

***IMPLEMENTATION OF ERP SYSTEM AND  
ASSESSMENT OF OPERATIONAL PERFORMANCE:  
A CASE STUDY ON 54 Capital Ltd Companies***

**By**  
**SOFONYAS BERHANU ALEMU**  
**ID.N. SGS/0027/2009B**

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***ST. MARY'S UNIVERSITY  
SCHOOL  
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**APPROVED BY BOARD OF EXAMINERS**

\_\_\_\_\_  
Dean, Graduate Studies

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\_\_\_\_\_  
Advisor

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\_\_\_\_\_  
External Examiner

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Internal Examiner

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Sofonyas Berhanu

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## LIST OF ACRONYMS

ERP	Enterprise Recourse planning
IT	Information Technology
FMCG	Fast Moving and Consumable Goods
OP	Operation Performance
CEO	Chief Executive Officer
SCM	Supply Chain Management
IS	Information System
MC	Management Control
SC	Share Company
MT	Metric Tone
SI	System implementers
MSs	Microsoft system
SH	Share holder
MNGT	Management
SO	System operator
SPSS	Statistical Package for Social Science
ROI	Return on Investment
UOM	Unit Of Measurements
RUR	Resource Utilization Rate
ISTT	Independent Sample T Test
CF	Customer focus
SM	Supplier Management
MS	Management support
PC	Process control

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## ABSTRACT

*This paper aimed at studying operation performance difference from implementing ERP in 54 Capital companies and describing stakeholder's perception about ERP. The researcher collected both primary and secondary data from the companies. Quantitative and Qualitative data on operational performance of the companies were collected from reports, and primary data were collected from 73 research participants using structured questionnaire on a range of different variables. The results of the descriptive analysis for the ERP construct items showed that improved performance, more than 110% increment of efficiency and Effectiveness were the major achievements based on their descriptive analyses results. The overall mean of the ERP construct was 3.57. The result showed that management support was the most dominant determinant of operation performance followed by supplier management of resource utilization. The result of the t test for comparing the mean difference in operation performance before and after ERP deployment showed that the operational performance of the companies was significantly higher after the deployment of ERP. The researcher recommends that identifying and understanding the operation processes strategies is necessary before ERP implementation. There is also clear indication of a positive relationship that an appropriate determinants of performance measurements is vital to the successfully use of ERP.*

**Keywords:** ERP system, Operation performance, Integration, Implementation, 54 capital companies, Addis Ababa, Ethiopia.

# CHAPTER ONE

## INTRODUCTION

### 1.1. Background of the study

In globalization and integrity economy era, globalization brings new event and head-to-head competition has highly emerging due to limited resource and variation on operation resource management system. Thus, companies are motivated for ways of taking competitive advantage against their competitors to maintain their market share and better operation efficiency and effectiveness. Every operational firms structured their technologies stands, operation strategy goals and advancement will make themselves better in comparative strategies. They must act promptly and make those changes to maintain their competitive advantage. Each organization needs to adopt a solution to face the change of time, the pressures on competitions are business driver for companies to implement new technologies, and one of these technologies could be Enterprise Resource Planning (ERP) systems.

ERP system is a set of commercial software packages and hardware that promise incorporated integration of information flow through all functional areas in a firm via providing them access to single database. The ERP software encompasses the best business practices which a firm can use to replace existing legacy systems. ERP systems are programs that intend to provide integrated software solution to handle multiple corporate functions including accounting and finance, human resources, manufacturing, materials management, and sales and distribution (Gyampah, 2007). One study found more than 60 percent of Fortune 500 companies had adopted ERP systems (G. Stewart et al, 2000).

The expansion in Information Technology (IT) and the increase in global business competition also forced organizations to find new ways of doing business. The need to improve information flow in organizations, reduce costs, streamline business processes, establish linkages with suppliers, satisfy customers, and also reduce response time to customer needs and expectations are some reasons behind the implementation of ERP in most organizations. According to Raabi (2009) Organizations require IT such as ERP, in order to remain successful and retain their competitiveness, further states that ERP systems may be the most important development in the corporate use of IT. Thus, many organizations are planning to improve their competitive position by implementing ERP systems. An enormous amount of money is usually invested in ERP projects as many organizations consider it as an opportunity for saving costs and increasing competitive advantage. A growing number of multinational enterprises are beginning to embrace ERP systems in the anticipation of increasing productivity and efficiency, and also as a means of leveraging organizational competitiveness (Ali, 2016).

ERP systems are cross-functional enterprise systems driven by an integrated set of software modules that maintain the central internal business processes of a company. The core function of ERP is to give decision makers an integrated real-time view of core business processes. These modules operate interactively utilizing one database, which shares all information necessary for each module's purpose, as well as user requirements.

ERP packages give a workflow engine to create automated work according to business rules and approval conditions so that information and documents can be moved to operational users for transactional conducts, and to managers for review and approval. Organizations now regard ERP as a vital tool for the enhancement of their mission, there are different benefits when companies deploying the system, According to (Lewis 2011) an integration of operation activities those, supply chain management, with production and sales and marketing activities with over all operation performance evaluation ,The ERP systems provides a sharper vision for the management supply chain which results in making those decisions that are more profitable in the Management Supply Chain ,also proved flexibility to changes can be transferred to other parts of the supply chain with updated way of system management and which also empowering technologies like the internet, extranet and so on in sharing the information.

In the traditional models, the flow of information, merchandise, and the financial exchanges are linear (from the manufactures to the suppliers and from sellers to the customers). With the advent of the internet as a major relational channel, there emerged a major review in the priorities of the trade strategic views and the models of the supply chain which were used up to that time. (Joyes 2000 and Turbum 2002). Therefore, ERP implementation has big role in doing the operation activity efficiently and effectively through integrated system. All business unit can understand each other easily and having common frame of reference for stakeholder's mission achievement.

## **1.2. Statements Of the Research Problem**

In Ethiopia several manufacturing companies had operating in different resources management system and evaluate their operation performance, and the result of using resources management system will describe the company efficient and effectiveness on their plan effectiveness, profitability, sustainability in the market and value on social responsibility etc. Operational firm's main target is developed operation strategies and process their activity based on their mission, to make profitable in operation rewarded, satisfying their customer and taking the corporate responsibility for public and government issues. Therefore, asking how the company is are going to achieve their operation strategies and how much is the impact using ERP in operating activity is the concern to do this study

54capital ltd FMCG companies (Astco and healthcare food manufacturers) has operate in Ethiopia in different FMCG producing and distribute to the local and foreign market for the last 15 years and above through traditional resource management system in different period of time and they use now ERP for the last 3 years and above and manage the company operation performance in different performance results. And the companies have two sessions when operating its operation with ERP and before adaption of ERP has two period starting from April 2015 *Company working procedure (Corporate It memo: refer BBI/2551/15, Date April 2015)*.

There are different researches conducted on ERP impact on different operation activities (Ali, I. (2016) ,Ahmad Rabaai, (2009), Noor Hazirah (2011)and those addresses a lot about in different companies stances, and conducted the research on financial institutions , manufacturing firms and addresses “ ERP implementation can create operational benefit for adopters as compared to non-adopters and it does offer strategies benefit” and shows different operational indicators based on application processes by the company stakeholder and how much ERP is relate on operation performance and how much degree have the impact on achievements of firms capabilities. While assessing the difference in operation performance when applying and non-applying period ERP in manufacturing industries specifically in FMCG companies are not shown. Therefore, this study is described how is the impact specifically operation processes for those FMCG companies of 54 capital when they deploying ERP according to their operation strategies.

Therefore, the research is assessing the difference on operation performance when applying the ERP system and pre-implementation. The study is addressing the following research questions:

- What is the relation between ERP application and operational performance?
- What difference is occurred when implementation of ERP on operation performance reward
- What impact have ERP in achieving operations strategies during pre and post implementation?
- What is the perception of stakeholder on implementation of ERP?

### **1.3. Objectives Of The Study**

#### **a) The general objective**

The main objective of this study is to identify the relationship between ERP system and operation performance,

#### **b) The specific objective**

According to Neely (2018) the main purpose of operation processes optimizing physical resources to assure efficiency and achieving the higher comparative advantage on operation cost and quality

(effectiveness and efficiency), therefore the purpose of this study is to describe the real impact on 54 capital companies when using ERP (Sage ACCPAC) on operation performance and to assess stakeholder's perception on the application of ERP impact on operation efficiency and effectiveness.

Specifically, the research answer:

- To assess the efficiency of operation when applying ERP,
- To describing the Effect of ERP on operation effectiveness on cost, quality and time
- To determine the impacts on customers satisfaction, and shareholder goal achievement
- To determine how much ERP implementation gives flexible for the change management
- How much vary on effectiveness on operation during implementation and non-implemented

#### **1.4. Research Hypothesis**

The main reason of developing hypotheses is in relation with try to put temporary answers or guess the research questions or the purpose of the study. The variables (dependent and independent) is be identified and defined in order to test the hypotheses. In this study the researcher used the following hypostase which try to answer/guess/ research question answerers basically alternative and null hypothesis are listed here:

- ✓ Alternative Hypothesis (H1): there is difference in the operational performance of companies when they use ERP system rather than the period none deployed.

#### **1.5. Scope and Limitation of the study**

This research examines the businesses activities of two companies of 54 Capital Ltd in terms of their operational performances after they implemented.

Operation processes has a lot of characteristic in a company and assessing all these characteristics may need a lot of resources therefore, the study scoped with 72 period secondary data of two factory operation performance. This study is considered only Effectiveness and efficiency of the factory operation (Manufacturing operation, sales and marketing and supply chain management, excluding financial and Administration operation performance). Even though there are different factors affect the operation performance, while in this research study is consider only to see the ERP impact.

## **1.6. Significance of the study**

The beneficiary of the research will be primarily for those investors or owner applying on the ERP system for the operation outcome and understand the impact on the operation performance after assessing and evaluating this research paper will be important in proposing some possible recommendations to the problems in the study area. And secondly for further study literature and or any assessment to take as reference bases.

## **1.7. Organization of the thesis**

The thesis have organized in Five different chapters and discussing all about ERP impact on operation performance, The second chapter is literature review and have the empirical and theoretical literatures and the concept of thesis study frame work , Chapter three is contain all about the research design and approaches to conduct the study what is the population and size the techniques and type of data usage and collection and technique of the system to analyses collected data from the research and mechanism of analyzing ,chapter four have data analysis and results : describing the results from the analyzing system describing the end result about impact of ERP on operation getting from the study through statistic briefing and the last chapter contain the recommendations and conclusion about the research results.

## **1.8. Definitions of terms.**

**Enterprise Resource Planning (ERP):** system or solution, integrated computer-based application used to manage internal and external resources.

**Operation activity:** is a process of all activity in converting input to output through different human and physical resources for the purpose of achieving the stakeholder strategies in specific period.

**Performance** is a set of financial and nonfinancial indicators which offer information on the degree of achievement of objectives and results (Lebans & Euske 2006 after Kaplan & Norton, 1992).

## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

#### 2.1. Introduction

This chapter tries to find and present a review of significant theoretical and empirical literature in relation to the research questions being analyzed. The purpose of this study is to determine the different impact of ERP implementation on operation performance during pre and post implementation. Different theories of ERP implementation process and approach and also operation performance in different business activity, there determinants for performance and relating with those staff working on operation processes is discussed on this chapter. The purpose of a literature review is to offer initiative to the reader what literatures describe and interpreting the research objective and formulate the research question in both theoretical and empirical forms, first We discuss the empirical evidence on operational performance and ERP and then the conceptual model used for the study and presented following the list of reviews made on previous and other related studies. Where the journals of authorities on the research subject is conducted as reference. It is also handling other areas of importance to the concepts of ERP and operational performance.

#### 2.2. Operational performance

As per Business dictionary (2018) operation performance is firm's performance measured against standard or prescribed indicators of effectiveness, efficiency, and environmental responsibility such as, cycle time, productivity, waste reduction, and regulatory compliance. An operation is the work of managing the inner workings of your business so it runs as efficiently as possible. Whether you make products, sell products, or provide services, every small business owner has to oversee the design and management of behind-the-scenes work (Küsel, 2017). Operational performance (OP) refers to the ability of a company in reducing management costs, order time, lead-time, improving the effectiveness of using raw material and distribution capacity (Heizer, 2008). OP has an important meaning to firms, it helps to improve effectiveness of production activities and to create high-quality products (Kaynak, 2008). Operational performance objectives are considered to apply to all types of operations. These all-pervasive operational performance objectives are quality, speed, dependability, flexibility and cost. Furthermore, they also provide the key energy for operations management tools and techniques, such as kanban, SPC, ERP, and just-in-time, all of which are focused on doing things better, faster, more efficiently, and more cheaply (Hazirah, 2011).



Operational performance improvement potential Bain's X-ray is geared to 10 performance levers that have proved valuable over many years. These levers are reducing procurement costs, optimizing production, optimizing distribution, optimizing after-sales service, reducing overhead costs, optimizing IT, reducing product complexity, reducing product costs, reducing working capital and optimizing capital expenditure (Bottcher, 2015).

### **2.2.1. Operational performance objectives**

Operational performance objectives are the areas of operational performance that a company tries to improve, in a bid to meet its corporate strategy. After defining its corporate strategy, a company will identify the relevant operational performance objectives to measure and configure the environment, to enable the objectives to be accomplished (LaMarco, 2018). According to Neely (2018) there are five main operational performance objectives: speed, quality, costs, flexibility, and dependability.

I.Speed-The objective of speed measures how fast a company can deliver its products and generates sales quotes. This objective will be concerned with such issues as the time that it takes to manufacture and process one or more products of the company or the time that it takes to research a new product and develop it.

II.Quality-Typically, quality is considered to measure how well a product conforms to certain specifications. However, it's more than that, according to Andy Neely. It's also how desirable the features of the product are; how reliable the product is; how durable it is; how easily it can be serviced; how well it performs its intended function; and, how much the customers believe in its value. All of these are relevant measures of quality.

III.Costs-This objective looks at how much variation there is in the unit cost of a product as measured by changes in a variety of factors, including the volume and the variety of the products. Products that feature a greater variety tend to sport lower volumes and higher unit costs and vice versa. Ultimately, this affects the price of the product, the costs of producing it, and the profits to be obtained from that product.

IV.Flexibility-Flexible operations are operations that can configure the product lines to deal with various requirements and to also adjust these product lines quickly to new requirements. The latter is also closely related to the speed objective. A company should be able to produce different quality product varieties and also adapt its operations to suit different market conditions and delivery schedules.

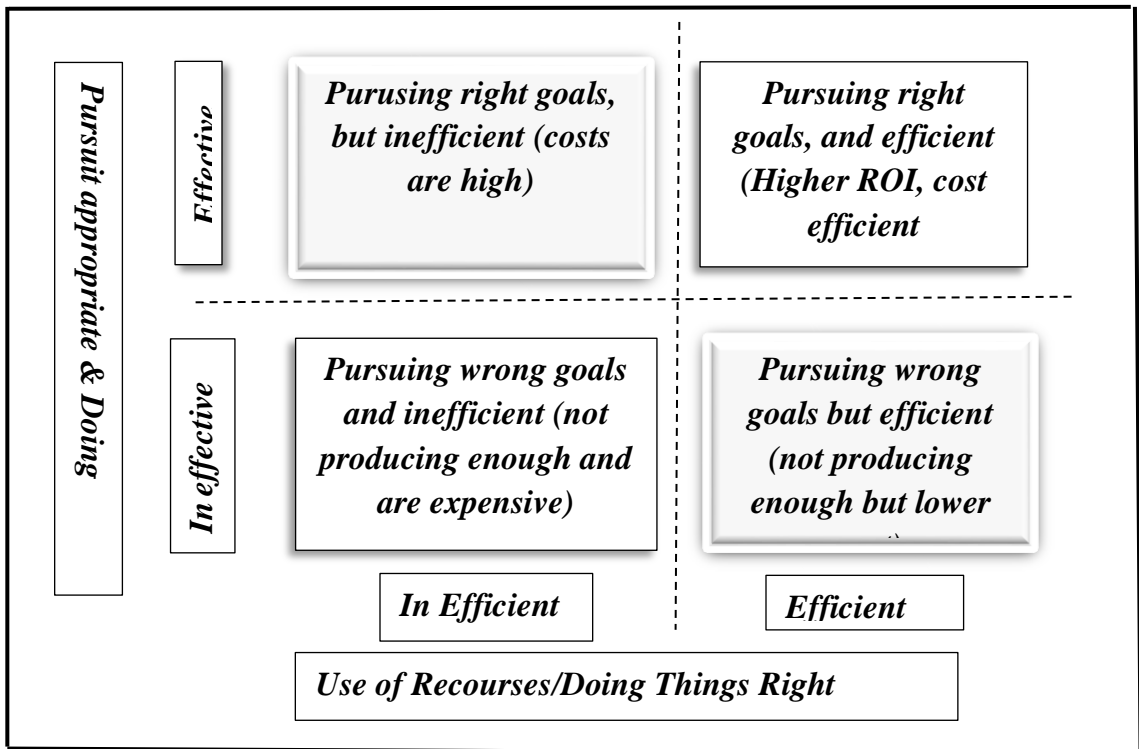
V. Dependability- This operational performance objective measures how dependable the company is when it comes to timely delivery of products to its customers, in accordance with planned prices and costs. The product’s ability to function in an intended way consistently over a reasonable period of time is also a measure of its dependability.

**2.2.2. Operation performance measurements**

According to J kyong (2018) operation performance measurements described broadly as operation efficiency and effectiveness in a day-to-day operation performance and summarized below.

- i. **Effectiveness:** Effectiveness is a non-quantitative concept concerned with achieving objectives, Effectiveness is ability to find those factors which help in achieving objectives. (Fraser, 1994)
- ii. **Efficiency:** Efficiency is a measure of whether the right amount of resources has been used to deliver a process, service or activity. Efficiency is not only reducing cost, increasing profit, diversifying business and fulfilling other business objective but it also includes maintaining quality, providing services and retaining customers. “Performing tasks with reasonable effort ‘doing things the right way (Fraser, 1994).

Table 2.1 Effectiveness against Efficiency



Sources: ‘Effectiveness vs. Efficiency’ Gareth Goh (2013, p: 21)

### **2.2.3. Operation performance determinants**

According to Hazirah (2011) operation performance is determined by Customer focus, Management support, supply chain management and processes control and improvement.

#### **2.2.3.1. Customer focus**

Customer focus is determination of customers' needs and wants. Information from customer is being used in designing products and services. Employees must have high commitment in understanding the products and services to satisfy the need and desire of customers. The implementation of customer focus practice helps companies to better understand customer expectations and market opportunities (Tan, 2002). Customer focus is considered as a key element for successful resources management system in the processes of development of new product and services, production, marketing, distribution and after-sales services through strong system based records on customer requirements of operation processes.

#### **2.2.3.2. Management support**

Top management can be defined as the highest-ranking executives (with titles such as chairman/chairwomen, chief executive officer, managing director, president, executive directors, executive vice-presidents, etc.) that have a responsibility toward the entire enterprise. Top management translates the policy into goals, objectives, and strategies, and projects a shared-vision of the future. It makes decisions that will affect everyone in the organization and holds the entire responsibility for the success or failure of the enterprise. According to (Abraham, 1999), the support of top management is the main motivation that drives companies toward an effective and successful implementation of effective objective achievements. According to Abraham (1999), the support of top management is the main motivation that drives companies toward an effective and successful implementation of operation capacity development practices. Top management support is essential to ensure that the necessary resources are provided to carry out market studies to determine customers' needs and requirements as well as making all efforts to meet them (Kaynak, 2008). Top management includes CEO and its direct subordinates responsible for corporate policy (Green, 1995).

#### **2.2.3.3. Process control**

Process control refers to the use of increasing processes outcome and designing process having the highest level of operation reward fulfillment (Forker, 1997). Operation reward is the outcome from the operation activities like: production volume- the capacity to produce with a given physical and human resources and selling or delivering to the market efficiently. It involves the use of fool-proof for process design, statistical techniques, automation and preventive equipment. According to Saraph (1989), clarifications

of work or process instructions can be identified easily when any problem occurred during or after the production. According to Ho (1999), the use of preventive equipment maintenance makes manufacturing process smoothly by improving reliability of equipment and restricting disruption in production.

The need for process improvement is apparent in all organizations (Kuula, 2012). Continuous process improvement reflects effective management processes which consist of measurement, analysis, and improvement (Ropret, 2012). Ensuring Operational Efficiency is a measure of task or a Job in operation processes. It is target of delivering superiority (product/service) to customers in the most efficient behavior through using better capacity and producing its product and deliver as demands of customer. Resource consumption, production, distribution and inventory. management are all common aspect of operational efficiency the effectiveness of a management process stems from the fact that personal experiences may overshadow the importance of performance information when making decisions or taking actions (Dobni, 2011; Fasil, 2011). Moreover, the pressure on good governance and accountability has resulted in the increasing use of performance measurement (Sciulli, 2009).

#### **2.2.3.4. Supplier management (Supply chain management) SCM**

Consists of assuring the quality of operation processes through supplying the demanded resources and using efficiently to the target of operation. Cooperation between a company and key suppliers is a basic and critical SCM practice. Buyers collaborate with suppliers to ensure that input materials meet standards and quality requirements in order to produce quality products (Chen, 2004). According to Flynn (1995), high-quality inputs that provided at the right time with the required quantity, helps firm to avoid downtime incidents, to reduce variance in processes and the rate of damaged materials. Moreover, effective supplier management can cut off inventory, waste and safety inventory level (Easton, 1998). When both parties in the supply chain interact, the supply chain relationship can be a partnership. Organizations are increasingly recognizing that an effective supply chain strategy can be a driver of long-term competitive advantage. Moreover, they are viewing supply chain strategy as an important element of overall business strategy (Qi, 2009) and as a means to responding in a timely manner to changing competitive conditions. Fisher (1997) has made the distinction between physically efficient and market responsive supply chain strategies. Physically efficient supply chains are those in which the primary objective is to minimize the physical costs associated with the production and delivery of goods with relatively predictable demand patterns.

In contrast, market responsive supply chains seek to minimize the market mediation costs associated with imbalances between supply and demand for products with highly unpredictable demand (Roh, 2014). More recently, Fisher's characterization has been recast in terms of lean supply chains that emphasize waste reduction, and agile supply chains that emphasize responsiveness to changing market conditions (Qi, 2009). Despite the significant body of research on supply chain management, there is little research that explicitly examines the relationship between a buyer's supply chain strategy and its suppliers' tactics, and the performance implications for the buyer (Arlbjørn, 2013). Supplier selection and buyer-supplier engagement influence buyer performance (Kannan, 2006). How effectively a supplier can serve a buyer is, however, predicated on the buyer having a clear strategic focus with respect to its suppliers, and suppliers being equipped to perform accordingly. Koufteros (2012). The link between a firm's strategic supply chain focus and the actions of its suppliers is thus an important one. The successful implementation of supplier management ensures that input materials meet standards and quality requirements in order to produce quality product (Chen, 2004). High quality inputs provided at the right time with the required quantity will help firms to avoid downtime incidents, to reduce variance in processes and the rate of damaged materials (Arif-Uz Zaman, 2014).

## **2.3. Enterprise Resource Planning (ERP)**

### **2.3.1. Concepts of Enterprise resource planning (ERP)**

Enterprise Resource Planning (ERP) is an integrated management tool in the form of software packages which are implemented in organizations to integrate all the existing organizational systems and functions ( Bhat et al, 2012). As per the professional blog (2008) Enterprise resource planning (ERP) is an enterprise-wide information system designed to coordinate all the resources, information, and activities needed to complete business processes such as order fulfillment or billing. An ERP system supports most of the business system that maintains in a single database the data needed for a variety of business functions such as Manufacturing, Supply Chain Management, Financials, Projects, Human Resources and Customer Relationship Management.

ERP originally referred to how a large organization planned to use organizational wide resources. In the past, ERP systems were used in larger more industrial types of companies. However, the use of ERP has changed and is extremely comprehensive, today the term can refer to any type of company, no matter what industry it falls in. In fact, ERP systems are used in almost any type of organization – large or small.

ERP is not simply a software but an approach to do a business operation efficiently and effectively and in this modern era technology plays a critical role in making an organization a success story or failure.

According to (Martin et al., 1999). An ERP software system can be also described, a set of integrated business applications, or modules, to carry out most business functions, including inventory control, general ledger accounting, accounts payable, accounts receivable, material requirements planning, order management and human resources, among others" ERP is a technique to bring all of an organization's data and IS /IT resources under a single Information system (Oliver, 1999). The author affirms that "ERP systems evolved to help organizations manage their information throughout the Company, from the plant to the back office, and or the front office." (Oliver, 1999, p. 12).

### **2.3.2. How ERP can improve a company's operation performance?**

As per the professional blog (2008) ERP's best hope for demonstrating value is as a sort of battering ram for improving the way your company takes a customer order and processes it into an invoice and revenue—otherwise known as the order fulfillment process. That is why ERP is often referred to as back-office software. It doesn't handle the up-front selling process (although most ERP vendors have developed CRM software or acquired pure-play CRM providers that can do this); rather, ERP takes a customer order and provides a software road map for automating the different steps along the path to fulfilling it.

### **2.3.3. Implementation of an ERP System**

As per the professional blog (2008) Implementing an ERP system is not an easy task to achieve, in fact it takes lots of planning, consulting and in most cases 3 months to 1 year +. ERP systems are extraordinary wide in scope and for many larger organizations can be extremely complex. Implementing an ERP system will ultimately require significant changes on staff and work practices. While it may seem reasonable for an in-house IT staff to head the project, it is widely advised that ERP implementation consultants be used, due to the fact that consultants are usually more cost effective and are specifically trained in implementing these types of systems. One of the most important traits that an organization should have when implementing an ERP system is ownership of the project. Because so many changes take place and its broad effect on almost every individual in the organization, it is important to make sure that everyone is on board and will help make the project and using the new ERP system a success. Usually organizations use ERP vendors or consulting companies to implement their customized ERP system. There are three types of professional services as per the professional blog (2008) that are provided when implementing an ERP system, they are Consulting, Customization and Support.

- Consulting Services – usually consulting services are responsible for the initial stages of ERP implementation, they help an organization go live with their new system, with product training, workflow, improve ERP's use in the specific organization, etc.
- Customization Services – Customization services work by extending the use of the new ERP system or changing its use by creating customized interfaces and/or underlying application code. While ERP systems are made for many core routines, there are still some needs that need to be built or customized for an organization.
- Support Services- Support services include both support and maintenance of ERP systems. For instance, trouble shooting and assistance with ERP issues.

#### **2.3.4. Advantages/disadvantage of ERP Systems**

Some organization are able to reap the true benefits of ERP whereas on the other hand majority of the firms face losses and failed to achieve the desired level of strategic and tactical benefits. (Scott and Vessey, 2002). Hence it is important for researcher to unlock the mystery of benefit realization in ERP adoption and theorize the important predictors' effect on ERP implementation practice (Brown and Vessey, 2003). Other than strategic benefit, ERP also contributes toward making an organizational structure flatter and more flexible, enabling organization to streamline their management structures and more democratic organization. On the other hand, it also involves the centralization of control over information and the standardization of processes, which are attributes more consistent with hierarchical command and control organization with uniform cultures (Davenport, 1998). There are many advantages and disadvantages on processes of implementing an EPR system as per the professional blog (2008); here are a few of advantages:

- A totally integrated system
- The ability to streamline different processes and workflows
- The ability to easily share data across various departments in an organization
- Improved efficiency and productivity levels
- Better tracking and forecasting
- Lower costs
- Improved customer service

Usually implementing new system face reset to change and those Challenges can be minimizing if adequate investment is made and adequate training is involved, however,

success does depend on skills and the experience of the workforce to quickly adapt to the new system, as per the professional blog (2008); the following are disadvantages:

- Customization in many situations is limited
- The need to reengineer business processes
- ERP systems can be cost prohibitive to install and run
- Technical support can be shoddy
- ERP's may be too rigid for specific organizations that are either new or want to move in a new direction in the near future.

### **2.3.5. ERP Implementation Approach**

When manufacturing companies begin looking at doing an ERP implementation, one of the first questions that needs to be answered after determining which application you will use, is what approach you will take to govern that ERP implementation. Although there is a fairly static set of steps that will need to be taken to successfully implement your ERP system, the approaches you can take to do this are not one and the same. Essentially, the two main approaches companies tend to use to govern an ERP implementation fall under one of two categories: Waterfall methodology and Agile development (Charleston, 2016).

- The Waterfall approach is so named because under this approach, each step is supposed to flow seamlessly to the next, like water cascading over a waterfall. In reality, an ERP implementation is a complex project that doesn't always follow a linear progression. The unexpected sometimes occurs, and requirements can change. However, the idea behind Waterfall is that there are certain steps that always need to happen on an ERP implementation – the Waterfall methodology addresses these. The ERP implementation steps required under the Waterfall methodology include: Discovery: Discovery typically begins during the sales process, and as the name implies, it involves the discovery of what business needs your ERP system will need to address and what you hope to achieve through your ERP implementation.
- Planning: Planning begins during the discovery phase and continues throughout the whole project. The planning phase involves identification of a project team, meetings with key stakeholders on the project, and documentation that outlines current issues and potential solutions. The outcomes of these meetings and documents will be a project plan that guides the project until it is complete. Design: In the Design phase, the solutions proposed in the Planning phase will be fleshed out. The project team will determine what specific components will be implemented and how they will be configured and used. The project team will also define roles of people involved in the project and



document the procedures and methodologies that will be used throughout the ERP implementation process.

- **Development:** In Development, the actual nitty-gritty technical work of the ERP implementation process will get underway. The project team will begin preparing for “go-live” by developing the necessary customizations to ensure the applications will work as needed when go-live day comes. Preparing users by providing training, and preparing the data in your current system to be imported into the ERP application are also important milestones that happen during development. **Testing:** Of course, you want to be sure things work before you go live, so all development work must be tested to ensure it is working properly. As problems are found, they will be addressed and everything will be fine-tuned. The project team users will also get their first peek at how the new system works.
- **Deployment:** Go-live, or deployment, happens when all development and testing is complete and problems have all been addressed. The ERP implementation team will make a decision as to whether the system is ready for go-live. The final data will be loaded into the ERP system, with one last check to uncover any problems. Usually, deployment happens over the weekend so as to reduce impact on users and customers. Following a successful go-live, the project team will train users as they begin working in the new system. **Support:** Just because the system has gone live doesn’t mean your project is over. The system will need support to ensure it continues to meet business needs as requirements change. Updates, upgrades and maintenance of the software will also be required on an ongoing basis.
- **Agile Methodology: A Sprint to the Finish;** The Waterfall approach outlined above was once used on most ERP implementation projects. Over the last 10 to 15 years, however, a new methodology that recognizes the difficulty of managing technology projects over longer periods of time in an environment of change has come to the fore. This methodology is called Agile development, or the Agile methodology, and it has started to replace the Waterfall approach on many ERP implementation projects. Like Waterfall, Agile development requires a great deal of requirements gathering early in the project, and these requirements are used to guide the project plan. However, what Agile projects do with this information and how the project is managed through the Development and Deployment process is somewhat different. Rather than completing all the work in a linear progression prior to testing, Agile divides the project plan into short intervals called sprints. Testing occurs at the end of each sprint, and adjustments are made accordingly, rather than spending a great deal of time doing development for the entire project and only discovering and addressing issues late in the game. Agile, as its name suggests, allows project teams to respond more quickly to

issues and changes as the ERP implementation project progresses. It does not assume that the project environment will remain static.

## **2.4. Stakeholders and perception**

Stakeholder is a person, group or organization that has interest, concern in an organization, can affect and be affected by the organization action, objectives and policies. Stakeholder is the member of the group without whom or who support the organization would cease to exist. They are party with most direct and obvious interest of stake in business decisions (Nagrani. 2017)

Stakeholder in business organization are all staff involving in the specified organization strategic or goal achievements with their responsibility according to their capacity and scope and they have controlling mandate which means Management control (MC) and ERP has control activities and According to (Jurje Cuppen, 2016) 'relation of ERP and Management control': In general, ERP systems are seen as technologies for MC (Dechow and Mouritsen, 2005). Granlund and Mouritsen (2003) argue that there is a relation between ERP and MC. ERP enables the running of MC, but it may also limit the design and implementation of MC systems. ERP and MC cannot be seen apart from each other, because ERP systems are centrally managed and are built around business processes (Granlund and Mouritsen, 2003). According to (Nagrani. 2017) the following are the types of stakeholders-

- Primary stakeholders are usually internal stakeholders who engage in economic transaction with the business for instance- creditors, suppliers, employees and customers.
- Secondary stakeholders are the ones which are external stakeholders who don't although engage in economic exchange with the business but are affected by or affects its actions. Example -general public, community, business support group, activist group and media etc.
- Excluded stakeholders are those who don't have any economic impact on business.

In software engineering, stakeholders have been defined as the people and organizations affected by the application [Conger, 1994] and as the people who have a stake or interest in the project [Cotterell and Hughes, 1995]. In other words, stakeholders are people or organizations who will be affected by the system and who have a direct or indirect influence on the system requirements [Sommerville and Kotonya, 1998]. The major stakeholder groups for an ERP project are Project Owners / Managers, Customers, Developers, Regulators, End Users, Domain Experts, other Integrated Systems, Vendors. Stakeholder Saliency: Stakeholders and Relationship Attributes. Mitchell et al. (1997) introduced the concept of Stakeholder Saliency. Stakeholder Saliency is the degree of importance or priority given by the project management to the claims made by the stakeholders or stakeholder groups. They

proposed a theory of stakeholder identification and salience based on the stakeholders possessing one or more relationship attributes i.e. power, urgency and legitimacy. They suggested that stakeholder attributes are variable, dynamic and socially constructed. In other words, the degree of each attribute is a result of multiple perceptions and may not be objective in nature (Sathish et al., 2003). The project management heeds to the stakeholders whose claims are perceived to be more salient in terms of power, legitimacy and urgency (Agle and Mitchell, 1999; Mitchell et al., 1997).

54 capital company members have practices of using different ERP software in different countries and time moreover, Ethiopian companies like ASTCO and health care food manufacturers are selected and use Sage 50 and changed the version to Sage 300 and now for expecting better performance evaluation and facilitation which is suited to each business operation. Sage 300 ERP is the name for the mid-market Sage ERP line of enterprise management and accounting applications (formerly Sage 50 ERP ACCPAC), primarily serving small and medium-sized businesses system provides flexible, integrated client/server and mainframe-based business applications software that was compatible with most popular hardware, software, and database platforms at the time.

## 2.5. Conceptual framework of the study

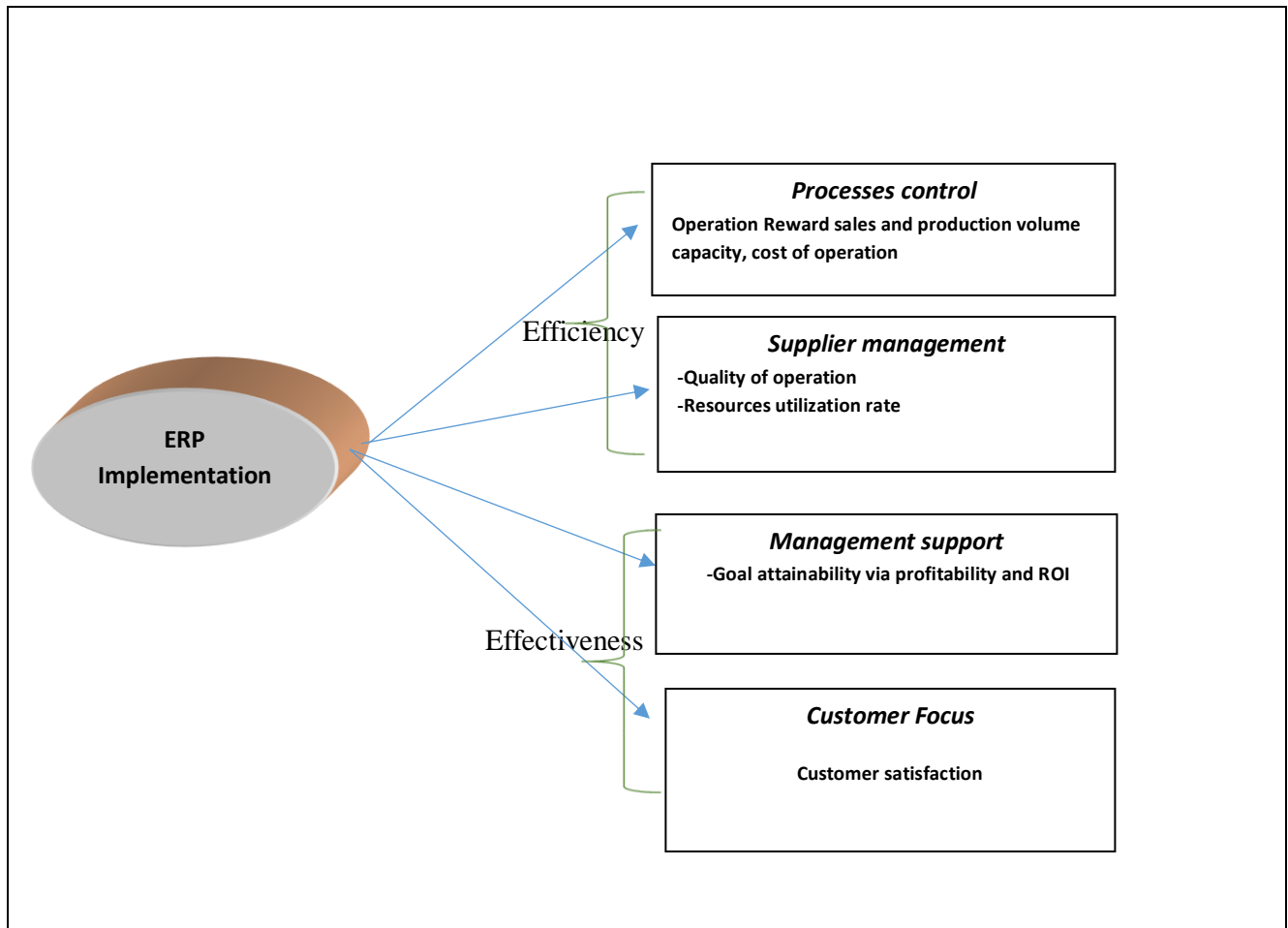


Figure 2.1: Assessment of ERP Implementation on operation performance difference

Source: Determinants of operation performance (Hazirah, 2011, p.03)

As discussed on the literature review: Implementation and management of resources management systems such as ERP have an effect on operation activities. Operation performance involves long-term planning that may include, products sourcing or supply chain management, processes control and improvements, managements support and customer relationship management (Hazirah, 2011). A firm's ability to have information readily available helps them achieve competitive advantage and strategic initiatives. The concept of receiving timely feedback, analyzing deviations from expectations and taking necessary decisions to correct deviations is rooted in cybernetic control theory (Green and Welsh 1988).

According to Vancouver (1996) successfully implemented ERP system will able to support the operation activity through less costly processes converting input to output and easily to improvement and innovation , flexible strategic for operation process ,cop up to change based on customer demand and Speedy deliver

the targeted on internally and externally requests ,qualifying minimum and international standards for competitive advantage and dependable on strategies system and trust on operation system objectively. According to Nelly (2018) all this system implementation measurements are led by management control, managements are stakeholder for operational activities and new system implementation. According to Kiyong (2001) the whole operation performance measurements is all about the effectiveness and efficiency of each operation activity.

## CHAPTER THREE

### RESEARCH DESIGN AND METHODOLOGY

#### 3.1. Background of the company

54capital An Africa-focused asset Manager Company which operate in different African country and in Ethiopia the company has more than seven independent entities formed by Ethiopian investor and creating as a joint venture formation with 54 capital ltd. From those company owned by 54capital; Astco food complex factory SC and healthcare food manufacturer SC is the targeted companies conducting the research how the they are operating their activity through ERP and what impact has occur when they are deploying ERP and for the period non-deploying the system. Both company Actco and Health care operating in FMCG sector and the Companies are operating for the last 10-15 years. And operating ERP for the last three years since April2015, in Sage Software (ACCPAC) in a different version for all their operation activities (supply chain management, marketing and sales, production and technique, quality assurance and Finance and Administration)

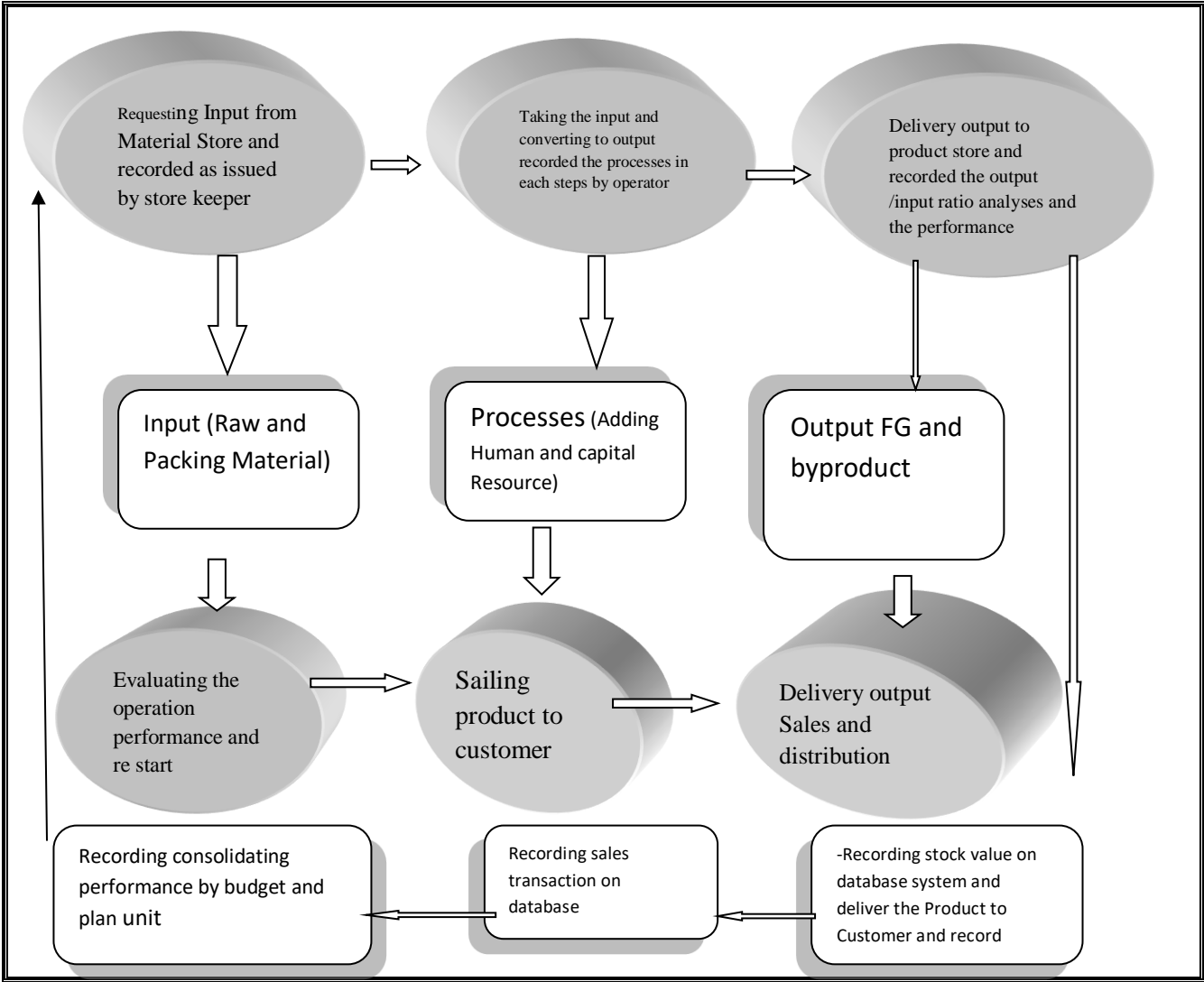
**ASTCO Food Complex Factory S.C** is Food manufacturing and distributing company Established in August 20, 1997 GC. With an initial Capital of birr 50 million by two brother hood shareholders (owners)& started operation on April 2004 G.C. with privet limited formation, and on April 2015 reestablished with five shareholders including three international investor and become share company formation, the total area of land occupied by the company is 12,000M<sup>2</sup>&AkakeKality area and warehouse 2,780 M<sup>2</sup>. The main purpose of the company is manufacturing & distributing (selling) of wheat flour, pasta, macaroni and other related food products for local market.

- ✚ Production Lines & Capacity-The Company has equipped with new and modern three major production lines.
- ✚ BUHELER machine which is made by Switzerland and has a daily attainable production capacity of 1,200 quintals of wheat flour
- ✚ PAVAN machine which is made by Italy and has a daily attainable production capacity of 288 Quintal of pasta.
- ✚ FAVA machine which is made Italy and a daily produced 220 quintals.

**Healthcare food manufacturer** is also food manufacturing and distributing company Established in September 2003 GC. With an initial Capital of birr 28 million by local owners & started operation with privet limited formation, and on April 2015 reestablished with five shareholders including three

international investor and become share company formation. The main purpose of the company is manufacturing & distributing (selling) of edible oil, fortified supplement foods and other related for local and foreign market. The company has equipped with new and modern three major production lines they have capacity of producing 85 hectoliter oil and 2MT supplement foods per day.

Figure 3.1. Company Operation flow and record



In this operation processes the company adopt ERP system starting from 2015GC initial which start Sage 50 and after a year upgraded the version to Sage 300 ACCPAC and all the above operation activities are done through the system for the last three years.

### 3.2. Research Approach and Design

In both company ASTCO Food Complex Factory S.C and Health Care Food Manufacture S.C there is independent operation activity even if the management system is integrated or lead by the group company 54 Capital the performance activities and evaluation are done and reporting by independent stakeholders, therefore ERP implementation impact can show independently and the research designs and approaches is same for the two companies and their stakeholders.

The study used a combination of qualitative and quantitative data. Quantitative data usually involve collecting and converting data into numerical form so that statistical calculations can be made and conclusions are drawn. Qualitative data are about recording, analyzing and attempting to uncover the deep meaning and significance of human behavior and experience, including contradictory beliefs, behaviors and emotions nature of data other than numerical expression such as implementation time periods of ERP and the reward on the system relation on operation performance towards on participants perception /stakeholder perception/ to have clear believes on impact of ERP. Whereas, quantitative data based on the operation results recorded by company and data finance recorded through different operation periods, which is describe how much rate is differ when deploying and non-deploying the system on the performance.

Research design are classified as exploratory, descriptive and explanatory (causal) research (Yin, 2003). Moreover, any one or a combination of more than one can be used according to the needs of the researcher, the research questions and objectives, the degree of existing knowledge, the amount of time and other resources available and the philosophical stance of research determined. In this study descriptive and causal research design were used since the nature of this research paper is more describing the benefits of ERP on the organization performance.

### 3.3. Variables, Data Sources and Data Collection Methods

#### 3.3.1 Variables and Data Sources

*Dependent variables* -the researcher use four performance determinants, **Supplier management** is determined by how much processes is controlled and improve any innovation on cost minimization on ERP system applied by the staff, **Customer focus** also determine based on maintain Customer reaction assessment forms, **Management support** how much is the system is applied for changes on strategies by internal and external push factor and **process control and improvement** how much is the system



facilitate the operation on time frame on standard & operational goal attainability also relating with operation performance with organization strategy achievement.

*Independent variables*-ERP implementation on operation performance, to measure ERP implementation, the extent to which a company has implemented its ERP system and redesigned its business processes proportionate with the ERP concept was used (Markus and Robey, 1998).

### **3.3.2 Data collection methods**

The primary source of data used, collected through questioner, for those operators in operation processes how is implantation process and application influence their day to day operation customer satisfaction accordingly, also for those managements affect their decision-making processes by the system about their attitude regarding the system impact. The secondary data for this study conducted is from the company record on Operation performance report in each: Astco food complex and health care food manufacturer companies' management reports for the last 36 months management reports in the period of pre-implementation and 36 post-implementation periods.

### **3.4. Population and Sampling**

As mentioned on literature review: Stakeholder/team/ in business organization have particular responsibility for goal achievements according to their capacity (Cuppen, 2016). In this study the population characteristics is described as those employees having better understanding on their responsibility and work experience and they have stayed more with the company before and after implementation the system and they can describe operation performance more than those join to the company recently Each company's shareholder, managements, staffs are the population type; they better evaluate the achievement of the strategic advantages of the implemented ERP system. The total targeted populations (sample size) is 73 from total population of staff equivalent to 90 staff and Secondary data is used 72 months operations performance reports which is included all operation efficiency and effectiveness.

The population size is described through simplified formula for proportionate analysis by Yamane (1967:886)

$$n = \frac{N}{1+N(e)^2}$$

Where, **n**: is sample size

**N**: number of populations

**e**: level of precision

$$n = \frac{90}{1+90(0.05)^2}$$

$$n = 73$$

Table 3.1 Sample population

Population category		Target population	Selected population
Shareholder		6	3
Management staff	Top level	2	2
	Medium level	5	5
System operator	Supervisor	15	15
	Operator	45	45
<b>Total</b>		<b>73</b>	<b>70</b>

In addition, 36 months performance data before the implementation of ERP and 36 months operational performance data after ERP implementation were collected from the company’s record. The data collection instrument was questionnaire for primary sources data from the company management and system operator. Stratified random sampling techniques from company management and system operator staff, sub-samples are drawn from within different strata that are more or less equal on some characteristics regarding pre-implementation and post-implementation of ERP in each company performance

### 3.5. Reliability of Survey Instruments and Pre-test

Basically, the data survey is consistence of both primary and secondary data: all the data is included in Three sections, the first measuring the assessment of ERP impact on operation performance, the second measuring pre and post implementation of operation performance and the third asking the respondent for some background information to understand the perception regarding ERP. The secondary data consists of in two periods of the company's operation performance in six-year operation performance measurements i.e. the company recourses utilization, cost efficiency operation rewards, quality assurance and goal achievement in ERP application and the primary data respondents were asked to rate whether the operation performance difference is occurred when using ERP implemented (ACPACC). The operational performance determinants are the one adapted from N Hazirha (2011) & Sekaran (2013), and is shown below in figure 3.2 along with the authors reported Cronbach Alphas.

#### 3.5.1. Reliability

In order to measure the internal consistency and reliability of the study hypotheses, Cronbach's alpha ( $\alpha$ ) measure was used. The scales' reliabilities were measured and the Cronbach's alphas of all scales as in Table 3.2 were ranged between (0.77) and (0.84); indicating good reliabilities of the scales. George and Mallery (2003) provide the following rules of thumb: "> 0.9 – Excellent, > 0.8 – Good, > 0.7 – Acceptable, > 0.6 – Questionable, > 0.5 – Poor, and < 0.5 – Unacceptable" (p. 231). The table shows that the reliability of each of the scales is well above the minimum recommended.

Table 3.2: Competing Values measurement instrument with Cronbach alphas

<b>Variables</b>	<b>Cronbach <math>\alpha</math></b>
Customer focus	0.873
Management support	0.880
Process control	0.773
Supplier management	0.858
Operational performance	0.775

Sources:N.Hazirha (2011): Determinants of Operations performance

Coefficient alpha tends to be conservative and can be considered the lower boundary of a test's reliability (Novick and Lewis, 1967). Each operation performance determinants (i.e. Customer focus, Management support, Operation Reward & Supplier management) is obtained by aggregating the value attributes for operation performance. The company operation performance is represented as a combination of the four performance concepts. The data indicate the value placed on each attribute in the company on a monthly report form. The questionnaire also assessed the perception of the stakeholder whether the companies uses an integration methodology or not. It also assessed the amount of effort put into integration for the ERP software. The cover letter and questionnaire used annexed as Appendix-1 and 2. Out of the 70 questionnaires that were distributed to the selected target population 62 were returned being filled by the respondents correctly. The response rate was 88.57% which is very good and acceptable. The status of the questionnaire distributed and their feedback is summarized in Table 3.1

A pilot test was undertaken in some selected 4 respondents before the actual distribution and collection of the questionnaires. There was no that much modifications and improvements to the questionnaires according to the responses of the pilot sample to make it simple and understandable.

### **3.6. Method of Data Analysis**

This section provides details of the data management, data screening earlier to analysis, handling of missing data, outlier examination, normality test and reliability analysis tests and selection of statistical analysis tools for data analysis. Once the data collection (survey) was conducted and the data were collected from different company operation performance monthly reports and the 62 the questioner respondents, the data was captured on to MS Excel (specifically Microsoft Excel 2010). Then it was uploaded into SPSS software to be analyzed. The data set imported to SPSS didn't include any information (e.g., the name or position of respondent).

The data used for this research were both type primary and secondary Monthly operational performance reports (secondary data) is done through MS excel in two period (prep and post Implementation) of ERP and total of in 72 months performance report in order to manage as source of this study it should arrange and scanned as demanded variable nature in MS excel. Primary data type was liker scale questioner which assessed the perception of the company's stakeholder and respondents provided various job titles. In order to manage this, answers were scanned for common themes and the given job titles were categorized into three main categories by the researcher – SH (Shareholder) MNGT (Management staff)

and SO (System Operators). Here they were captured on MS excel and imported on to SPSS as they are and the researcher has categorized on a scale range for analysis.

After importing the data from MS Excel, it was prepared according to the required data formats in SPSS. Using the SPSS data editor, the data file was prepared defining and labeling the variables and assigning numerical format to each of the questionnaire responses, such as assigning short names to variables, assigning descriptive labels to variables, assigning numerical values to categorical variables, and alignment, assigning type of measures to each variable (scale, ordinal, nominal), columns (width). Lastly, cautious verification of the data in the columns and rows for accuracy was made to correct errors during the transfer. As a result, all data was found in the correct positions.

Accuracy of data basic requirement of analyzing the data. Data errors can occur at both respondent and researcher level, as any of these may impact on the analysis and findings.

Missing data is the second critical issue in data analysis. It is a common occurrence in certain areas of research which can affect the results (Tabachnick and Fidell, 2007). Analyzing data were as much as completed from the report of the company operation performance in ERP impact & no missing data observed as much all factor of measurements is consider in 36 pair months reports. So, analysis was done excluding the missing values.

Conceptually the researcher has mainly counted on the Comparison and descriptive analyses to get the means, the standard deviations and the variation T-test for the study development along with their variable items. The items were measured using a liker type scale as well as two period assessment on operation performance reports using paired t-test.

The first assessment is done to assess the relationship of using integrated resources management and the operation performance and to test the study hypotheses, a variation analyses and the paired t-test is used to compare the means of the two samples of related data called T test method of specific measurement tool method needs to be run. A t test used to test whether there is a difference between two independent sample means is not different from a t test used when there is only one sample. The difference between the sample means will not always be zero, even if the samples are extracted from the same population, because the sampling process is randomized, which results in a sample with a variety of combinations of subjects ( Kim, 2015). Now extracted two samples with a size of 72 population in two periods of four operation performance determinates from a population and found the difference in the means illustrated

in table 3.1. The second assessment is describing the perception towards the user to analyses system on descriptive statistics to now the significant and percentage of each level of satisfaction, test was conducted to assure the independency of data. The rule is that each and every construct should independently, the constructs are independent as they correlate with themselves in a way that is stronger in comparison to their correlations with other constructs. Based on the results of the above tests, the researcher can now utilize Significance test and to test the research hypotheses.

Data Analysis tools First part of the analysis consists of evaluating each operation performance determinates in two period of ERP implementation through disparity analysis on the performance effect. Descriptive statistics in The Statistical Package for Social Science (SPSS) software Version 20 was used in analyzing the data for meaningful interpretation of findings. Second part of analysis is measuring relationships between operation performance and ERP implementation. In general, the researcher used different model descriptive statistics, (T Test) to examine the relationship between a dependent variable and one or more independent variables ERP Impact on Operation performance before and after implementation and the variation analyses. To answer research questions, the researcher has also employed means, frequencies, percentage and standard deviations. The Cronbach's Alpha test was also used to test the reliability and consistency of the data collection tool (i.e. questionnaire). To test the research hypotheses, the researcher utilized path analysis and T-values from the Independent T –test method.

### **3.7. Ethical Considerations**

The data collected both primary and secondary were guaranteed that the information they provide is confidential and is used for the purpose of the research and would not be used for any personal demand. This is clearly stated on the cover letter (attached under APPENDIX-1) with the questionnaire. This was basically intended to give security to respondents. The study in the overall was tried to be kept with-in the standard professional ethics.

## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.1. Introduction, and Characteristics of Respondents

##### 4.1.1. Introduction

This chapter contains Results and Discussion of the study and the results and discussion of the research is presented based on the nature of data used as secondary sources and the nature of respondents in accordance with the research questions and also describe the purpose and objective of the study. Those objectives are mainly describing the company's operation performance, and analyzing the relationship implementing ERP have impact on the company operation performance through performance determinates.

##### 4.1.2. Characteristics of Respondents

The data used for the study of the operation performance in relation with ERP implementation is the company's monthly operation performance reports for the last six years as well as the survey data that included personal information, such as job title, current position work experience and total years they have worked for the company. The response rate of the survey is reported below.

**Table 4.1 Response Rate**

<b>Population Category</b>	<b>Distributed</b>	<b>Acquired</b>	<b>Response Rate %</b>
Shareholder	3	1	33.3%
Management Staff	16	12	75%
System Implementers	54	49	90.74%
<b>Total</b>	<b>73</b>	<b>62</b>	<b>84.93%</b>

Table 4.1 shows that the aggregate responses rate from a total population size of 73 is 84.9%. Getting a high response rate (>80%) from a small, random sample is considered preferable to a low response rate from a large sample (Evans, 1991).

#### **4.2. Efficiency: Performance Difference Before and After the Implementation of ERP**

Operation performance difference can occur in a different factor of its processes it may be positively or revers, while in this research study expressed the result occur when applying ERP on efficiency performance. According to (Fraser, 1994) Efficiency is a measure of whether the right amount of resources has been used to deliver a process, service or activity. In this sub section the researcher analyses the result come from both type of date results, showing the operation performance efficiency out comes and answering the research question and tested the hypotheses:

##### **Research Question: What is the relation between ERP application and operational performance?**

Here is below the research result analyses and evaluate on the overall factors through T-Test, mean scores of each operation performance determinants, on Efficiency factors like Sales Volume and production Volume Capacity, Cost of operation, Resources utilization

##### **➤ Result from quantitative data**

In this research conduct using secondary data to measure the efficiency of operation performance difference when using ERP

According to the results analyzed on independent T test for four dimensions/indicators of operational performance presented in table 4.2 a and 4.2b, Efficiency performance described as differently resulted on pre and post implantation periods in all factor like operation processes control of determinates post implementation is greater than pre implementation operation result shown in the mean, (, production volume capacity better performed on post implemented 21,548 and pre implemented 10,226 and have mortmain 110% increment on the mean) and same is true on sales volume operation having better performance on post implemented 21,488 .5 and pre implemented 10,219 .1 and have mortmain 110% increment on the mean).Even their impact on cost of operation has lower cost on post implementation than pre implemented 1,138.7 and 1,177.7 respectively ) In general, the result analyzed from the system on operation efficiency has great difference after implemented ERP in each determinant of operation.



Table 4.2 Results of the t-test analysis for performance difference

Table 4.2a: Descriptive Statistics

Indicators of operational efficiency performance	Period	N	Mean	Std. Deviation	Std. Error Mean
Cost-Efficiency-The total operation Cost /UOM	ERP Pre-Implementation Period	36	1,177.65	208.99	34.83
	ERP Post-Implementation Period	36	1,138.69	66.98	11.16
Operation reward-Efficiency-Monthly capacity of Production volume in UOM	Pre-Implementation Period	36	10,226.07	5,372.96	895.49
	Post-Implementation Period	36	21,548.30	4,720.42	786.73
Operation reward-Efficiency-Monthly capacity of Sales volume in UOM	Pre-Implementation Period	36	10,219.12	5,340.70	890.11
	Post-Implementation Period	36	21,488.47	4,791.52	798.58

According to the research results generated from secondary data, there is big difference on the significance of each operation reward as shown in the table 4.2b the (Sig, 2tailed) of operation reward on sales and production volume. While, insignificant on cost efficiency as shown in table 4.2b therefore, implementing ERP has big difference on Efficiency increment and improvement by 110%

Table 4.2b: T-test Results using Independent Samples Test

Indicators of operation performance		Levine's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Cost-Efficiency-The total operation Cost /UOM	Equal variances assumed	14.664	0.000	1.065	0.290	38.96	36.57
	Equal variances not assumed			1.065	0.293	38.96	36.57
Operation reward-Efficiency-Monthly capacity of Production volume in UOM	Equal variances assumed	1.500	0.225	-9.499	0.000	-11322.23	1192.00
	Equal variances not assumed			-9.499	0.000	-11322.23	1192.0
Operation reward-Efficiency-Monthly	Equal variances assumed	1.057	0.307	-9.424	0.000	-11269.35	1195.84

capacity of Sales volume in UOM	Equal variances not assumed			-9.424	0.000	-11269.35	1195.84
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Source: Analysis result from secondary data (2019)

**Research Question: What difference is occurred when implementation of ERP on operation performance reward?**

➤ **Result from Qualitative data.**

As mention on population sample the data type is mixed and in this sub section the research wants to interpret the survey result which express about the stakeholder perception of ERP impact on operation efficiency performance.

When conducting this research the researcher use questioner survey to analyze the perception of stakeholder operation performance difference when using ERP and from the total respondents of 62 population equivalent to 77% were satisfies (Agreed) that ERP has strong impact on operation performance and for Efficiently control the supplier management of cost minimization and utilizing resources optimal and the frequency for 62 respondents 49 were Agreed (satisfied) on ERP implementation for efficiency of resources utilization and cost.

Table 4.3a Efficiency Measurement (ERP can cut cost and optimize resource utilization)

Level of Satisfaction	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly dis agree	7	11.3	11.3	11.3
Dis Agree	6	9.7	9.7	21.0
Valid Agree	17	27.4	27.4	48.4
Strongly Agree	32	51.6	51.6	100.0
Total	62	100.0	100.0	

Source: Analysis result from survey data (2019)

Table 4.3b shows: from the total respondents of 62 population around 78% were satisfies (Agreed) that ERP has strong impact on operation performance and for Efficiently processes control for producing and sales volume development and the frequency for 62 respondents 48 were Agreed (satisfied) on ERP implementation for efficiency of capacity development and assuring process control.

Table 4.3b Efficiency Measured (ERP can Support in Production and sales capacity development)

Level of Satisfaction	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly dis agree	3	4.8	4.8	4.8
Dis Agree	4	6.5	6.5	11.3
Neutral	7	11.3	11.3	22.6
Agree	20	32.3	32.3	54.8
Strongly Agree	28	45.2	45.2	100.0
Total	62	100.0	100.0	

Source: Analysis result from survey data (2019)

Generally, in both type of data (quantitative and qualitative), the operation performance efficiency is determined in different performance determining factors and show there is high impact on each analyses measurement and in regarding testing the hypotheses sited on chapter one there is positive relationship on ERP implementation and operation efficiency performance difference occurrence.

### 4.3.Effectiveness Performance Difference Before and After the Implementation of ERP

According to (Fraser, 1994) Operation Effectiveness processes can describe in different operation objectives and a non-quantitative concept concerned with achieving strategies. All Operation performance processes has end result and based on the processes management there is a result on achieving the strategies and goals can occur in a different factor of its processes it may be positively or revers, in this sub section expressed the result occur when applying ERP on effectiveness performance and the researcher analyses the result come from both type of date results, showing the operation performance objective outcomes and answering the research question and tested the hypotheses:

#### ➤ Results from quantitative data

Here is below the research result analyses and evaluate on the overall factors through T-Test, mean scores of each operation performance determinates, on effectiveness achievement measurements (profitability, return on investment rate, customer satisfaction and quality assurance and standards meeting)

**Research Question: What impact have ERP in achieving operations strategies during pre and post implementation?**

Operation process is done for the meeting of long-term organization process mechanize in making better efficiency and achievement of better operation strategy in formulating different process management (Marco, 2018). The objective of 54 capital operation performance is for the purpose of developing long term formulated achievement strategies that will bring better rewards, hence in the study shown that the result of each operation performance has better impact after the ERP is implemented.

Operation strategy is coming from on Effectiveness measurements of operation performance (goal achievement, operation reward results , customer focus and resource utilization), in this regard the result assed from the study shows Table 4:4 the mean, standard deviation, for pre and post implementing ERP on effectiveness shows significant difference. The results show that the mean of the profitability range between (111,400) to (724,800) ETB, Recourse Utilization ratio (RUR) range between (2.5%) to (8.06%), Return on investment (ROI) range between (2.5%) to (8.06%) after ERP is implemented. In general, we can say using integrated resource management or ERP has vital impact on keeping the strategies achievement and having define dimension of operation process results.

Table 4.4: Results of Independent sample T Test for effectiveness measurements

Table 4.4a: Descriptive Statistics

<b>Indicators of operation performance</b>	Period	N	Mean	Std. Deviation	Std. Error Mean
Profit-Effectiveness-Monthly profit of the operation (in '000)	ERP Pre-Implementation Period	368,139	111.40	126.848	0.209
	ERP Post-Implementation Period	775,739	724.80	288.420	0.327
Quality-Efficiency-Different resource utilization rate from different aspect	ERP Pre-Implementation Period	368,139	0.0258	0.02958	0.00005
	ERP Post-Implementation Period	775,739	0.0806	0.04064	0.00005
Goal achievement- Effectiveness-Return on Investment	ERP Pre-Implementation Period	368,139	0.0258	0.02958	0.00005
	ERP Post-Implementation Period	775,739	0.0806	0.04064	0.00005

Source: Analysis result from secondary data (2019)

According to the research results generated from secondary data, there is big difference on the significance of each operation results in achieving the strategy as shown in the table 4.4b,

the (Sig, 2tailed) of performance indicators on profit, quality and general goal achievements. Therefore, implementing ERP has big difference on achieving effectively the goal and objectives increment and improvement by 110.7% after ERP implemented.

Table 4.4b: T-test Results using Independent Samples Test

Performance indicators for effectiveness		Levene's Test for Equality of Variances		t-test for Equality of Means			
		F	Sig.	t	Sig. (2-tailed)	Mean Difference	Std. Error Difference
		Profit	Equal variances assumed	57,331.973	0.000	-1,234.950	0.000
	Equal variances not assumed			-1,578.826	0.000	-613.394	0.389
Quality	Equal variances assumed	23,822.088	0.000	-731.398	0.000	-.05480	0.00007
	Equal variances not assumed			-816.430	0.000	-.05480	0.00007
Goal achievement	Equal variances assumed	23,822.088	0.000	-731.398	0.000	-.05480	0.00007
	Equal variances not assumed			-816.430	0.000	-.05480	0.00007

Source: Analysis result from secondary data (2019)

➤ **Result from Qualitative data**

Similarly, like efficiency of operation also effectiveness discussed on bases of the perception of the stakeholder and in this sub section the research wants to interpret the survey result which express about the stakeholder perception of ERP impact on operation effectiveness.

**Research Question: What is the perception of stakeholder on implementation of ERP?**

Table 4.5a shows: the perception of stakeholder in 54 capital companies regarding overall effectiveness of operation performance when ERP is deployed and from the total respondents of 62 population around 78% were satisfies (Agreed) that ERP has strong impact on operation performance and for effectively achieving the companies objectives like profitability, return on investment(ROI) through management support and the frequency for 62 respondents 49 were Agreed (satisfied) on ERP implementation for effectively achieving companies objectives or strategies.

Table 4.5a Effectiveness measurement (ERP support in achieving profitability and ROI)

Level of Satisfaction	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly dis agree	1	1.6	1.6	1.6
Dis Agree	5	8.1	8.1	9.7
Neutral	7	11.3	11.3	21.0
Agree	17	27.4	27.4	48.4
Strongly Agree	32	51.6	51.6	100.0
Total	62	100.0	100.0	

Source: Analysis result from survey data (2019)

Table 4.5b shows: the perception of respondents in overall effectiveness of operation performance of customer focus when ERP is deployed and from the total respondents of 62 population around 67.8% were satisfied (Agreed) that ERP has strong impact on operation performance and for effectively satisfying customer demand and the frequency for 62 respondents 42 were Agreed (satisfied) on ERP implementation for customer focus through meeting standard and assuring quality.

Table 4.5b Effectiveness measured (ERP Have impact customer refocus and meeting quality and standards)

Level of Satisfaction	Frequency	Percent	Valid Percent	Cumulative Percent
Strongly dis agree	3	4.8	4.8	4.8
Dis Agree	5	8.1	8.1	12.9
Neutral	12	19.4	19.4	32.3
Agree	14	22.6	22.6	54.8
Strongly Agree	28	45.2	45.2	100.0
Total	62	100.0	100.0	

Source: Analysis result from survey data (2019)

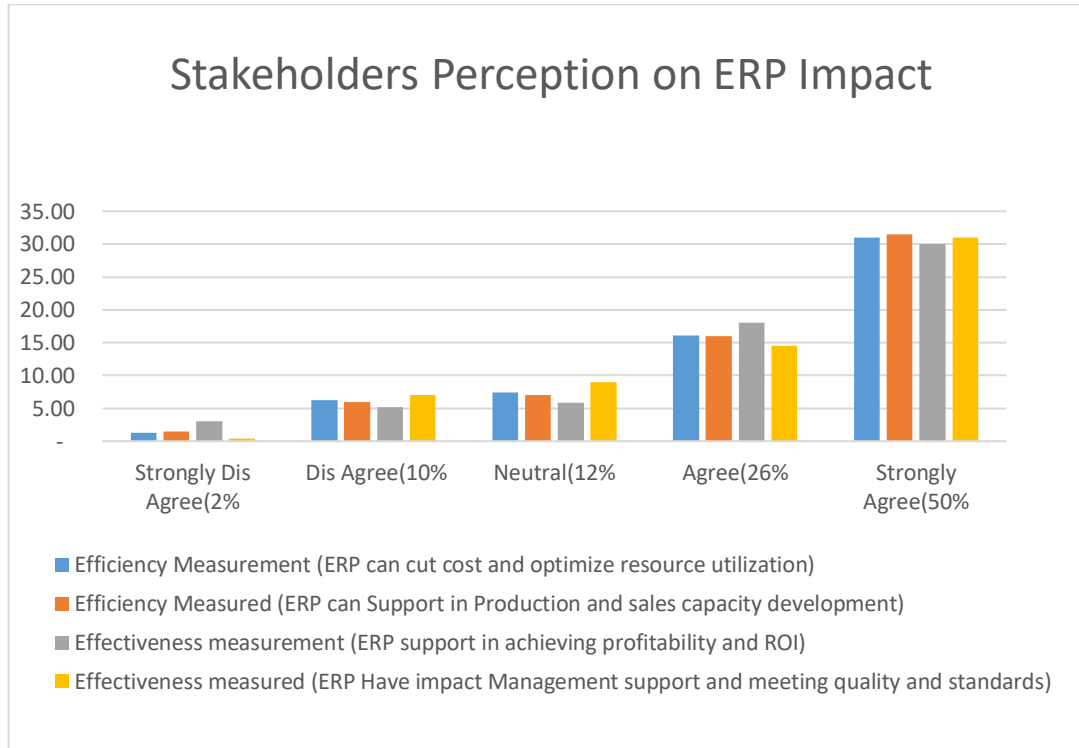
Generally, in effectiveness of objectives both type of data (quantitative and qualitative), show there is high impact on each result and in regarding to testing the hypotheses sited on chapter one there is positive relationship on ERP implementation and operation efficiency performance difference occurrence.

In general description of performance evaluation, the analysis result focuses on the impacts of ERP on operation performance summarized in four indicators of operation performance:

- ✚ Efficiency-Supplier management cut-cost and optimize resource utilization,
- ✚ Efficiency- Process control in Production and sales capacity development,
- ✚ Effectiveness Management support in achieving profitability and ROI),
- ✚ Effectiveness Customer focus Management support and meeting quality and standards.

As described in the literature reviews the aim of operation activity is meeting its long- and short-term objectives specially companies like 54 capital aiming better operation rewards from there operation activates & stated as on their vision and the operation processes result is achieving the operation efficiency and effectiveness. According to Hazirah (2011) & K young (2001) the operation performance determinates: Customer focus, operation reward control, resource supplier management and management support for Goal achievement measurements tells the overall operation activity position. In this regard as per the study is shows on Table: 4.2 the operation rewards having better efficient when ERP is implemented than the period before which shows has big difference each St. deviation 5,372.9 and 5,340.70 mean difference 11,322. And 11,269 for production and sales volume respectively. As presented in the table, increased efficiency, improved effectiveness through optimal using resource, lower operating costs, increased revenue, reduced cycle times, better collaboration and higher profit margins were realized in the post implementation period.

Chart-4.1 Level of agreement with ERP system Implementation on 54 capital operation process



Source: Analysis result from survey conducted (2019)

50% of (62) the respondents were strongly agreed on ERP impact on operation performance 26% of (62) total respondent agreed on the ERP implementation and believed there is impact on operation performance, 12% of (62) total respondent Neutral and. This shows that of the total respondents more than 76% were agreed and almost satisfied by the implemented ERP system and they believed there is impact on operation performance when adapting ERP

The satisfaction level of the respondents, which are the key stakeholders of the company to evaluate the output and implementation success is high.

In general, the perception of stakeholder in the companies were positive attitude deployment of ERP has strong impact on operation.



#### **4.4. Discussion**

This study has examined evidence on the impact of operation performance with the ERP implementation. The main purpose of this study was to identify the relationship between operation performance and ERP impact and to see its impact in overall the company strategic achievement. Operation performance is described in over all the Effectiveness and efficiency of operation process. In this context, the study has first identified the operation performance determinants and measurements in 54 capital companies and secondly identified the major impacts on those determinates' measurements on ERP implementation overall achievement. Moreover, it has also investigated the attitude of the users (shareholder) of ERP implementation on operation performance impact.

Regarding discussions on the findings are presented and reviewed how this research has addressed the research questions formulated in chapter One. First, describing existing operation performance factors in the 54 capital, is there performance deference when using in integrated resource management or ERP implementation. Then, the ERP impact on each operation performance measurement (Efficiency and effectiveness) are examined for the goal achievements. Finally, the impact of ERP implementation on achievement of strategic goal in the operation process discussed through investigative the observed relationships between the two.

##### **4.4.1. Operation performance factors**

According to (Oakland, 2003) Having clear business performance can achieved through improvement strategies capability and doing that through a persistent sited norms and standards as Pillar, such built in norms, standards systems, are referred by many scholars as an organizational stance Therefore, understanding the company objectives and should develop fundamental technologically supported resources management system (ERP).

Achieving the operation performance effectively and efficiently, should assure all performance measurements had efficient with considering Cost of operation, Volume capacity development and Effectiveness with considering the overall Goal attainability through resource utilization and profitability and will rewards better return on investment.

The graphical presented in Table 4.1 of results observed from the respondents in operation performance determinants. The highest score is (Efficiency 4.129 mean), using resources with lower cost support by systemized supplier management is focusing on operation better Economic scales in Production and sales. The second-high determinant (Effectiveness in goal attainability 4.00 mean) is oriented towards

attention on company's long-term objectives are the pillar for all activities and should support modern management system.

#### **4.4.2. ERP Implementation and Performance Difference**

According to Charleston, (2016) Manufacturing companies begin looking at doing an ERP implementation has Process and approach based on their strategy achievement, and also according to According to Hazirah (2011) & K young (2001) the operation process final target is achieving the organization strategies through operation performance indicators , the researcher observed four dimensions/indicators of operational performance those are indicated better performance when using ERP :- performance **Efficiency** utilizing resources and doing operation with lower cost of production has lower and optimal on post implementation than pre implemented, **Effectiveness** , operation reward in goal achievements and profitability of the organization described as better performance on post implantation periods.

In general, as described in the research result : 54 capital companies performed better operation rewards from there operation activates after implemented the system in all performance indicator aspects; Customer focus, operation reward control, resource supplier management and management support for Goal achievement measurements tells the overall operation activity position and the result analyzed from the system on operation efficiency has great difference after implemented ERP in each determinant of operation.

Operation process is done for the meeting of long-term organization process mechanize in making better efficiency and achievement of better operation strategy in formulating different process management (Marco, 2018). The objective of 54 capital operation performance is for the purpose of developing long term formulated achievement strategies that will bring better rewards, hence in the study shown that the result of each operation performance has better impact after the ERP is implemented.

#### **4.4.3. ERP Advantages and its impact**

In different analysis described the impact of ERP, it seems a blessing doing operation via ERP and have different advantages:

According to (Davenport, 1998) centralization of control over information and the standardization of processes, which are attributes more consistent with hierarchical command and control organization with uniform cultures of achieving the purpose of stands

In this research study also addresses the ERP impact has vital for operation management and successfully achieving the strategy achievement of 54 capital companies.

#### **4.4.4. Perception towards ERP impact**

According to (Nagrani. 2017), Stakeholder is the member of the group without whom or who support the organization would cease to exist. They are party with most direct and obvious interest of stake in business decisions and trying to meet the organization goal and strategies, on this research study shows the perception on ERP impacts on Effectiveness of achieving long term and shorter goals (profitability, RIO) are positively perceived Chart 4.1 shows from the total respondents (62) 76% were **Agreed** and almost satisfied by the implemented ERP system and they believed there is impact on operation performance when adapting ERP.

#### **4.4.5. Study Hypotheses Testing**

The results of different analyses described in the previous section shows that we accept Hypothesis (H1): “there is difference in the operational performance of companies when they use ERP system rather than the period none deployed.”

According to N Hazhari (2011) the operation performance has highly affected by the determinant of each operation processes activity and level of processes and highly dependent on each variable,

In summary, Hypothesis (1) tested the relationship between the ERP implementation has impact on operation performance difference, the results found that all determinates on operation performance has positive impact and there is operation performance difference, therefor, in Hypothesis (H1) shows there is positive relationship between Dependent and independent variable.

## CHAPTER FIVE

### 5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1. Introduction

This research is expected at studying the Assessment of Operation performance deference on implementation of ERP the study on 54 capital. It tries to the relationship of ERP impact and operation performances. Definitely, in this new modern and technology world of business, the ERP system is the right solution. This is because in the current business environment ERP can provide companies with various benefits such as, increased efficiency, improved effectiveness on goal, lower operating costs, increased revenue, greater flexibility reduced cycle times, better collaboration and higher profit margins.

To achieve the objectives of this study, the researcher has developed a model to measure the impact of ERP on operation performance on the different literature review done. The model has two main concepts: Effectiveness and efficiency of operation performance from ERP implementation. The Performance effectiveness includes the three determinants: Goal attainability (profitability and Return on Investment), resource utilization (quality assurance) and Efficiency includes three determinants: Volume capacity improvement (sales and Production Capacity) Lower cost of production, while the concept of effectiveness and efficiency from ERP implementation is represented by the four strategic advantages described above that are analyzed as a single variable.

The model data methodology developed was applied and tested in the context of 54 capital company, which has successfully implemented ERP system about more than 3year. The data was taken from monthly reports of the company performance and the survey (questioner) was determined to include management staffs and system implementers of 54 capital staff as they are best suited to impose their perception regarding operation performance pre and post implementation of ERP.

Prior to data collection, it was validated by selected candidates for testing. Validation was in terms of clearance, meaning, format, and its ability to measure the constructs included within the research model. Accordingly, it was updated to include the accepted comments and suggestions received and distributed to the sample of the study. As a result, 62 responses considered valid for data analysis were collected. The analysis was conducted using both Statistical Package for Social Sciences (SPSS 20.0) and independent sample T test (ISTT). Following data analysis, results were obtained and reported in chapter four.

## 5.2. Summary of Findings

The research study observes a number of important results that the researcher hopes would help specifically the 54 capital companies for critical decisions and similarly other business companies associated with ERP implementation and performance factors. It also hoped that such decisions would be reflected positively on their business“ benefits. The research results generated from this piece of work can be summarized as follows.

- All the operation Effectiveness: profitability, return on investment & resource utilizations are considered as high achievement of strategic achievement through the implementation and using the ERP.
- In the company operation performance determinant, Effectiveness, Goal attainability is the highest in terms of mean value in the context of ERP implementation,
- According to the perception of stakeholder: Overall Effectiveness of operation performance comes due to ERP implementation and believe that using through ERP system will facilitate simple, fast and flexible operation processes.
- The ERP implementation advantages: as per the opinion of study sample. For improved efficiency, better resource optimization and increased Efficiency of company operation reward, ERP has vital role.
- There is significant impact operation effectiveness and on the implementation of ERP on perception of user in the 54 Capital company stakeholder
- There is a significant positive impact of efficiency on implementation and using ERP for strategic achievements
- Customers will be satisfied: when the company operation processes are flexible, fast and reliable in all operation processes connected with customer focus activity will be using ERP system

## 5.3. Conclusions

Based on the research study, the researcher fined the following conclusion

The paper examines the relationships among ERP implementation, company’s performance. Model testing indicates that ERP implementation has a significant and positive impact with strong relationship when a company deployed the system, it does provide support for the claim that ERP implementation

encourages efficiently achieving strategy. ERP not only supports management control in achieving operation reward, it also appears to support effectively applying supplier management for better resource utilization and customer focus.

Efficient and effective operations that enhance return on assets, and the ability to invest in working capital, new facilities and equipment, and market exploration as needed.

ERP is more than a tool for cost cutting it provides a rich source of information that allows firms to support a business strategy that pursues growth, innovation, and possibly even entrepreneurship. It provides access to customer and market data that allows a firm to investigate and evaluate external opportunities for growth

In the context of 54 capital companies the overall operation performance achievement is high related with advantage of ERP systems deployment. This is even strengthened by the fact that more than 76% of the respondents have reported on being agreed with ERP system satisfaction on their operation processes value

The researcher wants to restate that the results gained above are only from the performance reports and stockholder perception of 54 capital company perspective.

#### **5.4. Recommendations**

According to the results and the draw conclusions of study, the researcher here offers some recommendations that would enhance the deployment and utilization of ERP systems among other similar organizations nature. The researcher hopes that such recommendations would be taken seriously into consideration so as to enhance the perceived advantages of ERP system.

- ❖ Identifying and understanding the operation processes strategies is necessary before ERP implementation, there is a clear indication of a positive relationship that an appropriate determinants of performance measurements is vital to the successfully using with ERP. Here in this study focusing the operation process starting in the top management support for the achievement of strategic goal, efficiently using resource with lower cost.

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## **APPENDIX**

### **Appendix 1: Research questions cover letter**

April, 2019

Dear Respondent,

I am a student at St. Mary's University and I am an MBA candidate. As a partial fulfillment for my MBA degree I am conducting a study on ERP implementation and its impact on operational performance of 54 Capital companies. The objective of this research paper is to identify the contributions that ERP implementation brought to the operational performance of the companies. Please be confident that the information that you provide will not be used for any other purpose than the study, and it will be kept confidential.

Enclosed with this letter is a brief questionnaire that asks a variety of questions about your understand toward your current job and overall operation. I am asking you to look over the questionnaire and, if you choose to do so, complete the questionnaire and send it back to me.

For the purpose of this research no need to write your name on the questionnaire only your position. I do not need to know who you are and no one will know whether you participated in this study. Your responses will not be identified with you personally,

I hope you will take a few minutes to complete this questionnaire. Without the help of people like you, research could not be conducted.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me at +251-912-096419 or at Sofonyas.alem@gmail.com

Sincerely,

Sofonyas Berhanu

## Appendix 2: Research questions

### Part I: Background Information.

1. What is your title? \_\_\_\_\_.
2. In What department/division you work \_\_\_\_\_
3. Is there ERP system support on your work activity 1=Yes 2= No
4. How long have you worked for the organization? \_\_\_\_\_ *Years*
5. Does 54 capital has some specific plan of action to promote the successful adoption of organizational change the ERP implementation? 1=Yes 2=No

S/n	Questions	Strongly Dis Agree	Dis Agree	Neutral	Agree	Strongly Agree
1	Operation activity highly dependent on ERP resource management system.					
2	Implementing ERP created huge difference in the operational performance of the company					
3	Implementing ERP created huge difference in the quality assurance and in meeting standards					
3	Using ERP is friendly with operator to their day-to-day operation achievement.					
4	Running operation is more prudent when ERP is active.					
5	ERP enables to share data with any department to be immediately synchronized by all departments and sites.					
6	The configuration of data inputs with output sources done correctly					
7	ERP able to integrate the basic processes of all the departments. (i.e., Planning, Manufacturing, Sales, Marketing, Inventory control, Order tracking, Customer service, Finance and Human Resource).					
8	Each operational unit's data can be easily reconciled and understandable by users					

9	Working in integrated system by using ERP system brings confidentiality problem in each business unit					
10	Integration using ERP system leads to the improvement in productivity.					
11	Company uses the integrated data developed through ERP system for its analysis and decision making.					
12	Availability of integrated information from ERP system enables to meet the reporting needs of the departments					
13	ERP integrates both internal and external information flows used by the various Departments of organization with a single, comprehensive solution.					
14	ERP databases and files have been designed to maximize the performance for getting data into applications and therefore fulfill the need of multi-dimensional <b>analysis</b> .					
15	ERP package uses the common database to hold information from the various business functions that are accessible in one form or another by various users.					
16	ERP enables to manage multiple applications on a single database and this creates the operation activity more complex and need as one unit to admin the system					
17	ERP is able to reduce the risk of duplicate / redundant information.					
18	Data model of ERP reflects the entire organization and successfully depict and integrate the data structures of the entire organization.					
19	ERP system enables to maintain consistency in data across the organization's various Departments / geographical locations.					
20	ERP can cut-cost of production in your operation processes relative than non-ERP adaption					
21	ERP system improves efficiency.					
	ERP system meets the need of your daily activities.					

	ERP system is stable, scalable and reliable to increase the growth of company.					
22	The integrated ERP creates positive reward on customer focus					
23	The property management system of ERP eliminates wastages of resources (Inventories)					
24	ERP improves the data accuracy, provides the mechanism to collect, analyze and present high quality information to its employees.					

## DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of my advisor, Maru Shete (PhD), and all sources of the materials used for the thesis have been properly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Sofonyas Berhanu  
Name

\_\_\_\_\_  
Signature & \_\_\_\_\_  
Date

## **ENDORSEMENT**

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

Maru Shete (PhD)

Advisor

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Signature and Date

**St. Mary's University.**

**Addis Ababa May, 2019**