprise Resource Planning (ERP)

2.1. ERP Overview

Enterprise resource planning (ERP) is an industry term for the broad set of activities that helps an organization manage its business.

An important goal of ERP is to facilitate the flow of information so business decisions can be data-driven. ERP software suites are built to collect and organize data from various levels of an organization to provide management with insight into key performance indicators.

An Enterprise resource Planning (ERP) system is a packaged business software that integrates organizational processes and functions into a unified system.

In traditional IT systems, each of the system components are found separated as applications by their own with one database system for each of them. However, ERP system integrates all of the components through one central database which is common for all the modules as

Evolution of ERP

Table 2.1 Evolution of ERP

1960s	Inventory Control Packages
1970s	Material Requirements Planning (MRP)
1980s	Manufacturing Resources Planning (MRP II)
1990s	Enterprise Resource Planning (ERP)
2000s	Extended ERP

As illustrated earlier in 1960s Inventory Management and control is the combination of information technology and business processes of maintaining the appropriate level of stock in a warehouse. The activities of inventory management include identifying inventory requirements, setting targets, providing replenishment techniques and options, monitoring item usages,

reconciling the inventory balances, and reporting inventory status. (MichaelD. Okrent et al, 2004) cited in (Bin Embong, 2008).

In the 1970s Material Requirement Planning (MRP) Materials Requirement Planning (MRP) utilizes software applications for scheduling production processes. MRP generates schedules for the operations and raw material purchases based on the production requirements of finished goods, the structure of the production system, the current inventories levels and the lot sizing procedure for each operation..

1980s Manufacturing Requirements Planning or MRP utilizes software applications for coordinating manufacturing processes, from product planning, parts purchasing, inventory control to product distribution.

1990s Enterprise Resource Planning or ERP uses multi-module application software for improving the performance of the internal business processes. ERP systems often integrate business activities across functional departments, from product planning, parts purchasing, inventory control, product distribution, fulfillment, to order tracking. ERP software systems may include application modules for supporting marketing, finance, accounting and human resources.

2.2. Core and Extended Components of an ERP System

There are three most common core ERP components

1. Accounting and Finance
2. Production and Materials Management
3. Human Resource

1. Accounting and finance manages accounting data and financial processes within the enterprise with functions such as general ledger, accounts payable, accounts receivable, budgeting, and asset management.
2. Production and materials management component handles the various aspects of production planning and execution such as demand forecasting, production scheduling, job cost accounting, and quality control.

3. Human resource component tracks employee information including payroll, benefits, compensation, performance assessment, and assumes compliance with the legal requirements of multiple jurisdictions and tax authorities.

2.3. Main and Sub-Modules of ERP System

Table 2.2 Main and Sub-Modules of ERP System

Main module	Sub-modules
Financials	• GL - General Ledger • AP - Accounts Payable • AR - Accounts Receivable • AM - Asset Management • Cash Management • Banking • Profitability Analysis • Budgeting and Controlling
Human Resources	• PY - Payroll • OM - Organizational Management • Personal planning • TM - Time management • Travel expenses • Training
Logistics & Operations	• MM - Materials Management • PP - Production planning • Materials planning (MRP) • Inventory management • Quality management • PS - Project System management • Shipping
Sales & Marketing	•Order management • Sales management • Sales planning • Pricing • After-sales service

2.4. Pros and Cons of ERP

There are different initiatives and reasons for acquiring ERP systems. (Chung, 2007). Argued that ERP systems have the advantage of all-in-one integration between all parts and processes of a company, and this in turn gives the possibility of proper control. They are used to control and

reduce data redundancy and accuracy. Redundant tasks will be removed and the efficiency of the company increases. In general, compared to the traditional functional IT systems, ERP systems provide different benefits to a company and these benefits can be viewed in different dimensions as operational, managerial, strategic, IT infrastructure and organizational (Chung, 2007).Also express ERP System benefits in different dimensions

Operational: Operational benefits are Productivity improvement, Cost Reduction, Quality Improvement and Customer Satisfaction.

Managerial: Decision making, Resource Management, Strategic Business Growth, Business Cooperation and Business Leadership.

IT Infrastructure: Business Change Flexibility, IT Cost Reduction and Increased IT Capability

Organizational: Common Vision, Empowerment and Changing Work Patterns

The other advantage of ERP systems is that easier and timely reports functionality. Users can get self-services of data needs and access. They can run their own reports and have better access to their data and the ability to manipulate and report on this data.

The advantages of ERP Systems are summarized as below:

- ✓ Integrate financial information of different sources such as revenues, sales and cost.
- ✓ Standardize Human Resources information for simple tracking of employees time and benefits data.
- ✓ Standardize and speed up operating processes
- ✓ Reduce inventory and lower costs
- ✓ Integrated, on-line, secure, self-service processes for business
- ✓ Eliminate costly mainframe / fragmented technologies
- ✓ Empower and enable employees, partners, customers and suppliers.

In summary, ERP application can help organizations in various ways of business aspect. The common importance of ERP that can be conclude are it helps in reduction of organization's operating cost can be reduced, integrates all parts of an organization, increases the efficiency of operations as a result of the integration, integration on information systems which enables free flow connection of information across the organization and enables consolidation of different software within the organizations. (Zuckerman et al, 1999) as cited by (Bin Embong, 2008) argued

that Enterprise Resource Planning can streamline the business operations and play a role as a key of successful ingredient to gain competitive advantages within the organizations.

On the other hand, ERP systems have some drawbacks and limitations. These systems are usually complex. Regardless of their long-term benefits and reduced maintenance costs, initial one time implementation is expensive. And even if data accuracy and integration is achieved by ERP systems, it is hard to correct or amend data once it is maintained in the system as it will affect many modules and processes. While ERP systems have more efficient methods, freedom and self-creativity practice with the system is minimal.

Since it is important to create a comparison between the advantages and disadvantages of ERP so that I can show the significant differences occurred before and after the implementation of the system.

Some of the disadvantages of ERP are time consuming, followed by expensive, conformity of the modules, and features and complexity.

- ✓ **Time consuming**

ERP implementation is longer and can take from six months to several years to complete. The ERP software functions itself will usually be available in used approximately in every six month (Michael D. Okrent et al, 2004).As cited by (Bin Embong, 2008).

Companies that install ERP do not have an easy time to gain the benefits of it. Companies usually will change their ways of business and the ways people do their job after implement the ERP system and this will take times. The important thing is not to focus on how long it will take. It is effective to understand the potential benefits and how to use wisely the system in order to improve the business itself because ERP implementation will take almost between one to three years in average. (Stevenson, 2007). As cited by cited by (Bin Embong, 2008).

- ✓ **Expensive**

ERP are expensive to implements. The price includes with general information technology (IT) infrastructure. Cost may be change from thousand dollars to millions and the business process reengineering cost in infrastructure may be extremely high and create result in budget overrun. It is include with the hidden cost of ERP implementation that usually a company will face in the following areas.

A. Training

Training fees for the workers are high because of difficulties of implementing complex as ERP.

B. Integration and testing

Hidden cost in ERP such as testing the links between ERP package and other corporate software links.

C. Data conversion

Data conversion like moving the corporate information such as customers and supplier record, products design data, and etc. will costs money.

D. Data analysis

For an analysis purpose, the data from the ERP system must be combined with the data from external systems. This will charge as the cost of a data warehouse in the ERP budget.

E. Consultants

Consulting fees will be charges and usually become higher if it involve outside consulting firm besides of own vendor's consultant

- ✓ **Conformity of the modules**

The architecture and components of the selected system should conform to the business processes, culture and strategic goals of the organization. A one reason for ERP implementation to fail is the software itself does not fix the one of important business processes for a company.

- ✓ **Features and complexity**

According to (Koes Boersma, 2005) cited in (Bin Embong, 2008) argued that ERP systems are not easy to be defined and are complex and dispersed within and between organizations because of its system modules and complexity of implementation. Each of the position involves in ERP system in organizations said that these system are elusive where the system itself are in constant instability. Nowadays, some of the mid average companies having difficulty on the performance of ERP system due to lack of effective evaluation features and models of the system ERP system may have too many features and modules so the user needs to consider carefully and implement the needful only.

2.5. Importance and Impact of ERP systems on Industry and Organizations

There are many benefits to having an ERP system within the organization. Information is readily available for the proper users, all data is kept in a central repository, data redundancy is minimized, and there is a greater understanding of the overall business picture.

ERP systems bring corporate business processes and data access together in an integrated way that significantly changes how they do business.

Companies realize the business value of ERP systems with the ability to obtain business process integration. Business process integration allows processes within a company to be incorporated together in one centralized system. The value of encompassing process integration permits companies to gain efficiencies in overall and individual processes. (Fuβ, 2007).

Have researched multiple articles and developed a list of anticipated benefits of ERP systems. The list includes the following benefits:

- ✓ Improved security and availability
- ✓ Increase in organizational flexibility
- ✓ Cost reduction
- ✓ Fast amortization of investment
- ✓ More efficient business processes
- ✓ Higher quality of business processes
- ✓ Improved integrality
- ✓ Reduced complexity and better harmonization of IT infrastructure
- ✓ Better information transparency and quality
- ✓ Better and faster compliance with legal requirements and frameworks

ERP systems continue to be impactful towards industry and organizations. So many innovations have been developed and implemented just in the last five to ten years. More focus has been made towards supply chain management and customer relationship management. Many ERP vendors have incorporated these modules into their systems to help better serve customers.

Vendors realize the need for the companies they serve to continue to be scalable, flexible, and have the ability to compete in their respective industries.

One future impact is the incorporation of cloud computing. Cloud computing is going to allow companies to free up resources, because the company will have a third party hosting the system and software needed to do business over the Internet. ERP systems could be included in this

opportunity. More companies will be served with this new capability. The company will not be required to manage the hardware and software used. Companies will be all owed to pay as they use the service, instead of making a capital investment (Ford. S, 2010).

2.6. ERP Implementation

(Jose M. Esteves, 1999)**,** argued that ERP system goes through different life-cycle stages during its whole life within the hosting organization. The complete ERP life-cycle is divided into six generic stages. These stages are adoption decision phase, acquisition phase, implementation phase, use and maintenance phase, evolution phase and retirement phase.

2.7.1 ERP Life-Cycle Stages

- ✓ Adoption Decision
- ✓ Acquisition phase
- ✓ Implementation phase
- ✓ Use and maintenance phase
- ✓ Evolution phase
- ✓ Retirement phase

Source: (Esteves, 1999)**.**

1. Adoption Decision Phase

In this phase, the need for ERP system is reviewed and decided while selecting an information system which best addresses the critical business challenges and improve the organizational strategy. It is in this stage that the system requirements, its goals and benefits are defined. Analysis of the impact of ERP adoption at a business and organizational level is done here.

2. Acquisition Phase

Acquisition phase is selection of ERP product system which best fits the requirements of the organization and minimizes customization needs. Consulting company is selected in this phase to help in the next phases of the ERP life-cycle. Issues of price, training and maintenance services are analyzed and a contractual agreement is defined here. Return on investment analysis of the selected product should also be done in acquisition phase.

3. Implementation Phase

In this phase, the acquired ERP system is customized, parameterized and adapted to the needs of the organization. This phase is usually done with the help of consultants and implementer partners who provide implementation methodologies, know-how and training.

4. Use and Maintenance Phase

This is the stage when the system must be used in a way that returns expected benefits and minimizes disruption. This is referred to as Establishment Period, the period after go live until the system gets stabilized. In addition, once a system is implemented it must be maintained to correct malfunctions and optimize its functionality.

5. Evolution phase

Evolution phase is the integration of more capabilities to the ERP system and expanding it to incorporate new benefits and functionalities.

6. Retirement phase

This phase is the time when decision is made to replace the ERP system with other information systems due to its inadequacy to the current needs of the organization or availability of new technologies.

ERP systems can be complex and difficult to implement, but a structured and disciplined approach can greatly facilitate the implementation.

2.7. Factors Contributing for ERP Implementation Failure

Superficially, no single point of failure can be attributed to unsuccessful ERP implementations. Some of the causes cited for failed ERP projects include:

Inherent complexity of ERP implementation

- ✓ Outside consultant issues
- ✓ Inadequate training
- ✓ Process risk and process barriers
- ✓ Corporate culture
- ✓ Unrealistic expectations

- ✓ Over-customization of software
- ✓ Using IT to solve the problem
- ✓ Timeline flexibility
- ✓ Infrastructure issues

Source: (Barton, 2001).

2.8. ERP Critical Success Factors

The identification of CSF before the start of the project is somewhat critical for the successful implementation of ERP systems (Esteves, 1999). A number of empirical and non-empirical studies have talked a variety of CSF for ERP implementation. The results of some major research on ERP implementation success factors have been defined below.

(Holland, 1999).Presented a number of success factors in ERP implementation and suggested their division into strategic and tactical factors. The model was illustrated on a sample of two ERP implementation projects. Among 12 factors, the authors highlighted the critical impact of legacy systems upon the implementation process and the significant of selecting an appropriate ERP strategy. (Somers T.M., 2001). Pronounced the importance of CSF across the stages of ERP implementations using the responses from 86 organizations implementing ERP. From their broad list of 22 CSF for ERP implementation, the most important are: top management support; project team competence; interdepartmental cooperation; clear goals and objectives; project management; and interdepartmental communication.

(Al-Mashari, 2003).Presented a taxonomy of ERP critical factors where 12 factors were divided into three dimensions related to the stages of ERP project, which are: setting-up, deployment and evaluation. The taxonomy presented emphasizes that a clear vision and business director is fundamental for the success of ERP system implementation.

(Chen, 2001). analyzed several critical planning issues prior to the ERP adoption decision, including needs assessment and choosing a right ERP system, matching business process with ERP system, understanding the organizational requirements, and economic and strategic justification. He reported that competitive strategy, targeted market segments, customer requirements, manufacturing environment, characteristics of the manufacturing process, supply chain strategy and available resources all enter into the decision of ERP adoption.

2.9. CSF for ERP Systems Implementation

- ✓ Top management support
- ✓ Project management
- ✓ Use of consultants
- ✓ Business process reengineering
- ✓ Project team competence
- ✓ Change management
- ✓ Interdepartmental communication

1. Top Management Support

Top management support has been constantly recognized as the most vital and crucial success factor in ERP system implementation projects. Top management support in ERP implementation has two main facets:

A. Providing leadership and
B. Providing the necessary resources

To implement ERP system successfully, management should monitor the implementation progress and deliver clear direction of the project. They must be willing to allow for a mindset change by accepting that a lot of learning has to be done at all levels, together with themselves (Bhatti T. , 2002).

(Bradford, 2000).Stated that one organization characteristic, top management support, was contributory in explaining ERP implementation success. Top management must take a dynamic role in leading the ERP implementation. The success of a main project like an ERP implementation totally depends on the strong, sustained commitment of top management. This obligation when transferred down through the organizational levels results in an overall organizational commitment (Bingi, 1999).

Management must be involved in every step of the ERP implementation. Some companies make the serious mistake of handing over the responsibility of ERP implementations to the technology department. This risks the entire company's existence because of the ERP system's profound business implications. An overall organizational commitment that is very noticeable, well-defined, and felt is a sure way to ensure a successful implementation (Umble, 2002).

Similarly, (Glaser, 1999).Stated that there must be an established strong commitment to successfully implementing the new system by presentation strong leadership from senior management, restrictive the initial scope of the project, and working towards achieving an early success.

Leadership support is essential for all levels of the organization, especially since ERP systems are widespread organizational change.

If top management is not strongly committed to the system, and if does not participate actively, the implementation has a high probability of letdown. And if top management leads the project without a clear leadership and commitment the power inherent in a new information will be wasted (Umble, 2002). When Top management needs to openly and explicitly identify the project as a top priority (Wee, 2000). Senior management must be dedicated with its own participation and readiness to allocate its effort to implementation (Holland, 1999). This involves providing the needed people for the implementation and giving suitable amount of time to get the job done (Roberts, 1992). New organizational structures, roles and responsibilities should be established and approved. Policies should be set by top management to establish new systems in the company. In times of conflict, managers should mediate between parties (Roberts, 1992). A successful implementation is only achievable when high-level executives have a strong commitment to the project (Davenport, 2000). The boldness of senior managers will touch not only the flow of funds and information to the project, but also the subordinates understanding the project, its future influence upon the company as a whole, and its impact upon the employees as valued and talented individuals. Top management support is desirable throughout the implementation. The project must obtain approval from top management (Sumner, 1999). And align with planned business goals, this can be achieved by top management bonuses to project success (Wee, 2000).

2. Business Process Reengineering (BPR)

(Bingi, 1999).Definite that implementing an ERP system involves reengineering the existing business process to the greatest business process standard. ERP systems are constructed on best practices that are followed in the industry. According to (Umble, 2002).Automating existing redundant or non-value-added processes in the new system can cause an implementation to fail. The combined environment of the new ERP system will require the organization to conduct

business in a dissimilar way. The proper implementation of an ERP system should force key business processes to be reengineered and cause a consistent rearrangement in organizational control to tolerate the effectiveness of the reengineering efforts.

An ERP system will clearly change the normal style of operation within and between functions, but it will also change many social systems throughout the organization.

When organization implement ERP A certain level of BPR should be involved, as the packaged software may be incompatible with the needs and business processes of the organization. In order to improve the functionality of the software in accordance with the needs of the organization, an organization should reengineer business processes to fit the software instead of trying to modify the software to fit the organization's current business processes (Ngai, 2008). To achieve the greatest welfares provided by an ERP system, it is authoritative that the business processes are aligned with the ERP system. Both the reengineering literature and the ERP literature suggest that an ERP system alone cannot improve organizational performance unless an organization restructures its business processes (Somers T.M., 2001).

A crucial part of working with the ERP functionality is the ability to modernize operations. When implementing a system, many organizations fail to specify their organizational objectives. Job skills are raised by the requirements of the new, post-implementation company. Some customization will always be required in order to meet individual needs (Themistocleous, 2001). But Modifications should be avoided to reduce errors and to take advantage of newer versions (Rosario, 2000). Process modelling tools help aid customizing business processes without changing software code (Holland, 1999). Broad reengineering should begin before choosing a system. In conjunction with configuration, a large amount of reengineering should take place iteratively to take advantage of improvements from the new system. Then when the system is in use reengineering should be carried out with new ideas (Wee, 2000).

3. User training on software and Education

User training on software should a company give an attention. But when this issue is ignored, mainly it does not have the largest quantifiable benefit for a company who implement ERP, expenses are greatly increased in the long run. By treating resource training with little respect and financial support, it is not hard to realize the reality of delay, confusion and financial ruin that may

result. Some companies preserve on assigning a fixed cost or percentage to the training effort, regardless of need or variable conditions (Gargeya, 2005). This mistake has surely been the cause of many failed implementation efforts. Fortunately, it has also been a source for others to learn from such experiences and avoid repeating the mistake (Gargeya, 2005).

(Gargeya, 2005).State that people must be handled on two levels. First, employees must be trained on the new system in order to use it to day-to-day processes. The second level is educational experience. Training, re-skilling and professional development of the IT workforce is serious. User training should be highlighted, with substantial investment in training and re-skilling of developers in software design and methodology (Sumner, 1999). Employees need training to know how the system will change business processes. There should be additional or extra training and on-site support for staff as well as managers throughout implementation. A support organization like help desk, online user manual is also critical to meet user's needs after installation (Wee, 2000). A company will never get benefits from the ERP system until the employees have no information that how to operate the new system (Jarrar. Y. F., 2000).The main reason of user training and education program to safeguard that employees are easy with the ERP system and to rise the expertise and knowledge of users (Holland, 1999). ERP system installation without fitting training can lead the system to failure (Jarrar. Y. F., 2000). Therefore training doesn't mean only to work the new system but also to know the new processes and the incorporation within the system that how the work of one user operates the work of other user (Holland, 1999). some authors in the literature has described that user training is not only limited to the users but also needed for the project team, but all others agreed specifically on the user training (Finnery, 2007). ERP is a complex system and without suitable training it is complex to use the system even the user have strong IT skill. It is significant for both end users and technical staff to focus on.

4. Change Management

Change management is another crucial and important critical success factors of ERP project implementation. To introduce ERP project in a company, change management is an important factor for successful implementation to structure the change management strategies and business process methodology to accomplish its goal (Jarrar. Y. F., 2000).

Change management is vital, starting at the project phase and continuing throughout the entire life cycle. Enterprise wide culture and structure change should be managed (Falkowski et al., 1998), which include people; organization and culture change (Rosario, 2000). Unpredictably, the most common failure factor reported was that of readiness for change. Implementing ERP system completely changes the culture of the organization (Gargeya, 2005). Many company make simplicity assumption of how an implementation will affect the culture within the organization. All changes like cultural and perception change should handle utmost care (Davenport, 2000). If people are not ready or willing to change, change simply will not occur. All managers must be charged with the responsibility of controlling worker anxiety and resistance to the ERP system (Aladwani, 2001). Organizations should have a strong corporate identity that is open to change. An emphasis on quality, a strong computing ability, and a strong willingness to accept new technology would aid in implementation efforts (Nah et al., 2001). Management should also have a strong commitment to use the system for attaining companies business aims (Roberts, 1992). Users must be trained before a company try to implement a new system, and concerns must be addressed through regular communication, working with change agents (Rosario, 2000). As part of the change management efforts, users should be involved in all design and implementation of business processes, and formal education and training should be provided to help all employees (Bingi, 1999).

Change management system believes on changing the business process for an organization, so careful attention must be given to change management system. Organizational change refers to the body of knowledge that is used to ensure the complex change. The change management approach will try to ensure the acceptance and readiness of the new system, allowing the organization to get the benefits of its use. A successful organizational change approach relies in a proper integration of people, process and technology.

Based on because ERP system completely changes the culture of organizations where many companies found hard to accomplish this successfully. Also, many companies identified that ERP implementation fail to accomplish the desired benefits because they underestimate the efforts involved in change management (Bhatti T. R., 2005).

5. ERP Consultants

(Welti, 1999) argues that the success of a project depends on the capabilities of the consultants, because they have in-depth knowledge of the software. (Somers T.M., 2001).Point out that consultants should be involved in different stages of the ERP project implementation,

Because of rapid growth within the ERP software market, there has been a shortage of competent consultants. Finding the right people and keeping them through the implementation can be a major challenge. ERP implementation demands multiple skills – functional, technical, and interpersonal. Consultants with specific industry knowledge, such as public sector, are fewer in number. The success or failure of the project depends on how well the organization can manage consultants and the necessary knowledge transfer between consultants and internal employees (Bingi, 1999).

6. Project Team competency

Project team Leader should be competent on different areas (Pavlovna, Pecherskaya Evelina, et al, 2015).

1. Professionally: -to implement ERP successfully the project team should be competent on professional expertise, Ability to implement professional expertise as appropriate and Willingness to professional commitment and knowing the system and the process in detail to guide others which are involved in the system.

2. Methodological: -to implement ERP In a successful way the second methodological competency are very critical because in this issue project teams should have the ability to know about the best possible approach and procedures, Ability and willingness to put the chosen procedure into practice.

3. Social Competence:-the third is social competency this issue is the Ability to perceive other people's thoughts, attitudes and feelings, Ability to communicate effectively, i.e. as appropriate for the given situation and the people involved, Enjoy and maintain acceptance, working with a good manner by understanding issues raised by the system users and escalating to the responsible parties.

4. Personal Competence: -the forth is conscious use of professional and methodological expertise as well as of the social environment, Networking of professional, methodological and social competencies.

7. Interdepartmental communication

Communication is like the engine for the company who implement ERP system that keeps everything working properly. Communication is as a key component across all factors of their Project Implementation Profile and maintained that "communication is crucial within the project team, between the team and the rest of the organization, and with the client".Poor communication between reengineering team members and other organizational members was found to be a problem in business process reengineering implementations. Communication and cooperation

should be of two kinds: inwards the project team and outwards to the whole organization. It is necessary to create an understanding and an approval of the implementation (Stephan A. Kronbichler, 2009).

2.10. Empirical review

(Raafat George Saade, 2016) Says that the purpose of the paper is to consolidate the critical success factors (CSFs) as published in enterprise resource planning (ERP) implementation case studies. The authors perform the analysis and propose the final CSFs based on the reported ERP implementation process stages.

The paper follows eight category coding steps proposed by (Carley, 1993) and utilizes only ERP implementation case studies to identify a distinct set of critical success factors. In this paper 37 case studies are used and provide a reasonable sample from different countries and contexts. The researcher followed two methodologies one for the literature review process and the other for the analysis and synthesis.

Out of 64 reported CSFs that were extracted from the literature and subsequent detailed analysis and synthesis the authors found a total of 22 factors that are distinct. These factors which encompass change management are suggested with five ERP implementation stages. 48 The study commended use the 22 CSFs to develop a post implementation Valuation instrument with the appropriate scales to degree them – hence the Verification of these factors quantitatively. This article sheds light on the probable Division of factors related to each implementation stage

(Huang, 2010) This article is a review of work published in various journals and special conferences on topic of Critical Success Factors (CSF) of Enterprise Resource Planning (ERP) system implementation between 1998 and 2007. The total of 524 articles are reviewed, which includes 32 CSF literatures. These Research intends to serve three goals. First, it is useful to the researchers who are interested in studying ERP CSF field. Second, it is advantageous resource to find ERP CSF research topics.

Third, it serves as a broad bibliography of the ERP CSF articles published during this 10 years period.

The literature are analyzed under two categories and time periods. The data collection phase of the literature review has involved an extensive search of many prominent MIS journals.

The researcher found some important findings. First, the trend of CSF article published during the last 10 years is not the same as ERP articles. When CSF publication reached its peak time in 1999 and 2006, ERP publication comparatively was at lower points. During 1999-2000, the number of CSF articles was become decrease while ERP articles increase dramatically. Contract to this, from 2004, ERP articles decreased gradually, whereas CSF articles increased again. This may reveal the fact of increased attention on ERP implementation critical success factor by academic world.

Second, the top 10 CSFs for 10 year period are: Top Manager Commitment; Teamwork and Composition; Education and Training; Project Management; Definition of Scope and Goals; Business Process Redesign; Change Management Program and Culture; Champion; Open and Honest Communication; and Choose the Right Vendor Right Package. However, the researcher also found that Open and honest communication and End user involvement play a vital role in ERP implementation.

Third, the researchers paid more attention to human factor than technical factors in ERP implementation more articles after 2003 put end-user's training or involvement as a CSF instead of technical skills or IT infrastructure. With the development of ERP software, it becomes more mature and needs less attention on technical parts.

(Joycelyn L. Harrison, 1997)**.** The purpose of this study is to determine the benefits sought from implementing ERP; the extent to which critical factors were present during the ERP software implementation; the level of satisfaction with the performance of implemented modules among the project managers and team members; the perceptions of project managers and team members as to the benefits and concerns of implementing ERP, the extent to which selected decision-making processes used in the organization's decision to implement ERP; and the number of modules purchased with the intent to implement versus those actually implemented. This knowledge will allow organization leaders to make more informed decisions when implementing ERP.

The population for this study consisted of those individuals who are a part of an implementation project team at a public or private sector organization in North America, which had implemented or will implement ERP software. The researcher randomly selected the participant for this study

from a known list of SAP project managers. And the researcher take a sample of 100 private sector and 100 public sector organizations this study also the researcher raised 6 research question.

The researcher use descriptive research methods to describe his data and The Statistical Package for the Social Sciences for Windows (SPSS) was used to analyze the data.

Data were collected via a survey designed by the researcher. The researcher created a survey instrument based on the benefits of implementing ERP and the critical factors affecting an ERP implementation and it was periodically reviewed by ERP professionals and modified based on their suggestions.

Descriptive statistics were used to describe respondent's level of satisfaction with the modules the researcher concluded that organizations are implementing ERP systems in both public- and private-sector organizations. It was also concluded that the benefit most often realized through ERP implementation was redesigned business processes.

In regard to critical factors present during ERP implementations, it was concluded that top management was kept well-informed of the implementation. Top management support was also present during many of the implementations of ERP systems. Although many project team members and project managers felt that their implementation was a success, it was also concluded that the project team members had a numerous of advice from their implementation experience in the areas of change management, cost management, consultants, project management, vendor issues, and training. A suggestion heard consistently was to make sure that there is top management support, employee buy-in, proper training, and trained consultants. So finally the researcher found those concluded factors are a best mechanism for both Public and private institution while they implementing ERP.

(Emad Abu-Shanab, 2015)**.**

This study explored the major key success factors (KSFs) that will turn the implementation process to a success. The study utilized 60 responses from managers and executives of local Jordanian firms and the researcher used questionnaires for the data collection instrument; also the researcher Raised 2 critical questions for his study

What are the major factors that define the success of ERP systems and how they are ranked by Jordanian firms and experts? The instrument used included some demographic data related to the

respondent and the firm of respondents. The survey included 22 KSFs utilizing a 7 point Likert scale. The scale included a statement that rates each factor as least important to the success of ERP implementation. This study explored different factors that will secure the success of ERP implementation. The researcher projected all factors in the literature and lists in a survey and distributed to executives and managers in the local Jordanian market and the results indicated an important role for top management support, user training on software, interdepartmental communication and cooperation, and project team competence. On the other hand, more controversial factors were listed at the bottom of the rank list as marginal influence on the ERP system implementation and they are: partnership with vendor, architecture choices and use of consultant. This study is the first in the Jordanian environment that utilizes a sample from the local market and addresses the perceptions of managers and executives. In this regard, a larger sample would increase the validity of this research and its findings. Also, more research in this area would enhance the instrument used and improve our understanding of the top factors influencing ERP success. Finally, results emphasize the important of top management support and involvement in the implementation process of this complex system. The study found that the top factors influencing ERP success are top management support, user training on software, interdepartmental communication and cooperation, and project team competence.

(AL-Sabaawi, 2015)**.** The purpose of this study is to describe critical success factors for ERP implementation. These study has been building by focusing on checklist and group of interviews to specific data collection form sample in Cihan University. The studies raised two main questions; 1. What are the critical factors for ERP implementation success in a Cihan university? And 2. What are the KCSFs (Key Critical Success Factors, most preferred CSFs) that should be taken into high priority for the successful ERP implementation in a Cihan university and how they are ranked by sample?

The researcher had set questionnaire which contained a total of 24 questions and categorized the questionnaire according to their functions and goals. The questionnaire also used for data collection contained scales to measure ERP success and the researcher used descriptive analysis for his analysis.

The researcher identified 8CSF in relation to ERP implementation in high education sector at developing countries. Those are Project management, Technological infrastructure,

Communication, Departments(Stakeholder) participation, Change Management, Business Plan and Vision, Commitment and support of top management, User training and education out of this the most important success factors was ERP implementation success are Project management, Technological infrastructure and Commitment and support of top management. This study has contributed to academic research by producing the empirical evidence to support the theories of CSFs and ERP implementation success at higher education. Understanding these factors is critical for the progression of the field in both academia and practice, therefore, providing a strong foundation of CSFs for further research in ERP implementation is very essential. All of these eight aspects are important to be aware of and managed in order to ensure the success of ERP initiatives in developing countries.

(Aamir Ijaz, 2014)**.** The aim of the present study was to explore critical success factor (CSFs) in implementation, pre-implementation and post-implementation phases of ERP system. The study employed case study approach guidelines of (Yin, 2009). The case study approach is a famous qualitative research strategy for the in-depth analysis of a case. The researcher interviewed fifteen face to face interviews of end users and consultants have been conducted. Different semi-structured and sometimes unstructured questions asked to respondents. A convenience sampling technique used to dig out the realities after the in-depth analysis. ERP end users and some of the member of ERP consultant team participated for the interviews. From the study 20% from contractual consultant, 40% from middle level management, 20% from lower level management, and 20% from top level management are the respondents.

The researcher analyze his study by using in-depth analysis of the company where ERP system has been implemented.

By Using NVvio 10 software and different technical mechanisms like coding & thematic analysis, word tag clouds, word tree and tree map.

The researcher identified Business Process Reengineering, change management, effective communication, effective training, infrastructure, inter-team cooperation leadership, management involvement, rewards and recognitions, standardized implementation sequence, team composition and top management commitment as the CSFs during the phase of ERP system implementation. Different CSFs have been identified in post-implementation stage such as end user satisfaction, employee motivation, organizational productivity, software reliability, professional development

services and support & maintenance. In Pre-implementation stage of ERP System study found different CSFs such as Clear objectives and scope, complete awareness, organizational analysis, right product selection, study of organizational culture and team composition

(Severin V. Grabski, 2011)**.** The aim of this study is to identify the risks and controls used in ERP implementations with the researcher examine each of the above risks in more detail and specify controls that can be utilized by organizations to minimize that risk.

In this study the researcher use interviews, survey and archival data sources and the researcher conduct four interview sessions: (1) the Director of Financial Services and the Business Analyst; (2) the Systems Analyst and the Information Technology Services (ITS) manager; (3) the Consultant; and (4) the Internal Auditor

Finally the researcher found that BPR; the project team members 'skills and knowledge; the consultant's involvement; post implementation review; internal auditor's involvement; formulation of the steering committee; managerial "people" skills; and training sessions were vital to minimize risks. The results of this research provide support for the proposition that the success of an ERP system implementation is dependent, in the first instance, on identifying the major business risks and the controls that need to be put in place to minimize those risks.

Objective to understand the ways in which organizations can minimize the business risks involved. The study was motivated by the significance, for both the research and practice communities, of understanding the risks and controls critical for the successful implementation of ERP systems.

based on a review of the ERP literature, the researcher list five major business risks associated with the implementation of ERP systems: the lack of alignment of the new information system and business processes; the possible loss of control due to decentralization of decision making; risks associated with project complexity; the potential lack of in house skills; and users' resistance.

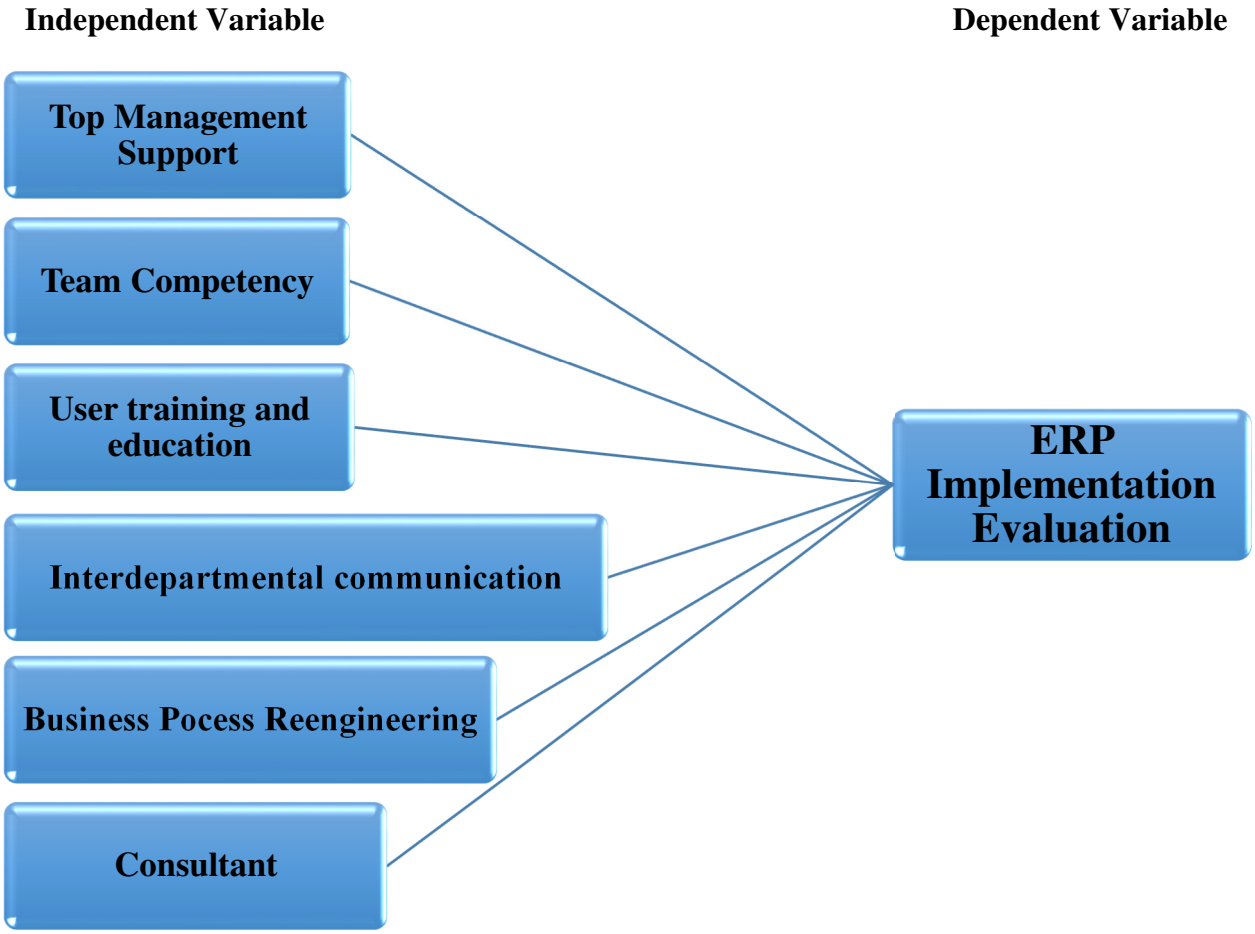
Conceptual Framework

A conceptual framework is an analytical tool with many variations and contexts. It is used to make conceptual distinctions and organize ideas by using diagrams or charts and the like. Hence, the researcher tries to see the relationship between Independent variables (top management support, project team competency, user training and education, interdepartmental communication, business process reengineering, Consultant involvement and Dependent variable (ERP implementation

success). The researcher chose these variables due to the fact that previous researchers which are discussed in the literature review section identified that these variables are the critical success factors that affect ERP implementation moreover these variables are the ones that captures the essence of the study.

Conceptual Framework

Figure 2.1 Conceptual Framework



Source: Developed for the research

CHAPTER THREE

RESEARCH METHODOLOGY

3. Introduction

Research Methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically (Kothari, 2004). In this three, the Research Design, Sampling Design, Data Collection Methods, and Data Analysis are discussed in details. All the elements in this chapter are constructed based upon the purpose of the research which is identifying the CSFs of ERP implementation. Primary data will be mainly used for this research.

3.1. Research Design

Since the research tries to achieve different objectives, the research design is mixed between exploratory, descriptive and explanatory methods. The purpose of this study was exploratory since the study is to assess ERP implementation in light of critical success factors and understand what is happening in an ERP implementation case through use of questionnaire and document review. The study is partly descriptive because it tries to measure the extent of ERP implementation success. And it is explanatory, because it examines the relationships between six independent variables, which are top management support, project team competency, user training and education, interdepartmental communication, BPR, Consultant involvement and the dependent variable ERP implementation success.

3.2. Population and Sampling Design

Study Population

Population refers to the total or aggregate of all individuals with specified characteristics (Richard, 2006). The collection of all possible observations of a specified characteristic of interest is called a population while a collection of observations representing only a portion of the population is called a sample. Since the study aimed at assessing the implementation of ERP, the target population comprised of all users of ERP (navigation pain system) Systems in Heineken operating companies. The total users of ERP implementation in Heineken, Harar and Bedele are 97.

Sample Size and Sampling Technique

Sampling helps to select the respondent according to the purpose of the study. In this study the researcher take all the population who is appropriate for the study.

Generally all of the total population has been taken in the research study. All parties involved in the implementation process of Enterprise Resources planning System are represented by the sample. The sample consists of three main clusters which are end users, project team and management.

End users are those staffs who enters the data in the system, extract data from the system or have any other interaction with the system. The project team is the end-user first contact, when it comes to issues or requirements to the application, method and process. The management is the decision maker based on the output of the system.

Based on census, the total sample size is 97 users of ERP. The questionnaire will be distributed to all ERP users in each brewery and the project team.

Model Specification

The aim of this research is to investigate the relationship between top management support (TMS), project team competency (PTC), user training and education (UTE), interdepartmental communication (IC), business process reengineering (BPR), Consultant involvement (CI) with ERP implementation success (ERS). The variables are taken from different papers discussed in the literatures taking into consideration the availability of data. The regression model of this study is estimated in the following form:

$$ERS = \beta 0 + \beta 1\ TMS + \beta 2\ PTC + \beta 3\ UTE + \beta 4\ IC + \beta 5\ BPR + \beta 6\ CI + \varepsilon$$

Source: Developed for the research

3.3. Data Collection Methods and Approach

Various sources will be used to collect data for this study. Techniques that will be used in data collection include questionnaire and documentary review.

Primary Data

The primary data are those which are collected for the first time and thus happen to be original in character **(Kothari, 2004)**. In this study, the primary data will be collected through questionnaires prepared by the researcher.

Questionnaire

The questionnaire is comprised with both open-ended and closed-ended questions. Open ended questions allow the respondent to answer freely to the subject in their own words rather than being limited to choosing from a set of alternatives.

Secondary Data

Secondary data are those that are already available, and refer to data that have already been collected and analyzed by someone else **(Kothari, 2004)**.

Documentary Review

Various documents is used to collect information needed. In this regard, the relevant Information from published and unpublished documents including textbooks, journals, Company's reports and publications related to ERP implementation, dissertations, online Materials, training manuals and different papers related to Enterprise resource planning (ERP) are planned to use.

3.4. Data Presentation and Data Analysis Methods

Data Measurement

In order to be able to select the appropriate method of analysis, the level of measurement must be understood. For each type of measurement, there is/are an appropriate method/s that can be applied and not others. In this research, ordinal scales were used. Ordinal scale is a ranking or a rating data that normally uses integers in ascending or descending order. The numbers assigned to the important (1, 2, 3, 4, 5) do not indicate that the interval between scales are equal, nor do they indicate absolute quantities. They are merely numerical labels. Based on Likert scale we have the following:

The Numbers Assigned Scale

Table 3.1 Numbers Assigned Scale

Item	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
Scale	**1**	**2**	**3**	**4**	**5**

Data Management

Data cleaning will be done prior to carrying out data analysis so as to ensure validity and Reliability. Each questionnaire will be inspected and corrected to ensure that the data Contained therein are eligible and accurate. Thereafter coding will be done by assigning numerical values.

Measurement scale references

Table 3.2 Measurement Scale References

Variable	Reference
Top Management Support (TMS)	**Ahmed Abed El-Raziq El-Kurd, (2016)**
Team Competency (capability)	**Ahmed Abed El-Raziq El-Kurd, (2016)**
User training and education	**Ahmed Abed El-Raziq El-Kurd, (2016)**
Interdepartmental communication	**Ahmed Abed El-Raziq El-Kurd, (2016)**
BPR	**Selvakumar Swaminathan,(2011)**
Consultant	**Selvakumar Swaminathan,(2011)**
ERP Implementation Evaluation	**Ahmed Abed El-Raziq El-Kurd, (2016)**

Data Analysis

First, the researcher will collect the needed data by administrating a questionnaire to employee of Heineken Breweries S.C, Harar Brewery SC and Bedele Brewery SC. After that, collected data rearranged, edited and calculated in order to become complete data that is needed for this study. Next, the collected data analyzed using descriptive statistics, and multiple linear regression analysis. The descriptive statistics (mean and standard deviations) used to analyze the general trends of the data. The descriptive statistics analyzed using the Statistical Package for Social Sciences (SPSS 20.0). A multiple linear regression model used to determine the relative importance of each independent variable in explaining the success of ERP implementation. The multiple linear regressions model is going to be conducted by the Ordinary Least Square (OLS) method using EViews9 econometric software package.

3.4.1. Ordinary Least Square

According to (Brooks, 2008).Ordinary least squares (OLS) or linear least squares is a method to estimate the slope and intercept in a linear regression model. This study will use an ordinary least squares (OLS) regression to estimate the linear equation. The rational for choosing OLS is that, if

the Classical Linear Regression Model (CLRM) assumptions hold true, then the estimators determined by OLS will have a number of desirable properties, and are known as Best Linear Unbiased Estimators (Brooks, 2008). In addition, as noted in (Petra T., 2007). OLS outperforms the other estimation methods when the following holds; the cross section is small and the time dimension is short. Therefore, as far as both the above facts hold true in this study it is rational to use OLS. Thus, the following section discussed the CLRM assumptions.

According to (Brooks, 2008).The assumptions of ordinary least squares are:

1) The errors have zero mean
2) The variance of the errors is constant and finite over all values
3) The errors are linearly independent of one another
4) There is no relationship between the error and corresponding x variate

3.4.2. Diagnostic Analysis

Diagnostic checking will be done to test whether the sample is consistent with the following assumptions:

1) The model is correctly specified
2) There is no relationship between independent variables (No multi-collinearity)
3) There is no relationship among the error term at the period t and the error term at period before t (No autocorrelation problem)
4) The error term is constant across the number of observations (Homoscedasticity)
5) The error term is normally distributed

If all the above assumptions are consistent with the sample, E-view result will be accurate and reliable. The following tests is going to be done in this research to test the above assumptions.

3.4.3. Heteroscedasticity

According to (Brooks, 2008). Heteroscedasticity means that error terms do not have a constant variance. If heteroscedasticity occur, the estimators of the ordinary least square method are inefficient and hypothesis testing is no longer reliable or valid as it will underestimate the variances and standard errors. There are several tests to detect the Heteroscedasticity problem, which are Park Test, Glesjer Test, Breusch-Pagan-Goldfrey Test, White's Test and Autoregressive

Conditional Heteroscedasticity (ARCH) test. In this study, the popular Autoregressive Conditional Heteroscedasticity (ARCH) test will be employed to test for the presence of heteroscedasticity. The hypothesis for the Heteroscedasticity test is formulated as follow:

H_0: There is no Heteroscedasticity problem in the model

H_1: There is Heteroscedasticity problem in the model

$\alpha = 0.05$

Decision Rule: Reject H_0 if p-value is less than significance level. Otherwise, accept H_0.

3.4.4. Autocorrelation

According to (Brooks, 2008).When the error term for any observation is related to the error term of other observation, it indicates that autocorrelation problem exist in this model. In the case of autocorrelation problem, the estimated parameters can still remain unbiased and consistent, but it is inefficient. The result of T-test, F-test or the confidence interval will become invalid due to the variances of estimators tend to be underestimated or overestimated. Due to the invalid hypothesis testing, it may lead to misleading results on the significance of parameters in the model. In this study to test for the existence of autocorrelation, the popular Breusch-Godfrey Serial Correlation LM Test will be employed.

H_0: There is no autocorrelation problem in the model

H_1: There is autocorrelation problem in the model

$\alpha = 0.05$

Decision Rule: Reject H_0 if p-value less than significance level, otherwise accept H_0.

3.4.5. Multicollinearity

According to (Brooks, 2008). Multicollinearity will occur when some or all of the independent variables are highly correlated with one another. If the multicollinearity occurs, the regression model is unable to tell which independent variables are influencing the dependent variable. The consequences of Multicollinearity are large variances and covariance of OLS estimators, wider confidence interval, insignificant t ratio, high R^2 but few significant t ratio, sensitivity of OLS

estimators and their standard errors to small changes in data. There is no one unique method to detect the multicollinearity problem, it only have some rules of thumb, which are high R^2 but few significant t ratio, high pair wise correlation coefficient and Variance Inflation Factor (VIF) or Tolerance. This study will use high pair-wise correlation coefficients method to test the presence of multicollinearity problem in a regression model. Because it can see the correlation of independent variables between each other one by one. If the correlation coefficient is higher than 0.8, the model would be considered as it consists of serious Multicollinearity problem (Joseph, 2003).

3.4.6. Normality

Normality tests are used to determine if a data set is well-modeled by a normal distribution. With the normality assumption, ordinary least square estimation can be easily derived and would be much more valid and straightforward. This study will use JarqueBera Test (JB test) to find out whether the error term is normally distributed or not. The hypothesis for the normality test was formulated as follow:

H_0: Error term is normally distributed

H_1: Error term is not normally distributed

$\alpha = 0.05$

Decision Rule: Reject H_0 if p-value of JB test less than significance level, otherwise accept H_0.

3.5. Model Specification

According to (Brooks, 2008). Specification error occurs when omitting a relevant independent variable, including unnecessary variable or choosing the wrong functional form, so that regression model will be wrongly predicted. If the omitted variable is correlated with the included variable, the estimators are biased and inconsistent. If the omitted variable is not correlated with the included variable, the estimators are unbiased and consistent. Ramsey RESET test will be used to see whether the developed model is correctly regressing.

H_0: the model is correctly specified

H_1: the model is not correctly specified

$\alpha = 0.05$

Decision Rule: Reject H_0 if p-value is greater than significance level. Otherwise, accept H_0.

3.6. Ethical Considerations

In this research study, issues relating to the ethical conduct of research such as informed consent, confidentiality and privacy was upheld. According to (Cooper, 2003).Ethics is the norms or standards of behavior that guide moral choices about our behavior and our relationships with others. In addition, the goal of ethics in research is to insure that no one is harmed or suffers adverse consequence from research activity. Participants and respondents will be given full information on the purpose and objectives of the study in order for them to make informed decisions. Moreover, all information concerning the identity and personality of respondents will be treated with utmost confidentiality. Additionally, all information gathered will be used for the sole purpose of this research study.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4. Introduction

This chapter covers the presentation, analysis and interpretation of data collected from primary sources. A total of 97 questionnaires were distributed to Employees of Heineken Ethiopia operating companies, located in Addis Ababa, Bedele and Harar respectively, to assess Factors Influencing ERP implementation in Heineken Ethiopian operating companies.

Out of the 97 questionnaires distributed 86 were properly filled and usable for further analysis.

This chapter presents the descriptive analysis on variables of the study and results of regression analysis that constitute the main findings of this study. All the data were coded and entered in to

SPSS version 20 as well as EViews 9 and inferences were made based on the statistical results.

4.1. Reliability and Validity

A reliability test is used to assess consistency in measurement items. If a research tool is consistent, stable, predictable and accurate, it is said to be reliable. The greater the degree of consistency and stability in an instrument, the greater its reliability. (Bhattacherjee, 2012) defined reliability as the degree to which the measure of a construct is consistent or dependable. Internal consistency reliability test was used to determine reliability of the questionnaire by calculating Cronbach's Alpha which is used to measure the internal consistency of the measurement items. If a coefficient alpha is between 0.6 and 0.7 it indicates that there is fair reliability, Higher Alpha coefficients indicate higher scale reliability (Joseph, 2003).

As shown in table below scale reliability Cronbach Alphas coefficients for top management Support is .831, project team competency is .803, user training and education is .823, interdepartmental communication is .839, business process reengineering is .837, Consultant involvement is .824 and ERP implementation evaluation is .805. This study also demonstrates high internal consistency and the total Cronbach Alpha coefficient is .845. Therefore, this study demonstrates high reliability.

Validity refers to the extent of which a test measures what we actually wish to measure. The questionnaire was adapted from other research paper by (Selvakumar Swaminathan, 2011).

Pilot testing allow to assess the question's validity and the likely reliability of the data (Ranjit, 2011). It also enables the researcher to know whether the design of data collection instruments is successful in meeting the research objectives and in obtaining meaningful responses. In line with the above assumption pilot test was conducted and this validation was made regarding the reliability of the questioners' through the use of Cronbach's Alpha. Subsequently, when the pilot test was successful the researcher proceeded with the final distribution of the questioner.

Table 4.1 shows the reliability test Cronbach's Alpha coefficients for Assessment of ERP in the case of Heineken Ethiopian operating companies. The Cronbach's Alpha coefficients of the variables range from 0.803 to 0.839. And the overall Cronbach's Alpha coefficient for expected-scale items is 0.845. Based on the examination of the research scales and constructs, it can be concluded that each variable represents a reliable and valid construct.

Table 4.1 Reliability Test (Cronbach's Alpha)

Dimensions	**Cronbach's Alpha coefficients**
Top Management Support	.831
project team competency	.803
user training and education	.823
Interdepartmental communication	.839
business process reengineering	.837
Consultant involvement	.824
ERP Implementation Evaluation	.805
Reliability of Total Scale	**.845**

Source: Analysis of Survey data 2017, using SPSS 20

4.2. Demographic Characteristics of Respondents

As shown in table 4.2 below that majority of the respondents are male which accounts for 58% or more than half of the total respondents while the rest 28% are female.

The majority of respondents are less than 30 years of age, which accounts to 58.1% of the total respondents. The other 36% of the respondents falls between 30 and 40 age group category and the remaining 5.8% fall under 40 and 50 years between. This result indicates that there are more young employees' in the organization which during implementation could have a positive result during training, coping up with organizational change and creating a fluent communication among departments.

The academic qualification of the respondents' shows that majority of the employees 8.1% hold their Diploma, 77.9% hold bachelor degree and the rest 14% hold master's degree. The academic qualification of respondents is expected to enhance the quality of the data as they are likely to understand the questioner and forward their view fairly accurately.

Table 4.2 Demographic characteristics of respondents

Category	Item	Frequency	Percent
Gender	Male	58	67 %
	Female	28	28%
	Total	**86**	**100%**
Age	Less than 30 years	50	58.1%
	Between 30 and 40 years	31	36%
	Between 40 and 50 years	5	5.8%
	Total	**86**	**100%**
Qualification	Diploma	7	8.1%
	Degree	67	77.9%
	Masters	12	14%
	Total	**86**	**100%**

Source: Analysis of Survey data 2017, using SPSS 20

4.3. Factors Influencing ERP implementation in Heineken Ethiopian Branch

The different factors that can affect usage of implementation of ERP in Heineken Ethiopian branch Top Management Support, Project Team Competency, User Training and Education, Interdepartmental Communication, Business Process Reengineering and Consultant Involvement have been stated in the literature review and were analyzed as presented here below.

4.3.1 Top Management Support

For exploring the role of top management in ERP implementation project in Heineken Ethiopia the researcher provided 7 (as shown in table 4.3) questions and offered these questions to all users of ERP. The final result showed that the mean of top management support is 1.9402 and the standard deviation is 0.55240. This means that top management had an appropriate support of ERP implementation regarding allocation of resource, delegation of authority, and motivation of employees. Overall, top management has played an instrumental role in the implementation process. The result obtained above was consistent to previous studies of (Huang, 2010), (Joycelyn L. Harrison, 1997), which considers TMS is one of the most important factors for success of ERP implementation.

As Table 4.3 shows most of the respondents was satisfied with all questions related with support of top management. When asked if they agree that top management has allocated all the required resources (time, budget and money) for ERP implementation 51.2% of the respondents agreed and when asked if top management has delegated implementation authority for project managers 51.2% were agreed.In addition when they were further asked if top management has understood the objectives of ERP 45.3% were agreed, when asked if top management had a good knowledge of ERP 48.8% were agreed, when asked if top management had taken a self-motivated role in leading the ERP implementation 54.7% were agreed, when asked if top management had taken all the necessary risk and responsibilities during ERP implementation 54.7% were agreed and when finally asked that if top management has set official policies 53.5% were agreed. From the above responses it can be seen that top management Support has been constantly recognized as the most vital and crucial success factor in ERP system implementation.

Table 4.3 Summary of Survey Findings for Top Management Support

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Remark
Top management has allocated all the required resources (time, budget and money) for ERP implementation	36%	51.2%	12.8%	0%		**Agree**
top management has delegated implementation authority for project managers.	33.7%	51.2%	14%	1.2%		**Agree**
Top management has understood the objectives of ERP.	39.5%	45.3%	10.5%	4.7%		**Agree**
Top management had a good knowledge of ERP.	22.1%	48.8%	23.3%	5.8%		**Agree**
Top management had taken a self-motivated role in leading the ERP implementation	25.6%	54.7%	17.4%	1.2%	1.2%	**Agree**
Top management had taken all the necessary risk and responsibilities during ERP implementation.	25.6%	54.7%	16.3%	3.5%		**Agree**
Top management has set official policies.	19.8%	53.5%	23.3%	3.5%		**Agree**

Source: Analysis of Survey data 2017, using SPSS 20

4.3.2 Project Team Competency

For investigating project team competency six questions were designed to all users of ERP. As represented in Table 4.10, the mean value 1.9864 for this variable showed that project team was competent. This means the project was composed of skilled, qualified and experienced people who had a good knowledge in business and technical aspects. The result concurs with results of a research done by (Joycelyn L. Harrison, 1997). (Emad Abu-Shanab, 2015), who showed PTC is one of the most important factor for successful ERP implementation. The low value of standard

deviation, 0.54964 indicates a low dispersion of data and a consensus among the respondents on the mean.

As Table 4.4 shows majority of the respondents was satisfied with all questions related to project team competency. The respondents were asked if the team members were skilled or qualified 59.3% were agreed, the respondent also asked if The ERP project has been the top and only priority for the team 58.1% were Agreed, the respondent further asked that if the team members had a knowledge of the key issues relating to ERP implementation 61.6% were Agreed. when asked if the project team had experienced in previous ERP implementations 55.8% were Agreed, when asked if The team members had business and technical knowledge 51.2 were Agreed, when Finally asked if The team members has carefully been selected based on their knowledge and ability to accept change 46.5% were Agreed. From the above responses it can be seen that Project Team.

Table 4.4 Summary of Survey Findings for Project Team Competency

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Remark
The team members were skilled or qualified.	27.9%	59.3%	10,5%	2.3%		**Agree**
The ERP project has been the top and only priority for the team.	24.4%	58.1%	14%	3.5%		**Agree**
The team members had a knowledge of the key issues relating to ERP implementation	20.9%	61.6%	14%	3.5%		**Agree**
The project team had experienced in previous ERP implementations.	23.3%	55.8%	18.6%	2.3%		**Agree**
The team members had business and technical knowledge	25.6%	51.2%	23.3%			**Agree**
The team members has carefully been selected based on their knowledge and ability to accept change	24.4%	46.5%	23.3%	5.8%		**Agree**

Source: Analysis of Survey data 2017, using SPSS 20

4.3.3 User Training and Education

In order to study user training and education factor the researcher designed eight questions (see table 4.5) to all of the ERP users. The final result showed that the mean of this variable is 1.9331 and the standard deviation is 0.40661. The mean value indicates that organization wide training program with appropriate training materials which targets on the entire business process and ERP application was designed and provided by highly qualified trainers. This result is also supported by other researchers like (Emad Abu-Shanab, 2015)**,** (Severin V. Grabski, 2011) and (AL-Sabaawi, 2015) **w**hich considers UTE is one of the most important critical success factor for ERP implementation.

As Table 4.5 shows majority of the respondents was satisfied with questions related to user training and education. The respondents were asked if the Organization has provided all resources required for training 67.4% were Agreed, when asked if the Training programs were properly and well designed for end-users 69.8% were Agreed, the respondent further asked if the Training materials (manual) have been customized for each specific Jobs 67.4% were Agreed, when asked that if An organization-wide training program has been placed and all employees where involved 72.1% were Agreed, when asked if the Training materials target the entire business task not only the ERP screen and reports 76.7% were Agreed, when asked if Enough time was allocated for ERP. Training 80.2% were agreed, when asked if the Training material had been built by Heineken functional Experts 70.9% were agreed, and finally the respondent asked if Training program was handled by highly qualified consultants and trainers 69.8% were agreed. Therefore, from the above responses it can be concluded that User Training and Education support successful implementation of ERP and also helps employees of the company to understand the system in easy way.

Table 4.5 Summary of Survey Findings for User Training and education

	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Remark**
Organization has provided all resources required for training.	25.6%	65.1%	5.8%	3.5%	0%	**Agree**
Training programs were properly and well designed for end-users.	19.8%	69.8%	5.8%	4.7%		**Agree**

Training materials (manual) have been customized for each specific Jobs.	24.4%	67.4%	3.5%	4.7%		**Agree**
An organization-wide training program has been placed and all employees where involved	15.1%	72.1%	7%	5.8%		**Agree**
Training materials target the entire business task, not only the ERP screen and reports	12.8%	76.7%	7%	3.5%		**Agree**
Enough time was allocated for ERP training.	11.6%	80.2%	5.8%	2.3%		**Agree**
Training material had been built by Heineken functional Experts	24.4%	70.9%	4.7			**Agree**
Training program was handled by highly qualified consultants and trainers	20.9%	69.8%	5.8%	3.5%		**Agree**

Source: Analysis of Survey data 2017, using SPSS 20

4.3.4 Interdepartmental communication

For investigating interdepartmental communication five questions were designed for all ERP users. As represented in Table 4.10, the mean value 1.9884 for this variable showed that interdepartmental communication was effective. This means regular cross functional meeting was set to share new methods of working and collect improvement suggestions. IT staffs also fully support users. This result is also supported by other researchers like (Emad Abu-Shanab, 2015), which considers IC is one of the most important factors for success implementation. The low value of standard deviation, 0.44495 indicates a low dispersion of data and a consensus among the respondents on the mean.

As Table 4.6 shows most of the respondents was satisfied with questions related to interdepartmental communication. The respondents were asked that if there were regular cross functional meeting to discuss about the ERP 73.3% were Agreed, when asked if There were regular internal group meeting to share new method of using ERP 81.4% were Agreed, when asked if ERP improvement suggestions had been regularly collected from multiple employees levels 73.3%were

Agreed, when asked IT staff fully support all functional users during ERP implementation 72.1% were Agreed, when the respondent Finally asked that Communication team was set to solve the departmental Conflicts that arise during the implementation 76.7%were Agreed. From the above Responses it can be seen that IC is a crucial factor while implementing of ERP.

Table 4.6 Summary of Survey Findings for Interdepartmental communication

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Remark
There were regular cross functional meeting to discuss about the ERP	17.4%	73.3%	4.7%	4.7%	0%	**Agree**
There were regular internal group meeting to share new method of using ERP.	12.8%	81.4%	3.5%	2.3%		**Agree**
ERP improvement suggestions had been regularly collected from multiple employees levels	15.1%	73.3%	4.7%	7%		**Agree**
IT staff fully support all functional users during ERP implementation	22.1%	72.1%	3.5%	2.3%		**Agree**
Communication team was set to solve the departmental Conflicts that arise during the implementation	10.5%	76.7%	4.7%	5.8%	2.3%	**Agree**

Source: Analysis of Survey data 2017, using SPSS 20

4.3.5 Business Process Reengineering

BPR factor was investigated by four questions and all users of ERP answered these questions. The mean value for this variable is 1.9564 and it indicates the execution of BPR in terms of business process modification and organizational structure change was strong in ERP implementation project in Heineken. The result of this study is supported by other researchers like (Aamir Ijaz, 2014) and (Severin V. Grabski, 2011)which considers BPR is one of the most important factor for ERP implementation success.

As Table 4.7 shows most of the respondents was satisfied with questions related to BPR. The respondent where asked that if some business processes have been modified to fit the ERP

applications 80.2% were Agreed, when asked if Limited amendments have been done on the system 81.4% were Agreed also when asked if Changes in organizational structure have been done smoothly 82.6% were Agreed finally when the respondent asked that if Specialized consultations have been utilized successfully to change the existing processes 79.1% were Agreed. From the response it can be seen that BPR is one of the Main factors while implementing ERP.

Table 4.7 Summary of Survey Findings for Business Process Reengineering

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Remark
Some business processes have been modified to fit the ERP applications	9.3%	80.2%	4.7%	5.8%	0%	**Agree**
Limited amendments have been done on the system	15.1%	81.4%	3.5%			**Agree**
Changes in organizational structure have been done smoothly	14%	82.6%	3.5%			**Agree**
Specialized consultations have been utilized successfully to change the existing processes	12.8%	79.1%	5.8%	2.3%		**Agree**

Source: Analysis of Survey data 2017, using SPSS 20

4.3.6 Consultant involvement

Five questions were designed to assess the role of consultants in ERP implementation. As it's observed in Table 4.10 the mean value of this dependent variable is 1.9186 which proves the great performance of consultants during different stages of ERP implementation. This study is also supported by other researchers like (Joycelyn L. Harrison, 1997) which considers CI is one of the most important factors for successful ERP implementation.

As Table 4.8 shows majority of the respondents was satisfied with questions related to BPR. The respondents were asked that if consultants had in-depth knowledge of software 57% were Agreed, when asked if Consultant had involved in different stages of implementation 61.6% were Agreed, when asked if Consultants had multiple skills covering functional, technical, business knowledge 57% were Agreed, when asked if Consultant had given quick response when error arose after go-live 54.7% were Agreed when finally the respondent asked that if Consultant were able to quickly

respond for any problem 54.7% were Agreed. From the response it can be seen that CI is the crucial factors while implementing ERP.

Table 4.8 Summary of Survey Findings for Consultant involvement

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Remark
Consultants had in-depth knowledge of software	26.7%	57%	15.1%	1.2%		**Agree**
Consultant had involved in different stages of implementation	24.4%	61.6%	14%			**Agree**
Consultants had multiple skills covering functional, technical, business knowledge	26.7%	57%	15.1%	1.2%		**Agree**
Consultant had given quick response when error arose after go-live	25.6%%	54.7%	16.3%	3.5%		**Agree**
Consultant were able to quickly respond for any problem	29.1%	54.7%	12.8%	3.5%		**Agree**

Source: Analysis of Survey data 2017, using SPSS 20

4.4. ERP Implementation Evaluation

The mean value of ERP users' response to ten questions which are designed to measure the success of ERP implementation is 1.8477. This indicates overall implementation is successful and it improves productivity, operational efficiency, customer satisfaction, financial visibility and control.

As Table 4.9 shows majority of the respondents was satisfied with questions related to ERP implementation evaluation. When the respondent asked that overall ERP implementation was successful 57% were Agreed, when asked ERP implementation has realized the expected benefits to the business 60.5% were agreed, when asked Heineken productivity is improved after using ERP 61.6%, were Agreed, when asked Business operational efficiency has been improved after using ERP 65.1% were Agreed, when asked Business processes have been updated through use of ERP 68.6% were agreed, when asked ERP allows for better control of business operating expenses 62.8% were Agreed, when asked The financial visibility has been improved after implementing

ERP 62.8%where Agreed, when asked ERP is integrated in the whole business process 59.3% were Agreed, ERP has improved customer satisfaction 62.8% were Agreed when the respondent finally asked ERP system is easy to operate and user friendly 60.5% were Agreed from the response it can be seen that the respondent Agreed that the overall ERP implementation were successfully and effectively implemented.

Table 4.9 Summary of Survey Findings for ERP Implementation Evaluation

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Remark
Overall, ERP implementation was successful.	34.9%	57%	8.1%	0%	0%	**Agree**
ERP implementation has realized the expected benefits to the business.	26.7%	60.5%	12.8%			**Agree**
Heineken productivity is improved after using ERP	25.6%	61.6%	12.8%			**Agree**
Business operational efficiency has been improved after using ERP	23.3%	65.1%	11.6%			**Agree**
Business processes have been updated through use of ERP	24.4%	68.6%	5.8%	1.2%		**Agree**
ERP allows for better control of business operating expenses	26.7%	62.8%	10.5%			**Agree**
The financial visibility has been improved after implementing ERP	22.1%	62.8%	15.1%			**Agree**
ERP is integrated in the whole business process	30.2%	59.3%	10.5%			**Agree**
ERP has improved customer satisfaction	20.9%	62.8%	14%	2.3%		**Agree**
ERP system is easy to operate and user friendly.	32.6%	60.5%	7%			**Agree**

Source: Analysis of Survey data 2017, using SPSS 20

4.5. Mean and Standard Deviation of Variable

Table 4.10 implies mean scores and deviations from the mean towards the different variable (Top Management Support, project team competency, user training and education, Interdepartmental communication, business process reengineering, Consultant involvement, ERP Implementation Evaluation).

The code between one and two indicate a view of strongly agree and agree response consecutively. The variation from the mean further indicates the result could not vary significantly from the mean indicating the overall result still has a positive response regarding the parameters assessed. The average Sensitivity regarding the selected variables had a mean score that ranges between 1.9884, and 1.8477 respectively; with a standard deviation ranging from 0.40661 and 0.56433 respectively. Indicating the variation from the mean is small. The result also implies that the respondents have a positive view regarding the variables raised on the questioner. The variation from the mean further indicates the result could not vary significantly from the mean indicating the overall result regarding the parameters considering the variation still has a positive response from the respondents.

Table 4.10 Mean and Standard Deviation of Variable

S.N.	Item	Mean	Standard Deviation
1	Top Management Support	1.9402	0.55240
2	project team competency	1.9864	0.54964
3	user training and education	1.9331	0.40661
4	Interdepartmental communication	1.9884	0.44495
5	business process reengineering	1.9564	0.34766
6	Consultant involvement	1.9186	0.56433
7	ERP Implementation Evaluation	1.8477	0.43433

Source: Analysis of Survey data 2017, using SPSS 20

4.6. Classical Linear Regression Model Assumptions

As mentioned in the methodology part of this study, as far as the assumptions of classical linear regression model hold true, the coefficient estimators of both α (constant term) and β (independent variables) that are determined by ordinary least square (OLS) will have a number of desirable properties, and usually known as Best Linear Unbiased Estimators (BLUE). Hence, the following sections discuss results of the diagnostic tests (i.e., heteroscedasticity, autocorrelation, multicollinearity, normality and model specification test) that ensure whether the data fits the basic assumptions of classical linear regression model or not.

4.6.1 Heteroskedasticity

When the scatter of the errors is different, varying depending on the value of one or more of the independent variables, the error terms are heteroskedastic Brooks (2008). Heteroscedasticity test is very important because if the model consists of heteroskedasticity problem, the OLS estimators are no longer BEST and error variances are incorrect, therefore the hypothesis testing, standard error and confident level will be invalid. An ARCH test has been made, to ensure that this assumption is no longer violated. The hypothesis for the heteroskedasticity test was formulated as follow;

H0: There is no Heteroscedasticity problem in the model

H1: There is Heteroscedasticity problem in the model

α = 0.05

Decision Rule: Reject H_0 if P value is less than significant level 0.05. Otherwise, accept H_0.

Table 4.11 Result of Heteroskedasticity Test: ARCH Test

ARCH Test	P-Value
F-statistic	0.3895
Obs*R-squared	0.3698

Source:Own computation, using EViews 9

As shown in the above table, all versions of the Arch test statistic (F-statistic and Chi-Square) gave the same conclusion that there was no evidence for the presence of heteroscedasticity in this particular study. Since the p-values of 0.3895and 0.3698 for F-statistic and Chi-Square respectively were in excess of 0.05, the null hypothesis should be accepted.

4.6.2 Autocorrelation

It is assumed that the distribution errors are uncorrelated with one another and that the errors are linearly independent of one another. Autocorrelation error occurs when there is a serial correlations between residuals and their own past values. In this study, BreuschGodfrey Serial Correlation LM Test is used to carry out the autocorrelation test. The p-value is obtained to examine whether the autocorrelation problem occurs in the model. If the p-value is more than 5% significant level, it implies that there is no autocorrelation problem in the model. The hypothesis for the model specification test was formulated as follow:

H0: There is no autocorrelation problem in the model

H1: There is autocorrelation problem in the model

$\alpha = 0.05$

Decision Rule: Reject H_0 if P value is less than significant level 0.05. Otherwise, accept H_0.

Table 4.12 Autocorrelation Test: BreuschGodfrey Serial Correlation LM Test

Arch Test	P-Value
F-statistic	0.7494
Obs*R-squared	0.7254

Source:Own computation, using EViews 9

From the above table, it can be concluded that this research accepted the null hypothesis (H0), since the p value for both F-Statistic and Chi-Square is 0.7494 and 0.7254, which is greater than significance level of 0.05. Thus, it can be concluded that the model does not consist of autocorrelation problem.

4.6.3 Multicollinearity

According to Brooks (2008), multicollinearity will occur if some or all of the independent variables are highly correlated with one another. It shows the regression model has difficulty in explaining which independent variables are affecting the dependent variable. If multicollinearity problem is too serious in a model, either additional important variable should be added or unimportant independent variable should be dropped. This study uses high pair-wise correlation coefficients method to detect the existence of multicollinearity high pair-wise correlation coefficients method see the correlation of independent variables between each other one by one. According to Guajarati

(2004), if the correlation coefficient is higher than 0.8, it is considered as the model consists of serious multicollinearity problem

Table 4.13 Multicollinearity Test: High Pair-Wise Correlation Coefficients

	TMS	TRAINING	CONSULTANT	COMMUNICATION	CAPABILITY	BPR
TMS	1.000000	0.372957	0.377767	0.311678	0.543462	0.323185
TRAINING	0.372957	1.000000	0.406677	0.509365	0.582628	0.345837
CONSULTANT	0.377767	0.406677	1.000000	0.342895	0.499586	0.455406
COMMUNICATION	0.311678	0.509365	0.342895	1.000000	0.413053	0.414969
CAPABILITY	0.543462	0.582628	0.499586	0.413053	1.000000	0.386789
BPR	0.323185	0.345837	0.455406	0.414969	0.386789	1.000000

Source: Own computation, using EViews 9

The table above shows that there is no strong pair-wise correlation between the independent variables (Top Management Support, project team competency, user training and education, Interdepartmental communication, business process reengineering, Consultant involvement). As a rule of thumb, inter-correlation among the independent variables above 0.80 signals a possible multicollinearity problem. In this study the correlation coefficient is below 0.80 between the independent variables. Thus, it can be concluded that all variables have low correlation power; as a result there is no multicollinearity problem in the independent variables.

4.6.4 Normality

Normality test is used to determine whether the error term is normally distributed. Brooks (2008) noted that the Jarque-Bera statistic would not be significant for disturbance to be normally distributed around the mean. The purpose of the Jarque-Bera test is to make sure that the data set is well-modeled by a normal distribution. The hypothesis for the normality test was formulated as follow:

H0: Error term is normally distributed

H1: Error term is not normally distributed

$\alpha = 0.05$

Decision Rule: Reject H0 if p-value of JB test less than significance level, otherwise accept H0.

Table 4.14 Normality Test: Bera-Jarque Test

	Probability (P-Value)
JarqueBera Test	0.516430

Source:Own computation, using EViews 9

The above table indicates that the Jarque-Bera statistic has a P-value of 0.516430 implies that the p-value for the Jarque-Bera test is greater than 0.05 which indicates that there was no evidence for the presence of abnormality in the data. Thus, the null hypothesis that the data is normally distributed should be accepted since the p-value was considerably in excess of 0.05.

4.6.5 Model Specification

Model specification error occurs when omitting a relevant independent variable, including unnecessary variable or choosing the wrong functional form. When the omitted variable is correlated with the variable, which included the estimators will be biased and inconsistent and model specification error will tends to occur. If the omitted variable is not correlated with the included variable, the estimators are unbiased and consistent and model specification error will not occur. Therefore, in order to select a correct estimated model, the researcher had carry out the Ramsey-RESET Test to check on the model specification. The hypothesis for the model specification test was formulated as follow;

H0: the model is correctly specified

H1: the model is not correctly specified

$\alpha = 0.05$

Decision Rule: Reject H0 if p-value is greater than significance level. Otherwise, accept H0.

Table 4.15 Model Specification Test: Ramsey-RESET Test

	Test Statistic Value
Ramsey-RESET test	Prob. F Test = 0.2451

Source:Own computation, using EViews 9

From the above table, it can be concluded that this research accepted the null hypothesis (H0), since the p value is 0.2451, which is greater than significance level of 0.05. Thus, it can be concluded that the model specification is correct.

4.7. Hypothesis Testing Using Multiple Regressions

The study aims to investigate the relationship between the independent variables top management support, project team competency, user training and education, interdepartmental communication, business process reengineering, consultant involvement with the dependent variable ERP Implementation Evaluation in Heineken Ethiopian operating companies.

Since correlation analysis do not provide enough information to make a proper decision regarding the relationships between the variables, multiple regression has been used to test the hypothesis for the independent and dependent variables. This section discusses in detail the analysis of the results for each independent variable and their significance in ERP implementation success. Furthermore, the discussion analyzes the statistical findings of the study in relation to the previous empirical evidences. The result for each set of factors is discussed in this section of the research.

To test the relationship between the independent variables and dependent variable the following linear regression model was developed.

$$ERS = \beta 0 + \beta 1\ TMS + \beta 2\ PTC + \beta 3\ UTE + \beta 4\ IC + \beta 5\ BPR + \beta 6\ CI + \varepsilon$$

The definition of all individual variables included in the above equation is discussed in the methodology part of the study.

Table 4.16 Multiple regression results

Independent Variable	Coefficient Value	P-Value	Sign
Top Management Support (TMS)	0.173438	0.0032	+
project team competency (PTC)	0.268992	0.0001	+
user training and education (UTE)	0.235948	0.0133	+
Interdepartmental communication (IC)	0.143419	0.0485	+
business process reengineering (BPR)	0.169558	0.0040	+
Consultant involvement (CI)	0.241340	0.0001	+

R-squared	0.658065
Adjusted R-squared	0.632095
F-statistic	25.33966
Prob(F-statistic)	0.000000

Source:Own computation, using EViews 9

In the above table 4.8 the regression model presents how much of the variance in ERP implementation success is explained by the underlying factors. The predictor variables in this model have accounted for 65.8% of the variability. This means more than 65.8% of variations in factors affecting implementation of ERP in Heineken Ethiopia operating companies were explained by independent variables included in the model. However, the remaining 34.2% variation in implementing ERP in Heineken Ethiopia operating companies is not included in this model.

The overall significance or acceptability of the model from a statistical perspective can be measured using the significance value of F statistic (.0000), which is less than $p<0.05$, the model is significant. This indicates that the variation explained by the model is not due to probability and is valid.

4.7.1 Top management Support in Implementation of ERP

Hypothesis testing of the relationship between top management supports (TMS) and ERP implementation success.

H0: Top management support does not have a significant effect on the success of ERP implementation.

H1: Top management support affects significantly and positively the success of ERP implementation.

Conclusion: Reject H0 since there is a positive significant relationship between top management supports (TMS) and ERP implementation success. The E-view result on the above table, table 4.16, showed that the coefficient of top management supports (TMS) is positive. According to the regression result beta is 0.173438 and is significant (0.0032).

This result also confirms with previous researches by (Huang, 2010) and (Joycelyn L. Harrison, 1997)that state top management support to be influential in the implementation of ERP. This

finding implies that top management support is one of the critical success factor for the successful implementation of ERP in Heineken Ethiopia operating companies. Having a top management support ensures success of ERP implementation by providing leadership and necessary resources and making relevant decisions.

4.7.2 Project team competency in Implementation of ERP

Hypothesis testing of the relationship between project team competency (PTC) and ERP implementation success.

H0: Project team competency and capability does not have a significant effect on the success of ERP implementation.

H1: Project team competency and capability affects significantly and positively the success of ERP implementation.

Conclusion: Reject H0 since there is a positive significant relationship between project team competency (PTC) and ERP implementation success. The E-view result on the above table, table 4.16, showed that the coefficient of top management supports (TMS) is positive. According to the regression result beta is 0.268992 and is significant (0.0001).

This result also confirms with previous researches by (Joycelyn L. Harrison, 1997) and (Emad Abu-Shanab, 2015) that state project team competency to be an influential in the implementation of ERP This finding could imply that project team competency is one of the critical success factor for the successful implementation of ERP in Heineken Ethiopia operating companies.Competent project team commits personnel that only focus on the project and promotes organizational support by organizing the implementation process. In addition it also monitor activities to ensure that the stated objectives of ERP implementation projects are achieved.

4.7.3 User training and education in Implementation of ERP

Hypothesis testing of the relationship between user training and education (UTE) and ERP implementation success.

H0: User training and education does not have a significant effect on the success of ERP implementation.

H1: User training and education affects significantly and positively the success of ERP implementation.

Conclusion: Reject H0 since there is a positive significant relationship between user training and education (UTE) and ERP implementation success. The E-view result on the above table, table 4.16, showed that the coefficient of user training and education (UTE) is positive. According to the regression result beta is 0.235948 and is significant (0.0133).

This result also confirms with previous researches by (Emad Abu-Shanab, 2015), (Severin V. Grabski, 2011) and (AL-Sabaawi, 2015) that state User training and education to be one of the influential factor in the implementation of ERP. This finding could imply that User training and education is the critical success factor for the successful implementation of ERP in Heineken Ethiopia operating companies. User training and education helps ERP users to be aware of ERP logics and concept and be a familiar with features of the system. This as a result enables the company to obtain the most benefit from ERP.

4.7.4 Interdepartmental communication in Implementation of ERP

Hypothesis testing of the relationship between Interdepartmental communication (IC) and ERP implementation success.

H0: Interdepartmental communication does not have a significant effect on the success of ERP implementation.

H1: Interdepartmental communication affects significantly and positively the success of ERP implementation.

Conclusion: Reject H0 since there is a positive significant relationship between Interdepartmental communication (IC) and ERP implementation success. The E-view result on the above table, table 4.16, showed that the coefficient of Interdepartmental communication (IC) is positive. According to the regression result beta is 0.143419 and is significant (0.0485).

This result also confirms with previous researches by (Emad Abu-Shanab, 2015)that state Interdepartmental communication to be influential in the implementation of ERP. This finding could imply that Interdepartmental communication is one of the critical success factor for the

successful implementation of ERP in Heineken Ethiopia operating companies. Effective interdepartmental communication allows the organization's stakeholders to understand the goal and the expected benefits of the project as well as to share the progress of the project. As a result all organization's stakeholders would be able to know what is expected from them and committed for it.

4.7.5 Business process reengineering in Implementation of ERP

Hypothesis testing of the relationship between Business process reengineering (BPR) and ERP implementation success.

H0: Business process reengineering does not have a significant effect on the success of ERP implementation.
H1: Business process reengineering affects significantly and positively the success of ERP implementation.
Conclusion: Reject H0 since there is a positive significant relationship between Business process reengineering (BPR) and ERP implementation success. The E-view result on the above table, table 4.16, showed that the coefficient of Business process reengineering (BPR) is positive. According to the regression result beta is 0.169558 and is significant (0.0040).

This result also confirms with previous researches by (Aamir Ijaz, 2014), (Severin V. Grabski, 2011) that state Business process reengineering to be influential in the implementation of ERP. This finding could imply that Top management support is one of the critical success factor for the successful implementation of ERP in Heineken Ethiopia operating companies. Business Process Reengineering which is strongly related with identifying existing business structure, process in the beginning of ERP project and relate this to the business process contained within ERP system helps the company to simplify the process, eliminate redundant activities and use all of the functionalities of ERP.

4.7.6 Consultant involvement in Implementation of ERP

Hypothesis testing of the relationship between Consultant involvement (CI) and ERP implementation success.

H0: Consultant involvement does not have a significant effect on the success of ERP implementation.

H1: Consultants involvement affects significantly and positively the success of ERP implementation.

Conclusion: Reject H0 since there is a positive significant relationship between Consultant involvement (CI) and ERP implementation success. The E-view result on the above table, table 4.16, showed that the coefficient of Consultant involvement (CI) is positive. According to the regression result beta is 0.241340 and is significant (0.0001).

This result also confirms with previous researches by (Joycelyn L. Harrison, 1997) that state Consultant involvement to be influential in the implementation of ERP this finding could imply that Consultant involvement is one of the critical success factor for the successful implementation of ERP in Heineken Ethiopia operating companies. Consultants can help in information system requirement analysis, risk management, business process reengineering (BPR) and also technical implementation knowledge. As a result consultants have enormous role from beginning to end in ERP implementation success.

Table 4.17 Comparison of the Test Result with the Expectation

Independent Variables	Expected Relationships with ERP implementation Evaluation	Actual result	Statistical Significance test	Hypothesis Status
Top Management Support	+	+	Significant at 1%	Failed to Reject
project team competency	+	+	Significant at 1%	Failed to Reject
user training and education	+	+	Significant at 1%	Failed to Reject
Interdepartmental communication	+	+	Significant at 5%	Failed to Reject
business process reengineering	+	+	Significant at 1%	Failed to Reject

Chapter Five

Conclusions and Recommendations

5.1. Conclusions

As discussed in the introduction and as it was shown through the statement of the problem and literature review, there isn't a research stream on ERP implementations for the case of Ethiopia particularly for the case of the beer sector. This research aims to fill this gap. Throughout the study all questions were answered and all hypotheses were tested and validated. The following are the main findings and results of the study;

- ✓ ERP system has been implemented successfully with relative weight 91.9%. This is very indeed indicator of success of ERP implementation for Heineken. Besides, the research revealed that in principle, international theoretical work on ERP implementations critical success factors can be fitted into the Ethiopian beer sector context. All six critical success factors that have been discussed in the international literature and it has also been found as a critical success factors in this study.
- ✓ Top management support has been found to be important factor of implementing successfully the ERP system. TMS is one of the important critical success factors. Top management in the Heineken operating companies in Ethiopia have set official policies and taken a self-motivated role in leading the ERP implementation. They have been committed to allocate all the required resources (time, budget and money) for ERP system implementation. Therefore, top management was greatly supporting its organization in ERP implementation processes by maintaining a financial plan and delegating implementation authority.
- ✓ Project team competency also plays a significant role to success the ERP implementation. The project team was composed of skilled employees with relevant experience in prior ERP projects. The team members has passed through different tests and interviews to check their knowledge and ability to accept change.
- ✓ User training and education were important to success of Heineken ERP implementation. This was one of main CSFs of ERP implementation. Heineken has focused on this factor during the implementation. The company has designed training materials that focuses on

both the entire business task and ERP features. Adequate training was provided for end users by allocating enough time and money. The training materials was developed and the training was provided by functional experts from external consultants and Internal Heineken staffs employed in different countries.

- ✓ Inter departmental communication were important to success of Heineken ERP implementation. ERP implementation project team in Heineken had built a communication team who would collect system improvement suggestions, support functional users and solve any departmental conflicts.
- ✓ Business process reengineering (BPR) has been found to be important factor of implementing successfully the ERP system. BPR is one of the important critical success factors. In order to fit the business process to ERP application modification has been done in some processes of the companies.
- ✓ Consultants has played a significant role in the success of the ERP implementation. The company has hired two consultant named CIMAC and Tectura who have in depth knowledge of the business and the system. The consultants have participated in different stages of ERP implementation.

5.2. Recommendations

As explained in this research, ERP systems are important and bring competitive advantages to organizations. ERP demand is also coming to many organizations in Ethiopia. So, the researcher recommends and suggests the following two main points.

- ✓ The second phase of upgrading the current ERP system in Heineken is planned to be done in 2018. Thus, the company can consider the success factors identified in this study as input to improve the second phase of the project.
- ✓ Other Ethiopian organizations specifically beer companies planning to implement ERP system can consider implementing all critical success factors identified in this study as input for managing their ERP project.

In order to improve success of future ERP implementation the researcher recommends the following points for each dependent variable.

- ✓ Top management of organization should strengthen supporting the project from the very beginning and should inform and motivate employees of the company in all stages of ERP implementation.
- ✓ Companies should strengthen providing training to the project team and users in order to increase their knowledge and expertise.
- ✓ Companies should have professionally, socially and personally competent project team.
- ✓ Companies should strengthen promoting transparent communication in ERP implementation.
- ✓ Companies should strengthen hiring competent consultant and allow them to involve in each stages of ERP implementation.

Further Research Recommendation

Based on the limitations encountered and the reported findings of this research it is necessary to provide several directions for further research. The following topics are recommended for further study.

- ✓ A study of the ERP projects implementation challenges and
- ✓ Impact of ERP on organizational performance with the use of structural equation modeling.

Bibliography

(http://www.tutorialspoint.com/management_concepts/images/enterprise_resource_planning.jpg, A. 2. (2016, 04). *http://www.tutorialspoint.com*. Retrieved from management_concepts/images/enterprise_resource_planning.

Aamir Ijaz, R. K. (2014). A Qualitative Study of the Critical Success Factors of ERP System.

Al-Mashari, M. A.-M. (2003). Enterprise resource planning. *European Journal of Operational research*.

AL-Sabaawi, M. Y. (2015). Critical Success Factors for Enterprise Resource planning Implimentation Success.

Barton. (2001). Enterprise Resource PlanningFactors Affecting Success and Failure.

Bhattacherjee, A. (2012). Social Science Research: Principles, Methods and Practices.

Bhatti, T. (2002). Critical Success factors for implementation OF Enterprise Resource Planning (ERP). In *The Second International Conference on Innovation in Information Technology,.* United Arab Emirates.

Bhatti, T. R. (2005). Critical Success Factors For The Implementation Of Enterprise Resource Planning (ERP. Dubai, UAE.

Bin Embong. (2008). "The Effectiveness of ERP Implementation in Manufacturing Industries".

Bingi, P. S. (1999). *Critical issues affecting an ERP implementation [Electronic version]. Information Systems Management*, 7-13.

Boo Young Chung. (2007). *An analysis of success and failure factors for ERP systems in engineering and construction firms*.

Bradford, M. (2000). The Implementation of Enterprise Resource Planning. *An Innovation Diffusion Approach*.

Brooks, C. (2008). *Introductory econometrics for finance.* 2nd ed. New York: Cambridge University Press.

Chen, I. (2001). planning for ERP systems: analysis and future trend. *Business Process Management Journal*, 374-86.

Chung, B. Y. (2007). An analysis of success and failure factors for ERP systems in engineering and construction firms.

Cooper, D. &. (2003). In *Business Research Methods.* (8th ed.). Boston: McGraw-Hill Irwin.

Davenport, T. H. (2000). Mission Critical. In *Realizing the Promise of Enterprise Systems, Harvard Business School Press.* Boston, MA: Harvard Business School Press,.

Derese. (2013). a study on Oracle ERP system at Ethio-Telecom.

Donovan, M. (2006). Successful ERP Implementation the First Time.

Donovan, M. (2008). The Effectiveness of ERP Implementation in Manufacturing Industries.

El-Kurd, A. A.-R. (2016). Critical Success Factors for ERP Implementation in UNRWA as a Case Study.

Emad Abu-Shanab, R. A.-S. (2015). Critical Success Factors for ERP Implementation.

Esteves, J. M. (1999). An ERP Life-cycle-based Research Agenda.

Finnery, S. &. (2007). ERP implementation: a compilation and analysis of critical success factors. *Business Process Management Journal*, 329-347.

Ford. S. (2010). Managing your Global Business with Cloud Technology. Financial Executive.

Fuβ, C. G. (2007). ERP Usage in Banking. *An Exploratory Survey of the World's Largest Banks", Information Systems Management*, 155-171.

Gargeya, V. B. (2005). Success and failure factors of adopting SAP in ERP system implementation. *Business Process Management Journal*, 11 (9).

Glaser, T. (1999). *System selection strategies for county governments*.

Holland, C. L. (1999). A critical success factors model for ERP implementation. *IEEE Software (May/June)*, 30–35.

Huang, Z. (2010). Completion Research of ERP implementation Critical Success Factors.

Ibrahim, A. (2010). What Organisations Should Know About Enterprise Resource Planning (ERP) System. Abu Dhabi.

Jarrar. Y. F., A.-M. A. (2000). ERP Implementation Critical Success Factors. In *The Role And Impact Of Business Process Management* (pp. 122-127).

Jose M. Esteves, J. A. (1999). An ERP Life-cycle-based Research Agenda.

Joseph, A. &. (2003). *Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales, Presentedat the Midwest Research-to-Practice Conference in Adult, Continuing,and Community Education*.

Joycelyn L. Harrison, A. (1997). Motivation for Enterprise Resource Planning (ERP) system Implementation . *in Public Versus Private sector organization*.

Kalpakjian, S., & Schmid, S. (2006). *Manufacturing engineering and technology.* Upper Saddle River, Prentice-Hall/Pearson Education.

Koch, C. (2006). *The ABC's of ERP.*

Kothari, C. R. (2004). *Research Methodology.* 2nd ed. New Delhi: New age international limited.

Lewis, D. (7/16/2001). Companies demand Payback – Top Execs Rein In CIOs.

Ngai, E. W. (2008). Examining the critical success factors in the adoption of enterprise resource planning. *Computers in Industry*, 548–564.

Petra T. (2007). fixed effects random effects dynamic panel data models. New York: Cambridge University Press.

Raafat George Saade, H. N. (2016). Critical success factors in enterprise resource planning implementation. *Journal of Enterprise Information Management*, Vol. 29 Iss: 1, pp.72 – 96.

Ranjit, K. (2011). *Reserch Methodology.* a step-by-step guide for beginners London: SAGE Publications Ltd.

Roberts, H. a. (1992). MRP II implementation key factors for success. *Computer Integrated Manufacturing Systems*, 31-8.

Rosario, J. (2000). critical success factors in ERP implementation projects.

Selvakumar Swaminathan. (2011). Critical Success Factors of ERP Implementation.

Severin V. Grabski, S. A. (2011). Risk and Controls In the Implementation of ERP system.

Sintayehu. (2014). Success Factors for Implementation of Enterprise Resource Planning System at Ethiopian Airlines.

Somers T.M., a. N. (2001). The Impact of Critical Success Factors across the Stages of Enterprise Resource Planning Implementations. *Proceedings of the 34th Hawaii International Conference on System Sciences*.

Sumner, M. (1999). Critical success factors in enterprise wide information management systems projects. *Proceedings of the Americas Conference on Information Systems (AMCIS)*, 232-4.

Themistocleous, M. I. (2001). ERP and application integration. *Business Process Management Journal*, 195-204.

Umble, E. a. (2002). Avoiding ERP implementation failure. *Industrial Management*, 44(1), 25(9).

Wee. (2000). Juggling toward ERP success: keep key success factors high.

Appendices

Appendix I: Questionnaire for Heineken Breweries S.C Employees

St. Mary University College

SCHOOL OF GRADUATE STUDIES

MBA- DEPARTMENT OF ACCOUNTING AND FINANCE

SURVEY QUESTIONNAIRE

This questionnaire is designed to collect first-hand information for a project conducted in partial fulfillment of Master Degree of Business Administration in Accounting and Finance under the title Assessment of ERP Implementation in the case of Heineken Breweries S.C (HBSC). The completion of the research substantially depends on your cooperation and of the information you give in this questionnaire. Furthermore, the information you provide will be solely used for academic purpose. Therefore you are requested to give a genuine response to the questions.

The survey will be confidential and will not be used for other purpose other than this paper. Thank you for taking your treasured time to fill out the questionnaire. I appreciate your collaboration in advance.

Section 1: Personal information:

1. Gender:

☐ Male ☐ Female

2. Age:

☐ Less than 30 years ☐ between 40 and 50 years

☐ Between 30 and 40 years ☐ between 50 and 60 years

3. Qualification:

☐ Diploma ☐ Masters

☐ Degree ☐ PhD

4. Designation/ Title _____**Department**: _____
Role: _____
_____

5. Since how many years have you been working with this organization?

☐ 0-1 Year ☐ 2-3 years

☐ 1-2 Years ☐ More than 3 Years

6. In which Heineken Field office you are working

☐ Head office Addis Ababa

☐ Harar

☐ Bedele

Section 2: Questions:

The research questions on these topics are operationalized through a series of statements, to which participants are required to respond using a five point format. 1 represent strongly agree, 2 represent agree, 3 represent neutral, 4 represent disagree and 5 represent strongly disagree.

1- **Top Management Support (TMS)**						
To **what extent do you agree on the following statements regarding top management support?**						
#	Item	1	2	3	4	5
1	Top management has allocated all the required resources (time, budget and money) for ERP implementation.					
2	Top management has delegated implementation authority for project managers.					
3	Top management has understood the objectives of ERP.					
4	Top management had a good knowledge of ERP.					

5	Top management had taken a self-motivated role in leading the ERP implementation.					
6	Top management had taken all the necessary risk and responsibilities during ERP implementation.					
7	Top management has set official policies.					

2- **Team Competency (capability)**						
To **what extent do you agree on the following statements regarding project team competences?**						
#	Item	1	2	3	4	5
1	The team members were skilled or qualified.					
2	The ERP project has been the top and only priority for the team.					
3	The team members had a knowledge of the key issues relating to ERP implementation.					
4	The project team had experienced in previous ERP implementations.					
5	The team members had business and technical knowledge					
6	The team members has carefully been selected based on their knowledge and ability to accept change.					

3- **User training and education**						
To **what extent do you agree on the following statements regarding users training and Education?**						
#	Item	1	2	3	4	5
1	Organization has provided all resources required for training.					
2	Training programs were properly and well designed for end-users.					
3	Training materials (manual) have been customized for each specific Jobs.					
4	An organization-wide training program has been placed and all employees where involved					
5	Training materials target the entire business task, not onlythe ERP screen and reports					
6	Enough time was allocated for ERP training.					
7	Training material had been built by Heineken functional Experts					
8	Training program was handled by highly qualified consultants and trainers.					

4- **Interdepartmental communication**						
To **what extent do you agree on the following statements regarding users training and Education?**						
#	Item	1	2	3	4	5
1	There were regular cross functional meeting to discuss about the ERP.					

2	There were regular internal group meeting to share new method of using ERP.					
3	ERP improvement suggestions had been regularly collected from multiple employees levels					
4	IT staff fully support all functional users during ERP implementation.					
5	Communication team was set to solve the departmental Conflicts that arise during the implementation.					

4- **BPR**						
To **what extent do you agree on the following statements regarding BPR?**						
#	Item	1	2	3	4	5
1	Some business processes have been modified to fit the ERP applications					
2	Limited amendments have been done on the system					
3	Changes in organizational structure have been done smoothly					
4	Specialized consultations have been utilized successfully to change the existing processes					

4- **Consultant**						
To **what extent do you agree on the following statements regarding Consultant?**						
#	Item	1	2	3	4	5
1	Consultants had in-depth knowledge of software.					
2	Consultant had involved in different stages of implementation.					
3	Consultants had multiple skills covering functional, technical, business knowledge					
4	Consultant had given quick response when error arose after go-live					
5	Consultant were able to quickly respond for any problem.					

5- **ERP Implementation Evaluation**						
To what extent do you agree on the following statements regarding the evaluation of ERP Implementation?						
#	Item	1	2	3	4	5
1	Overall, ERP implementation was successful.					
2	ERP implementation has realized the expected benefits to the business.					
3	Heineken productivity is improved after using ERP					
4	Business operational efficiency has been improved after using ERP					
5	Business processes have been updated through use of ERP					

6	ERP allows for better control of business operating expenses					
7	The financial visibility has been improved after implementing ERP					
8	ERP is integrated in the whole business process					
10	ERP has improved customer satisfaction					
11	ERP system is easy to operate and user friendly.					

Cronbach's Alpha Test

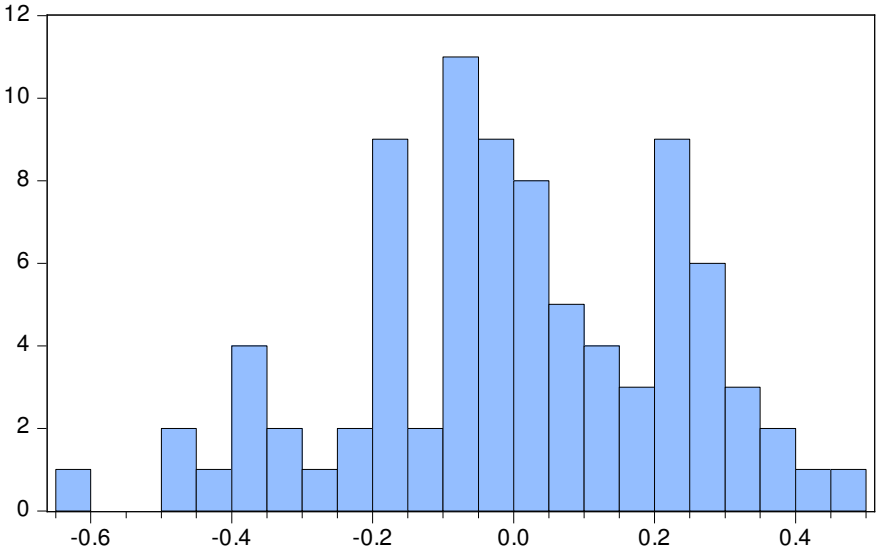
Cronbach's Alpha	No. of Items
.845	7

	Cronbach's Alpha
TMS	.831
capability	.803
training	.823
communication	.839
BPR	.837
Consultant	.824
Evaluation	.805

Multicollinearity

	TMS	TRAINING	CONSULTANT	COMMUNICATION	CAPABILITY	BPR
TMS	1.000000	0.372957	0.377767	0.311678	0.543462	0.323185
TRAINING	0.372957	1.000000	0.406677	0.509365	0.582628	0.345837
CONSULTANT	0.377767	0.406677	1.000000	0.342895	0.499586	0.455406
COMMUNICATION	0.311678	0.509365	0.342895	1.000000	0.413053	0.414969
CAPABILITY	0.543462	0.582628	0.499586	0.413053	1.000000	0.386789
BPR	0.323185	0.345837	0.455406	0.414969	0.386789	1.000000

4.3.1. Normality



Series: Residuals	
Sample 1 86	
Observations 86	
Mean	-3.75e-16
Median	-0.018600
Maximum	0.490546
Minimum	-0.622320
Std. Dev.	0.230886
Skewness	-0.265581
Kurtosis	2.705563
Jarque-Bera	1.321630
Probability	0.516430

4.3.2. Autocorrelation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.289577	Prob. F(2,77)	0.7494
Obs*R-squared	0.642018	Prob. Chi-Square(2)	0.7254

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 04/27/17 Time: 19:34
Sample: 1 86
Included observations: 86
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TMS	0.005650	0.058115	0.097229	0.9228
TRAINING	0.008633	0.086484	0.099823	0.9207
CONSULTANT	0.003738	0.058247	0.064167	0.9490
COMMUNICATION	-8.59E-05	0.072487	-0.001186	0.9991
CAPABILITY	-0.010409	0.069575	-0.149610	0.8815
BPR	-0.004341	0.091649	-0.047362	0.9623
C	-0.005495	0.175038	-0.031393	0.9750
RESID(-1)	0.013384	0.116075	0.115300	0.9085
RESID(-2)	0.087652	0.117182	0.748001	0.4567

R-squared	0.007465	Mean dependent var	-3.75E-16
Adjusted R-squared	-0.095655	S.D. dependent var	0.230886
S.E. of regression	0.241677	Akaike info criterion	0.096329

Sum squared resid	4.497388	Schwarz criterion	0.353179
Log likelihood	4.857855	Hannan-Quinn criter.	0.199699
F-statistic	0.072394	Durbin-Watson stat	1.989073
Prob(F-statistic)	0.999735		

Tests for the Heteroskedasticity Test: ARCH

Heteroskedasticity Test: White

F-statistic	1.082534	Prob. F(27,58)	0.3895
Obs*R-squared	28.81679	Prob. Chi-Square(27)	0.3698
Scaled explained SS	20.73675	Prob. Chi-Square(27)	0.7985

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 04/27/17 Time: 19:35
Sample: 1 86
Included observations: 86

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.361878	0.296896	-1.218869	0.2278
TMS^2	0.007467	0.025222	0.296051	0.7682
TMS*TRAINING	0.065070	0.096992	0.670875	0.5050
TMS*CONSULTANT	-0.062861	0.063823	-0.984930	0.3287
TMS*COMMUNICATION	-0.096599	0.057541	-1.678766	0.0986
TMS*CAPABILITY	-0.011833	0.062468	-0.189429	0.8504
TMS*BPR	-0.009454	0.082064	-0.115200	0.9087
TMS	0.211689	0.158998	1.331398	0.1883
TRAINING^2	0.042541	0.061336	0.693563	0.4907
TRAINING*CONSULTANT	-0.007690	0.068085	-0.112951	0.9105
TRAINING*COMMUNICATION	-0.032269	0.105229	-0.306652	0.7602
TRAINING*CAPABILITY	-0.123722	0.091321	-1.354804	0.1807
TRAINING*BPR	0.053589	0.122621	0.437027	0.6637
TRAINING	-0.074185	0.208809	-0.355274	0.7237
CONSULTANT^2	0.026744	0.028052	0.953382	0.3444
CONSULTANT*COMMUNICATION	0.040905	0.061216	0.668201	0.5067
CONSULTANT*CAPABILITY	0.021370	0.057616	0.370901	0.7121
CONSULTANT*BPR	0.137173	0.081988	1.673090	0.0997
CONSULTANT	-0.353113	0.162769	-2.169410	0.0342
COMMUNICATION^2	0.005583	0.050317	0.110955	0.9120
COMMUNICATION*CAPABILITY	0.052514	0.076402	0.687336	0.4946
COMMUNICATION*BPR	-0.141062	0.103515	-1.362723	0.1782
COMMUNICATION	0.353746	0.212717	1.662986	0.1017
CAPABILITY^2	0.045484	0.049627	0.916500	0.3632
CAPABILITY*BPR	-0.163104	0.109298	-1.492286	0.1410
CAPABILITY	0.231983	0.196913	1.178095	0.2436
BPR^2	0.065082	0.084315	0.771889	0.4433
BPR	0.000855	0.201150	0.004251	0.9966

R-squared	0.335079	Mean dependent var	0.052689
Adjusted R-squared	0.025547	S.D. dependent var	0.069213

S.E. of regression	0.068324	Akaike info criterion	-2.271866
Sum squared resid	0.270750	Schwarz criterion	-1.472777
Log likelihood	125.6903	Hannan-Quinn criter.	-1.950270
F-statistic	1.082534	Durbin-Watson stat	2.220790
Prob(F-statistic)	0.389539		

4.3.1. Model Specification

Ramsey RESET Test
Equation: UNTITLED
Specification: EVALUATION TMS TRAINING CONSULTANT COMMUNICATION CAPABILITY BPR C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.171066	78	0.2451
F-statistic	1.371396	(1, 78)	0.2451
Likelihood ratio	1.498913	1	0.2208

Regression Results

Dependent Variable: EVALUATION
Method: Least Squares
Date: 04/27/17 Time: 19:31
Sample: 1 86
Included observations: 86

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TMS	0.173438	0.057090	3.037990	0.0032
TRAINING	0.235948	0.093337	2.527912	0.0133
CONSULTANT	0.241340	0.056981	4.235464	0.0001
COMMUNICATION	0.143419	0.071562	2.004133	0.0485
CAPABILITY	0.268992	0.067431	3.989172	0.0001
BPR	0.169558	0.057288	2.959768	0.0040
C	0.323553	0.172223	1.878684	0.0640

R-squared	0.658065	Mean dependent var	1.679704
Adjusted R-squared	0.632095	S.D. dependent var	0.394844
S.E. of regression	0.239494	Akaike info criterion	0.057311
Sum squared resid	4.531215	Schwarz criterion	0.257083
Log likelihood	4.535642	Hannan-Quinn criter.	0.137710
F-statistic	25.33966	Durbin-Watson stat	1.958426
Prob(F-statistic)	0.000000		