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**College of Natural Science**

**School of Information Science**

**Master Thesis**

**Title: Identifying Critical Success Factors in the implementation of Microsoft Dynamics NAV ERP system: in Case of Selected Ethiopian Companies**

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**Addis Ababa Ethiopia**

**July 2020**

**ADDIS ABABA UNIVERSITY**  
**COLLEGE OF NATURAL SCIENCE**  
**SCHOOL OF INFORMATION SCIENCE**

**IDENTIFYING CRITICAL SUCCESS FACTORS IN THE  
IMPLEMENTATION OF MICROSOFT DYNAMICS NAV ERP SYSTEM:  
IN CASE OF SELECTED ETHIOPIAN COMPANIES**

**A Thesis Submitted to the School of Graduate Studies of Addis Ababa  
University in Partial Fulfillment of the Requirements for the Degree of Master  
of Science in Information System**

**By Derbew Felasman**

**July 2020**

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## DECLARATION

This thesis was not previously approved for any degree and is not being submitted for any degree of candidature at any university at the same time.

I declare that the study is the result of my investigation, except where otherwise specified. I conducted the analysis independently, with the guidance and help of my research advisor. Some sources accept quotes containing clear references. A list of References is attached.

Name: Derbew Felasman

Signature\_\_\_\_\_

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## Abstract

Enterprise resource planning (ERP) systems were highlighted as one of the most common business management systems in the literature, offering the advantages of real-time functionality and greater management power in organizations. With the growth of today's market for information technology, Ethiopian organizations have embarked on ERP implementation systems as a common and necessary platform for leveraging their competitive advantages. Not all ERP implementations were successful though. Since the implementation of ERP brings substantial changes to the business norms, processes, people, and culture of organizations, there are a variety of challenges organizations can face when implementing ERP systems.

Hence, understanding the critical success factors (CSF) when implementing an ERP system is vital as it can provide a successful implementation. Previous research in Ethiopia has mainly focused on the general perspective, whereas only very few researches done in Ethiopia on ERP implementation life cycle, with a limited focus on small sample size and single cases. This thesis complements the research by concentrating on investigating the effect of critical success factors in the chartering phase of Microsoft Dynamics NAV ERP system implementation. This study aims to identify critical success factors in the project chartering phase of Microsoft Dynamics NAV ERP System implementation.

Eight critical success factors are derived from previous research: (1) Project Champion, (2) Project management, (3) Business plan and vision, (4) Top Management support, (5) ERP Team and Composition, (6) Change management, (7) Effective Communication, and (8) Legacy System consideration. Hypotheses are developed from these essential success factors which are evaluated using a survey including 5 rating scale questions in Likert format. The hypothesis is tested using the Pearson correlation coefficient and an application of multiple linear regression.

The results show that two critical success factors are most critical in the project chartering phase of Microsoft Dynamics NAV ERP system implementation. These are ERP team and composition, and change management. The researcher recommended for other organizations to consider the three critical success factors while implementing the Microsoft Dynamics NAV ERP system.

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## List of Acronyms

BPR..... Business Process Re-engineering

CSF..... Critical Success Factor

ERP..... Enterprise Resource Planning

IS..... Information System

IT..... Information Technology

# CHAPTER ONE

## 1. INTRODUCTION

### 1.1. Background

The unparalleled growth of Information systems driven by computer hardware and software systems has influenced all aspects of computing applications across organizations. In a competitive world of business settings, organizations seek to improve or maintain their competitiveness by using information systems to improve customer service and reduce cost. Companies also used to have departmentalized systems, instead of corporate-wide enterprise systems, which cannot share information easily within the organization. This has resulted in data discrepancies which can cause time taking and inaccurate reports for decisions. This affects organization level enterprise performance because of the absence of integrated information systems (Bhagwani, 2009).

To eliminate business problems, Enterprise Resource Planning (ERP) is an enterprise system that addresses such business problems. The ERP system is an enterprise information system designed to integrate and optimize the business processes and transactions in an organization (Carali, 2004). It is also an enterprise-wide information system that integrates and controls all the business processes in the entire organization. ERP is an industry-driven concept and systems and is universally accepted by businesses and organizational industries as a practical solution to achieve an integrated enterprise information system solution (Addo-Tenkorang & Helo, 2011). ERP System kit is an integrated information system with different units such as accounting, finance, supply chain, human resource management, production planning and etc. These modules are incorporated as one information system for enterprises, it organizes and integrates operation processes and information flows to optimum use resources such as human, material, money, and the machine (Carali, 2004).

ERP systems give different strategic and competitive advantages to a company. They provide a single point of data entry facility in such a way that when some data is maintained at a module of one end; it is immediately accessible with the modules at the other ends, thus reducing data entry efforts and redundancy. The ERP system enforces a company to re-engineer its business processes to fit with the ERP solution. To successfully implement an ERP system, there are key areas of

performance vital for the organization to accomplish its mission. Managers grasp and think about these key areas as once they set goals and as they direct operational activities and tasks vital to achieving goals (Elisabeth et al., 2003). These key areas are called Critical success factors.

Critical success factors are of high importance whenever an alternative system is to be adopted and implemented, or a running system needs to be upgraded or replaced. Errors in the choice, implementation, or maintenance of ERP systems, wrong implementation approaches, and ERP systems that do not fit the requirements of the enterprise can all cause financial disadvantages or disasters, perhaps even leading to failures. Several examples of such negative scenarios can be found in the literature (Elisabeth et al., 2003). Critical success factors for ERP implementation as factors needed to ensure a successful ERP project (Carali, 2004).

So, the Implementation of ERP systems is not an undemanding job. While successful ERP systems can boost a company's efficiency, failed systems can be troublesome with the other hand. ERP systems are implemented according to the implementation method by the respective vendor. So, it is important to undergo such research on critical success factors which can lead to successful ERP project implementation concerning the implementation method.

Many organizations in Ethiopia have a goal of being a world-class company & to be a world-class company, it used a more sophisticated information system tool so that its internal work process is shifted from routine tasks to strategic ones (Foziya, 2017). Mainly the benefit which is expected from an ERP system is realized only when it is implemented considering all the pre- and post-implementation activities. Otherwise, the system could be a curse too and drag the entire enterprise into spiraling inefficiency (Tasevska, 2013). Planning and implementation of ERP systems involve an organized approach to meet the needs of several functional areas.

This research implements a survey approach to investigate the effect of critical success factors in the chartering phase of ERP Microsoft Dynamics NAV System implementation focusing mainly on computerizing the major support activities of the company like finance, human resources, and supply chain management and finally develop a research model.

## **1.2. Statement of the problem**

Today Organizations need a system to manage and use information efficiently and integrate their legacy systems like accounting and finance, manufacturing and production, human resources,

procurement, and distribution. Many companies view enterprise resource planning as a future, essential, and critical solution for their businesses to achieve efficiencies and remain successful (Mohamed, Loubna, & Abdelaziz, 2019). Implementing ERP can bring tremendous benefits, or it can devastate businesses unable to manage the implementation process. Adopting a new ERP system is a highly complicated process, and it is not as easy as people expect, it is a difficult job requiring concerted effort, careful thought, and detailed preparation, it also requires a systematic analysis of certain factors important for implementation (Mohamed, Loubna, & Abdelaziz, 2019). According to a survey conducted by Panorama Consulting Group LLC (2014) shows that 54% of ERP projects were reported to be cost overruns, 72% were late and 66% of companies the implementation of ERP software initiatives received less than 50% of the expected measurable benefits.

Critical success factors help organizations develop a concept for identifying the critical problems that give significant effects on the companies during implementation. By determines, critical success factors in ERP implementations phase the corresponding solutions and eliminate or prevent the dominant cause of failure in implementations (Aliyu & Tariro, 2018). Therefore, because critical success factors differ from organization to organization, industry to industry and country to country, it is necessary to carry out research on success critical components that determine the successful implementation of ERP systems (Aliyu & Tariro, 2018). In Ethiopia, the culture and the structure of an organization differ from other countries. Many of the ERP systems are developed based on western countries, organizational context because this organization in Ethiopia adopts those ERP systems from western countries, therefore this shows that there should be more study on ERP in the Ethiopian context.

The estimated implementation cost in 2016 was \$1.3 million, and companies spent on their project an estimated 3.6 percent of their annual revenue (Panorama Consulting Group, 2016). It has several problems facing the implementation of ERP, and companies underestimate the difficulty of implementing an ERP system during their life cycle (Mohamed, Loubna, & Abdelaziz, 2019).

The integrated nature of ERP systems makes them complex and their implementation is not simple. ERPs are not just installed-and-use systems. It takes some time to properly implement them. There are issues and challenges related to ERP projects. These systems are developed based on many industry standard experiences. So, ERPs demand companies to re-engineer their working processes

when there is a misfit between the business processes and the standards in the ERP system. But companies challenge the functionality of these systems by trying to customize to fit business processes instead of re-engineering (Sayegh, 2010).

Now a day there are many ERP vendors all over the world, including the open sources. The most commonly used ERP vendors in Ethiopia are SAP, Oracle, and Microsoft Dynamics NAV. Most organizations in Ethiopia implement SAP and Microsoft Dynamics NAV ERP system while Ethio-telecom and the commercial bank have implemented Oracle ERP system. Several case studies, surveys, and literature reviews have already been conducted by different researchers in Ethiopia for example, (Saron, 2017), (Rahel, 2018) (Foziya, 2017), (Sisay, 2018) and (Sintayehu, 2014). However, the existing ERP system success factor research has focused mostly on single case studies and implementation of ERP systems. Less attention has been given to identifying the critical success factors in implementing ERP systems in each implementation stage, therefore this shows that there should be more study on ERP in the Ethiopian context.

Thus, when implementing such integrated and large ERP packages, it is crucial for developing countries such as Ethiopia to assess the factors that will affect implementation at each phase and to share experiences (Sintayehu, 2014). Sharing lessons is one important tool for the success of projects. Since Ethiopia is a developing country, it is difficult to accept huge budget losses and dissatisfaction of organizations and their customers, delayed or failed ERP systems can cause which.

### **1.3. General objectives**

The general aim of the research is to identify critical success factors in the project chartering phase of Microsoft Dynamics NAV ERP system implementation in the Ethiopian context.

### **1.4. Specific objectives**

The specific objectives of the research are: -

- To review the literature by identifying different papers related to this area of study.
- To determine what Management related factors (Project Management, Business plan and vision, Effective communication, Change Management, Top Management support, and

Project Champion) are critical in the chartering phase of the Microsoft Dynamics ERP system in Ethiopia.

- To determine what people-related factors (ERP team and composition) are critical in the chartering phase of the Microsoft Dynamics ERP system in Ethiopia.
- To determine what technical related factors (Legacy system consideration) are critical in the chartering phase of Microsoft Dynamics ERP system in Ethiopia.
- To suggest a recommendation for future work.

### **1.5. Significance of the Study**

This research aims to identify critical success factors in implementing Microsoft Dynamics ERP systems in Ethiopia organizations, especially focusing on the project chartering phase and proposing a model for implementing the Microsoft Dynamics NAV ERP system in the project chartering phase. The researcher believes that the model fits the organizational characteristics and it can a guideline to help organizations in Ethiopia to have better implemented in ERP systems and improve their success rate. This study is the sharing of information and experience in organizations in Ethiopia regarding the implementation of ERP systems. The research is vital in saving enormous costs and to increase organizations and employee satisfaction which can be incurred and affected by delaying ERP projects or failures at all.

So, the finding of the study can a guide and benchmark for the Ethiopian context and environment in implementing ERP systems. It helps organizations during project preparations, team and employee mobilization, ERP vendor selection, implementation partner identification, change management activities, and other choices that are needed by ERP systems implementations. ERP implementing companies can get ideas in risk identification, mitigation, and setting contingency action plans.

This research could also a reference for further researches in the area and explore major issues related to the system deployment for designing significant milestones as a base and make it available for an academic reference.

### **1.6. Scope of the study**

The study focused only on those companies which implement Microsoft Dynamics NAV ERP System for their activities and the geographical boundary is limited in Addis Ababa city.

In considering the case of the Microsoft Dynamics NAV ERP project, this research is bound to conduct a study on three organizations in Ethiopia to investigate critical success factors of implementation of ERP systems. The research focuses on the eight big ERP modules that are completely implemented and used in case study companies. These modules are Financial Management, Sales and Marketing, Procurement, Warehouse, Manufacturing, Quality Control, Human Resource and payroll, Plant Maintenance.

### **1.7. Organization of the Thesis**

This study is divided into five chapters. Chapter one is about the introduction which comprises problem statements, objectives, scope, and limitations of the study. Chapter two is a comprehensive analysis of ERP literature, critical success factors in the implementation of ERP systems, the process of implementation of ERP, and related works. The third chapter deals in-depth with the analysis methods, data collection, and analytical techniques. Chapter four looks at the data, results, and discussion. Finally, there are findings and suggestions in Chapter five for future research.

# CHAPTER TWO

## 2. LITERATURE REVIEW

### 2.1. Introduction

This section focuses on definitions of Enterprise Resource Planning (ERP) given by various scholars, history, or evolution of an ERP system through different years and the stages of implementation of ERP identified by scholars. This part also includes an implementation phase of ERP systems with its advantage and disadvantage, Microsoft Dynamics ERP system, Critical success factors affecting ERP implementation in the chartering phase, similar studies are performed in the field based on the purpose of the study were also profoundly addressed.

### 2.2. Definition of ERP

An ERP system could be a packaged business software package that enables an organization to automate & integrate most of its business processes and share common knowledge and practices across the entire enterprise (Addo-Tenkorang & Helo, 2011). Esteves & Pastor (1999) further defined the concept of ERP in an easily understood way. It can be viewed from a variety of perspectives. First, and most obviously, ERP is a commodity a product in the form of computer software. Second, ERP can be seen as a development objective of mapping all processes and data of an enterprise into a comprehensive integrative structure. Third, it can be identified as a key element of an infrastructure that delivers a solution to the business. This concept indicates that ERP is not only an information technology solution but also a strategic business solution.

As an information technology solution, an ERP system if implemented fully across an entire enterprise joins various components of the enterprise through a logical spread and sharing of knowledge (Addo-Tenkorang & Helo, 2011). When customers and suppliers request information that has been fully integrated throughout the value chain or when executives require integrated strategies and tactics in areas such as manufacturing, inventory, procurement and accounting, ERP systems collect the data for analysis and transform the data into useful information that companies can use to support business decision-making. They allow companies to focus on core and truly value-added activities (Bhagwani, 2009). These activities cover accounting and financial

management, human resources management, manufacturing and logistics, sales and marketing, and customer relationship management.

### 2.3. History of ERP

ERP is a recent trend in business today. The growth of ERP software starts within the year 1990s. However, it was within the last five years that ERP has really in use and seen record revenues by the software companies. In the past, ERP software was used to figure a critical situation and schedule manufacturing processes (Embong, 2008). The following content summarizes the history of ERP from the 1960s to 1990s:

In the 1960s Inventory Management & Control is that it blends information technology with business processes to maintain an appropriate stock level in a warehouse. Inventory management activities include identification of inventory needs, setting targets, providing replenishment techniques and options, monitoring item usage, reconciliation of inventory balance, and reporting of inventory status (Embong, 2008).

Material Requirement Planning (MRP) technologies used software applications to design development processes in the 1970s. MRP produces operating schedules and stuff transactions that help the assembly needs of a finished product, the manufacturing system structure, existing inventory levels, and the lot-sizing process for each project. (Embong, 2008).

In the 1980s Manufacturing Requirements Planning (MRP II) uses software applications to coordinate manufacturing processes from product preparation, ordering components, inventory management to production of goods (Embong, 2008).

In the 1990s, Enterprise Resource Planning (ERP) uses computer code for multi-module applications to perform internal business processes. Usually, ERP systems integrate business activities across useful departments, from product planning, purchasing parts, inventory control, distribution of products, fulfillment, to order tracking. ERP software systems can include application modules for marketing, finance, accounting, and human resources support (Embong, 2008).

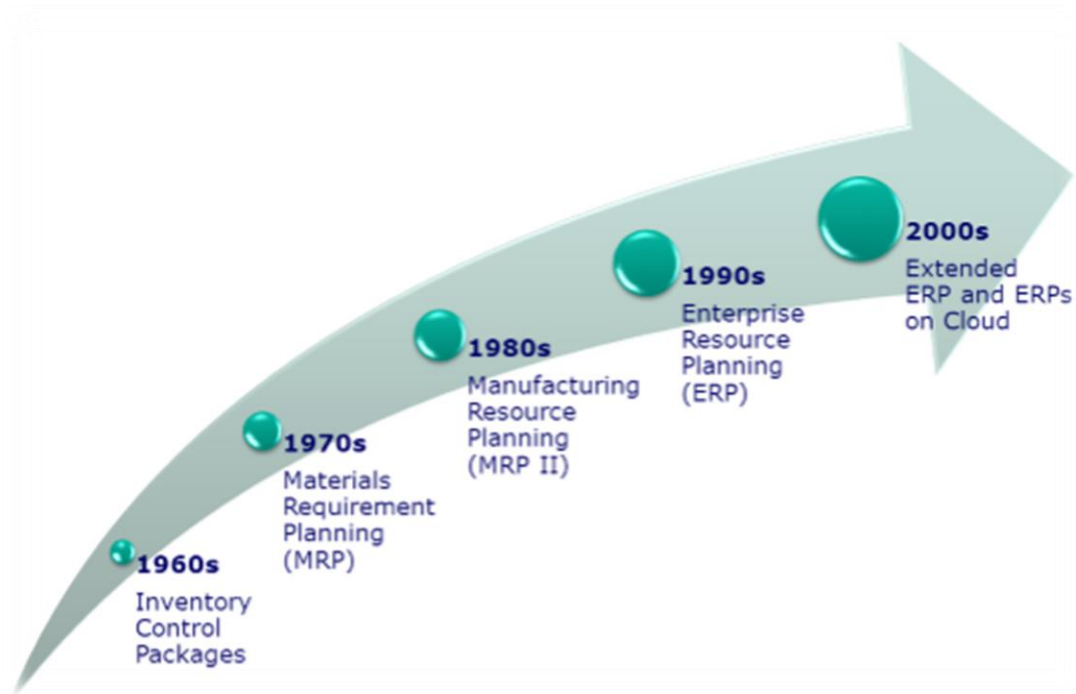


Figure 1: ERP evolution (source (Rashid, 2002))

## 2.4. ERP Advantage and Disadvantage

The principal objective of enterprise resource planning, or ERP, is to mix all departments and functions across an organization into one system by employing a common database, and so to have only one correct set of data (Greengard, 2003).

One challenge that firms face is access to timely data. This is important in creating applicable business choices. Frequently company information is in several databases. For example, records concerning inventory levels could also be found in one database, whereas customer information may be found in its separate database.

ERP systems don't have this limitation because all data is found in one common database. For instance, even though a warehouse supervisor enters data into the system by using the warehousing module, that information is observable across the enterprise (Carali, 2004).

With an ERP system, organizations will process activity on the far side accounting. For example, ERP systems will support distribution, service, and manufacturing. Commonly, an ERP system is organized to match a company's business process. Although firms in a particular industry might

share common business processes, every company might have its specific business processes. An ERP system is improved and organized to meet a company's needs.

Based on the benefits that ERP system brings to the companies, it is easy to conclude that ERP implementation has many advantages (Sayegh, 2010). It promotes business integration by integrating the company's information System, eliminating information asymmetries, and enabling access to real-time information. This is of a significant advantage since it enables companies' users to better plan, analyze and control their activities, and to make a better and more informed decision. ERP systems also promote the organization, standardization across original locations, and facilitate intra-organization collaboration and inter-organization communication by providing database access to partners for an original purpose. Another enormous advantage of an ERP system is that they are very flexible in covering diverse multinational environments such as language, currency, or accounting standards. They also include best practices in business process and follow the latest trends in IT, including open system, client/server technology, internet/intranet, e-commerce, etc. ERP systems also include security features to protect them from outsiders or inside crime, such as misappropriation (Shang & Seddon, 2000).

Dimensions	Sub dimensions
1. Operational	1.1. Cost reduction 1.2. Cycle time reduction 1.3. Productivity improvement 1.4. Quality improvement 1.5. Customer service improvement
2. Managerial	2.1. Better resource management 2.2. Improved decision making and planning 2.3. Performance improvement
3. Strategic	3.1. Support business growth 3.2. Support business alliance 3.3. Build business innovations 3.4. Build cost leadership

	3.5. Generate product differentiation
	3.6. Build external linkages
4. IT infrastructure	4.1. Build business flexibility for current and future changes
	4.2. IT cost reduction
	4.3. Increased IT infrastructure capability
5. Organizational	5.1. Support organizational change
	5.2. Facilitate business learning
	5.3. Empowerment
	5.4. Build a common vision

Table 1: Proposed ERP Benefits Framework (Source: (Shang & Seddon, 2000))

ERP enables role-based access where the level of access is assigned to each user of the system based on his/her needs for information (Tasevska, 2013). For example, certain information is available for the public, customers have access to the information they need through the customers' portal, and managers have access to more detailed information vital for the company's everyday functioning. It also enables the creation of documents for statutory and business activities. It provides them in a user-friendly manner and enables easy modification to users that have authority (Tasevska, 2013).

Ali & Hasan (2010), Greengard (2003), and Sharma (2004) agree that ERP systems have a certain disadvantage associated with them, apart from the many advantages they bring to the companies. Some of them are:

- ☞ The cost associated with implementing the ERP systems can be very high. They include the costs of the hardware and software itself, but also other costs that can be even higher than these direct ones, such as the costs needed to train the employees to use the system and educate partners about its capabilities. The system requires testing, customization, maintenance, upgrade, and consultants since these costs are often overlooked by the companies.
- ☞ The implementation time can take from 12 to 18 months, and the time for real benefits to occur can take a few more years.

- ☞ The need to re-engineer the process to fit the ERP vendors prescribed best practices can cause a loss of competitive advantage.
- ☞ Adopting ERP to a specific company's processes is many times seen as very difficult and comes with additional costs.
- ☞ The switching costs after the implementation are very high for any of the partners involved in the system. These forces companies to stick with these systems for several years make them dependent on the vendors and reduces their flexibility and strategic control at the corporate level.
- ☞ Because ERP systems create a boundaryless organization, this can trigger problems in transparency, duty lines, and morale of employees.
- ☞ Departments can be resistant in sharing internal information and therefore reduce the benefits of the integration.

## 2.5. ERP Architecture

ERP system architecture is organized in layers or tiers to manage system complexity to provide scalability and flexibility.

ERP systems are based on a relational database. Using a relational database and process design allows companies to capture data once and then make that data available for use throughout the firm; by all appropriate users (Daniel, 2006). ERP system mostly runs on a three-tiered client/server system with three layers of logic as diagrammed in the figure.

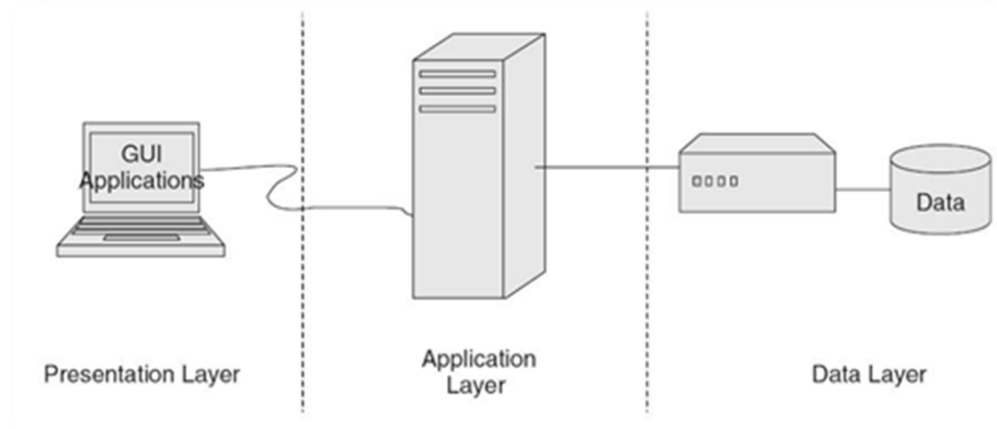


Figure 2: A three-tiered ERP architecture (Source: (Rashid, 2002))

### **The presentation layers**

This is a graphical user interface (GUI) or a web browser that allows users the ability to access and analyze information and system functions.

### **The Application layers**

It comprises business rules, functions, logic, and programs where business processes and end-users interact with the system

### **The Database layers**

This is the management of the organization's operational or transactional data. This is usually built upon industry-standard relational database systems like Oracle or SQL Server. There are three types of data in ERP systems, namely master data, transaction data, and configuration data.

Master data is data in database tables that reference for the day-to-day business transactions. Transaction data is data which contains the day-to-day business activities. Configuration data is data on tables that contain the settings and configurations of the system to suit and fit into the business logic of the organization.

## **2.6. Phases of ERP Implementation**

The experience of an organization with an enterprise resource planning system can be described as moving through several phases, characterized by key players, typical activities, characteristic problems, adequate performance metrics, and a range of potential outcomes (Markus & Tanis, 2000).

The four-phase model builds on the evolving process theory developed by (Markus & Tanis, 2000). Markus & Tanis ( 2000) The model divides and ERP implementation into four stages

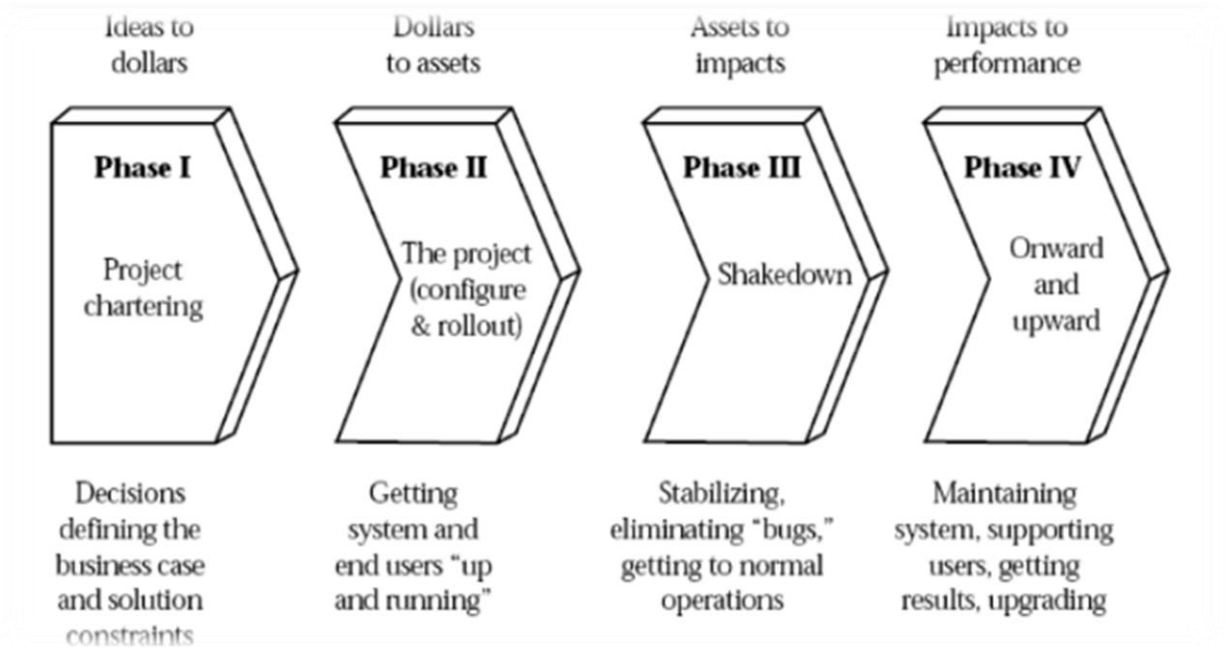


Figure 3: four-phased ERP implementation (Markus & Tanis, 2000).

The chartering phase includes decisions leading to the funding of the ERP system project. The most important activities include building a business case for enterprise systems; selecting a software package; identifying a project manager and approving a budget and schedule and Key Players are Vendors, Consultants, Company Executives, IT specialists (Markus & Tanis, 2000). The outcome is a decision about whether or not to proceed with the project. The chartering phase identified by (Markus & Tanis, 2000) is the focus of this study as this is the phase that case companies are concerned with.

The project section includes the activities carried out to induce the system to be up and running in one or more structural units. Key Players are Internal IT specialists, Project Manager, Vendors, Project team members, and Consultants and Key Activities are system integration, software configuration, data conversion, testing, rollout, and training (Markus & Tanis, 2000).

The shakedown process is the business structure coming to grip the company. The process can be said to end once normal operations are complete, or the organization gives up, disinstalling the system (Markus & Tanis, 2000). The project team may continue to be involved or may pass control to operational managers and end-users and whatever technical support they may get. Activities include fixing and reworking bugs, tuning system performance, retraining and staffing up to

handling temporary inefficiencies. This is to a large extent the phase in which the errors of the previous phases are felt in the form of reduced productivity or disruption of business, but new errors can also occur in this phase (Markus & Tanis, 2000). For example, operational personnel may adopt workarounds to cope with ancient problems and then cannot abandon them when the problems are resolved. Likewise, the company can come to rely excessively on knowledgeable project team leaders instead of building up the knowledge and skills of the enterprise system in all related operational staff. Alternatively, organizations may achieve normal operations. If the latter, the effects because of the organization's use of the system may fit its goals or business needs, or they may not do so (Loh & Koh, 2004).

Then the upward and onward process of regular service continues until the system is replaced with an update or a new system. It is during this phase that the organization can finally find out the advantages of its investment. Key players include (internal or external) operational managers, end-users, and IT support personnel. Vendor, staff, and consultants can be concerned, particularly when it comes to deliberations on upgrades. This phase's characteristic activities include continuous improvement of business, additional user skill-building, and post-implementation benefit assessment; however, these typical activities are often not carried out (Markus & Tanis, 2000). A common issue with the onward and upward step is the lack of experienced workers who understand the reasoning for prior configuration choices and how business processes can be enhanced by system use. Several ultimate outcomes are possible; more improvements or upgrades are also unwilling to be undertaken by the organization. The organization might decide that its investment has been unsuccessful in meeting goals or business desires. Or the organization might decide its experience has been a success. If the latter, the organization's competitive position may or may not have been improved because of its use of enterprise systems (Markus & Tanis, 2000).

## **2.7. Trends in ERP systems**

ERP software is common to most organizations (Aliyu & Tariro, 2018). They rely on ERP systems to help aggregate and organizing data that is distributed through each of their departments. So, these days cloud-based ERP systems are available and the trend is towards the cloud. Cloud ERP refers to ERP applications and services provided and operated in the cloud, as opposed to running the program on-site (Epicor, 2020). Although each company that operates today is different, all of them face a similar challenge to compete successfully in today's business climate, they need access

to technology that allows them to grow, scale and expand rapidly (Aliyu & Tariro, 2018). They need advanced, globally linked, and constantly updated technological tools and systems that allow them to spend more of their time and energy on implementing growth strategies and less on day-to-day IT administration. This is where ERP in the cloud comes in. As technology advances and grows, more businesses of all sizes are considering cloud ERP than ever before. This popularity is largely a function of access, reliability, cost, and speed factors.

The major difference between on-premises ERP and Cloud ERP are:

On-premises ERP is an ERP software and resources program that is locally installed on your hardware and servers and operated by your IT staff. Traditional ERP systems put the maintenance burden on your shoulders squarely. You just buy the core software product once for on-premise ERP systems, so you incur extra expenses for maintaining and upgrading the software and equipment, finding an integration specialist, troubleshooting problems, and keeping the supporting infrastructure up-to-date. Usually, ERP software would restrict the ability to adapt to the program due to increased costs, conflicting goals, and time constraints of updating on-premises. Without frequent upgrades, companies will be left behind with changes to accessibility, security, and usability (Epicor, 2020).

With on-premises ERP, you need to buy or outsource enterprise-wide servers, operating systems, and databases plus antivirus software and backup to help certain servers that other companies consider unworkable. Deployments on-site need continuous support from IT workers who have to ensure that the infrastructure is up-to-date, rather than concentrating on strategic projects of a higher value that can help drive business growth. Offsite access to an ERP on-site network can also differ depending on the technical decisions that were taken during implementation. Deploying an ERP system at the premises can also be a lengthy process that often needs equipment selection approval, buy-in from more stakeholders, and important IT department time allocation (Navaneethakrishnan, 2013).

Cloud-based ERP is a system of enterprise resource planning software and tools which your vendor hosts and manages offsite in the cloud (Navaneethakrishnan, 2013). With cloud deployment, instead of IT administration, you can focus on running your business. As a service system, cloud-based software brings the management and maintenance burden on the provider, rather than the company. Cloud ERP offers constant and streamlined software updates that are already included

in your single annual bill. Deploying cloud ERP also needs little or no intervention in IT, which can allow the team or increase its value to the company by investing more time in projects supporting strategic growth initiatives (Navaneethakrishnan, 2013).

In the cloud, the ERP program will help you turn your attention away from technology to company results. The automated updates help you keep up with the rapid development of changing technology. Often market leaders consider this opportunity to get up-to-date and keep up-to-date as one of the key unforeseen outcomes of transitioning to cloud ERP from an on-site solution. You can create a competitive edge with ready access to more creative business software that expands and develops with the market.

#### Cloud-Based-ERP Benefits

According to Epicor (2020), Here are the benefits of cloud-based-ERP systems: Cloud ERP provides instant and ongoing updates and upgrades to your ERP software and tools, so you'll never have to worry about using the latest technology to fit your business needs.

One of the greatest benefits that cloud ERP provides is that it's much less costly than conventional on-site ERP systems. You can pay for the program once with a license when you install on-premises, but you have other expensive expenses including server purchase and ongoing maintenance, database development and management, initial deployment, energy costs, IT staffing, and protection and backup. With cloud ERP, you pay less in advance and your total ongoing running costs are much lower as the provider cares about you, about updates, maintenance, and security.

Cloud ERP can also be up and running in much less time than ERP systems at the premises. With ERP on-site, you need to think about issues like equipment procurement and purchasing, IT personnel training, potentially recruiting more employees, introducing new data protection policies, and ensuring that everyone on your team has secure access to the resources they need to help you develop your company. Deployment and deployment of cloud ERP are both fast and painless. Deploying the cloud platform is also secure and provides simple real-time data access from anywhere that can help make the entire team more efficient and effective in their roles.

Cloud ERP helps you streamline your company operations. Cloud ERP lets the team and collaborators access knowledge worldwide. You also enjoy world-class security and system

monitoring with cloud ERP, which helps you to develop quickly without having to worry whether or not your information is secure.

Cloud ERP vendors take on much of the responsibility of running a complex ERP program, so you can spend time on what matters most to develop a successful, profitable business. To put it another way, you get to concentrate on what you're best at. When you don't have to think about software updates, downtime, and security problems, you can spend time on areas that will have a direct effect on potential development.

ERP system is managed in the cloud and globally ready, your team can use their mobile phones and an internet connection to access the tools they need from anywhere. Data is available in real-time, so you can make important business decisions without having to wait for others to be in the same room or to access the ERP system from the same location. Or put it another way. It lets you develop a more agile team. This focus on instant accessibility and enhanced collaboration helps boost productivity inside and outside your business.

For any team today that leverages the Internet to run their business, data security is an actual concern. You place the burden on your vendor's shoulders when you invest in cloud ERP, and they ensure that your device is safe from potential attacks or vulnerabilities. Cloud-based ERP providers provide world-class safety support and consumer service.

The cost of deploying cloud ERP systems is predictable and transparent. Either you pay the Software as a service model monthly, or you stick to a pay-per-use plan. There are no unnecessary costs related to software updates and cloud ERP system enhancements because they come under the vendor's liability.

With cloud ERP, your partners, customers, and vendors can easily connect from anywhere in the world to your network. Cloud ERP helps companies to configure applications, reports, and business processes just as much, if not more because the platform is more versatile than conventional ERP solutions. Cloud flexibility ensures competitive advantages for a business. Another advantage is the speedier program deployment. Any changes suggested by the user can be easily enforced. The companies are free to concentrate on their improvements without considering the program implementations.

Disadvantage of Cloud-based-ERP

The traditional approach to ERP needs major investments in money. The cloud-based services are basing on subscriptions. The cloud approach's principal problem is security and confidentiality. Network stability and integration problems are just a few other disadvantages of cloud ERP (Navaneethakrishnan, 2013). The companies are at risk of relying more on cloud services for their ERP-related operations. State and other bodies define requirements and legislation which are not based on cloud type of procedures. This is impossible for organizations to fulfill those criteria. A cloud-based ERP mechanism is not adequately professional to manage an industry's back-office needs (Navaneethakrishnan, 2013).

## **2.8. Microsoft Dynamics NAV ERP System**

Microsoft Dynamics NAV is a fully combined relational database system that enables you to enter and maintain financial and different business activities in one place. Corporations use Microsoft Dynamics NAV 2013 to manage their business operations and processes, like making and posting sales invoices, controlling the inventory, handling purchases, and so on. Microsoft Dynamics NAV 2013 wealthy practicality covers the subsequent business processes (Microsoft, 2012):

- Financial Management
- Sales
- Marketing
- Purchases
- Warehouse
- Manufacturing
- Resource Planning
- Jobs
- Service Management
- Human Resources

However, most companies have very specific needs that are not covered by the Microsoft Dynamics NAV standard application. The gaps between the functionality that Microsoft Dynamics NAV provides and a company's needs can be as small as a simple change to an existing process, or as large as the development of a whole new application area.

Before beginning Microsoft Dynamics NAV ERP systems, you must take special note of the following elements (Microsoft, 2012):

### **Microsoft Windows**

Microsoft Dynamics NAV works within Microsoft Windows or Microsoft SQL Server. All Windows practical and characteristics are present in Microsoft Dynamics NAV.

### **Granules**

Application areas are the submenus found on the navigation pane, like Financial Management or Manufacturing. The individual application areas comprise even smaller units referred to as granules. A granule could be a cluster of options packed along, creating it easier to configure a license.

### **UI Access**

UI objects for showing information are granule-specific and granule-dependent. Therefore, users have different access to the UI, and this defines their interaction with the system when they input and use information.

### **Objects**

The application areas are constructed of small independent units called objects. This structure makes it attainable to alter a selected object without affecting the other objects.

### **Database Behavior**

Because Microsoft Dynamics NAV is a database system, know that entered data is written (committed) directly to the database. Therefore, no safe action is required. Any entered and unposted data can be edited or deleted from the database. Posted data cannot be deleted as they are binding financial transactions.

Microsoft Dynamics NAV works within Microsoft Windows or Microsoft® SQL Server®. All Windows functionality and characteristics are present in Microsoft Dynamics NAV.

### **Architecture**

Microsoft Dynamics NAV 2013 is built on a three-tiered architecture model that improves security, scalability, and flexibility of Microsoft Dynamics NAV. Microsoft Dynamics NAV 2013 supports unique client types and multiple configurations. To install the Microsoft Dynamics NAV 2013, you can choose from several pre-defined setup options.

The Microsoft Dynamics NAV 2013 architecture is a three-tiered architecture that uses three core components:

- ☞ **The client tier:** A client user interface that provides the front end (presentation logic layer).
- ☞ **The middle tier or server tier:** A multithreaded middle-tier server that manages the business logic and all communication.
- ☞ **The data tier:** The SQL Server database server that provides the data layer. It is augmented by Microsoft Dynamics NAV 2013 database components.

For every deployment of Microsoft Dynamics NAV 2013, you must install these three core components. You can have multiple instances of the core components in a production environment. The diagram

The Three Tiers of the Role Tailored Architecture shows a simple installation that has two SQL Server database computers; each associated with a single Microsoft Dynamics NAV Server computer, each of which supports two Microsoft Dynamics NAV roles tailored clients:

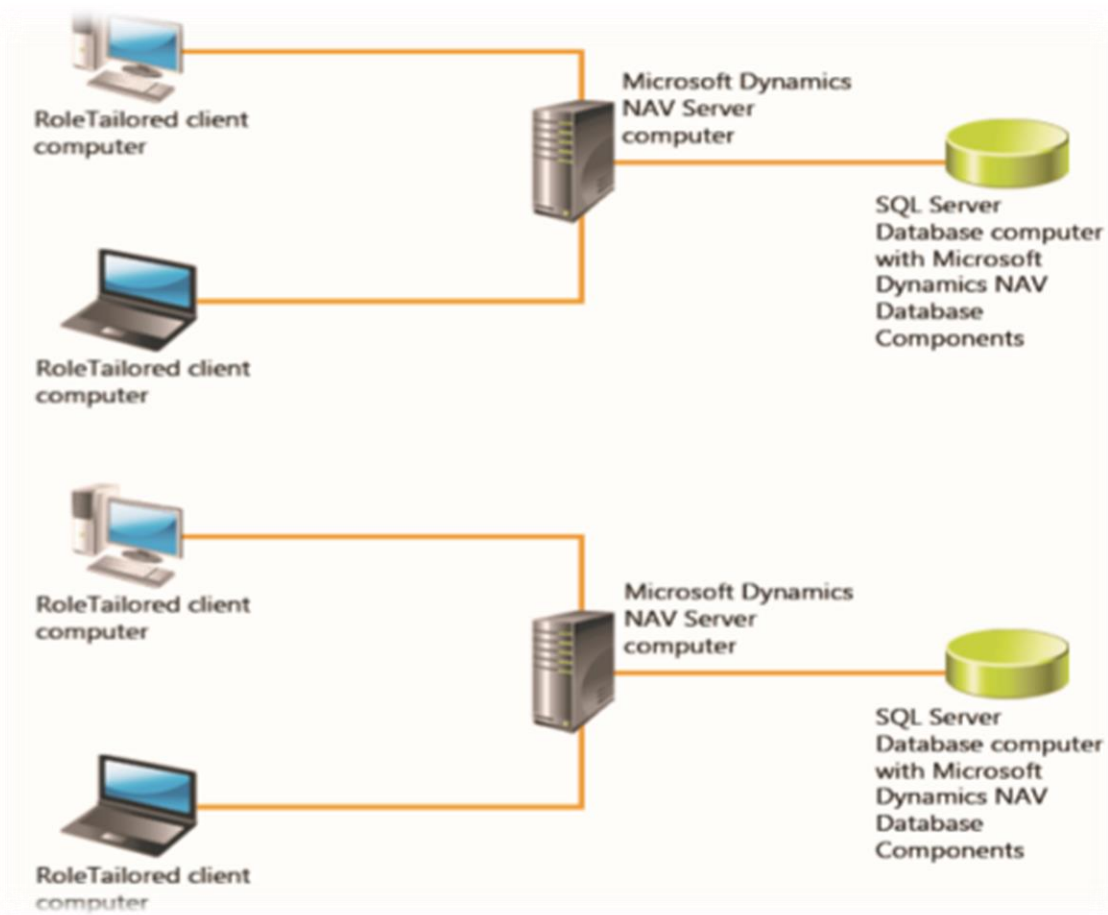


Figure 4: Architecture of Microsoft Dynamics NAV ERP System (Source: Microsoft Official Training Materials for Microsoft Dynamics (Microsoft, 2012)).

## 2.9. Critical Success Factors in ERP Implementation

The implementation of information systems (IS) normally is kind of troublesome. It depends on organization size, scope, and organization process complication. Implementing ERP systems is now a common practice in the world. Although ERP is now a very common phenomenon, the ratio of unsuccessful implementation of ERP is still high. According to an ERP report Of Panorama Consulting Group, LLC (2016) results show that ERP implementation success rate is 57% and only 7% ERP implementation cannot get desired results these results show that ERP success rate is on the higher side.

ERP implementation is very important - a survey in 2013 shows that 54% of ERP projects were reported to be cost overruns, 72% were late and 66% of companies the implementation of ERP software initiatives received less than 50% of the expected measurable benefits Panorama Consulting Group LLC (2014) as shown in Figure.



Figure 5: ERP Implementation Outcome

The execution of an ERP system is a complex and time-consuming project during which companies face splendid opportunities, but also face tremendous dangers (Esteves & Pastor, 1999). To take advantage of the potential opportunities rather than get hitched by the perils of these implementation projects, it is essential to concentrate on those components that underpin the successful execution of an ERP system. Being aware of these factors, a company can positively enhance the success of implementing projects and minimize the ERP project's risks (Ahmed,

2003). These keys are called critical success factors that are of high importance whenever an alternative system is to be swept up and carried out, or a running system needs to be promoted or replaced. Errors throughout the choice, implementation, or maintenance of ERP systems, wrong implementation approaches, and ERP systems that do not fit the enterprise can all cause financial disadvantages or disasters, perhaps even leading to insolvencies (Christian, 2016).

Critical success factors define key areas of performance essential for the organization to accomplish its mission. Managers implicitly recognize and think about these key areas after they set goals and as they direct operational activities and tasks necessary to achieve goals. However, when these key areas of performance are made explicit, they provide a common point of reference for the entire organization (Christian, 2016). Thus, any activity or initiative that the organization undertakes should guarantee systematically high performance in these key areas; otherwise, the organization may not achieve its goals and consequently may not accomplish its mission (Carali et al., 2004).

Critical success factors are those factors essential to achieve organizational desired goals from ERP. The success of all ERP projects depends directly on the success of the critical success factors (Christian, 2016). Critical success factors are of high importance whenever an alternative system is to be adopted and implemented, or a running system needs to be upgraded or replaced (Embong, 2008). Errors during the selection, implementation, or maintenance of ERP systems, wrong implementation approaches, and ERP systems that do not fit the enterprise can all cause financial disadvantages or disasters, perhaps even leading to failures. Several examples of such negative scenarios can be found in the literature (Elisabeth et al., 2003).

Several empirical and non-empirical types of research have discussed various critical success factors for the implementation of the ERP systems. The results of some major research on success factors for implementing ERP were described below. Ozorhon and Cinar, (2015) presented the critical success factors of ERP system implementation in the construction industry focusing on developing countries. Fourteen critical success factors were identified from a comprehensive literature review. A survey study was conducted to analyze the impact of these factors on ERP systems implementation. The results from the statistical analysis showed that the most significant factors for successful implementation were: effectiveness of the project leader, clear goals and objectives, top management support, cooperation between team members, and project team

competence. While the results from factor analysis showed that factors were grouped in three dimensions technology, human, and organization factors.

Aliyu and Tariro, (2018) investigated the review of critical success factors of ERP implementation from 2002 to 2016 including implementation benefit success, factors affecting implementation, and implementation successes of ERP. The study used a Systematic Literature Review. 45 critical success factors were identified from a comprehensive literature review. Finally, the researcher analyzed critical success factors by grouped them into four categories which are project-related factors, organization-related factors, individual-related factors, and customization of ERP factors. Though many factors were identified in their study, the researcher was discovered that some ranked higher than others in terms of importance. For instance, the most prominent factors across articles included project management, top management support, user involvement, project management, Change management.

Talluri & Vasu, (2019), presented the impact of critical success factors in ERP implementation in small and medium. This paper is aimed at reviewing present state-of-the-art (1998-March 2019) on the impact of ERP implementation in Small and Medium Enterprises. Thirteen critical success factors were identified and finally, the researcher grouped them as success and failure factors. ERP failure factors include unrealistic expectations on ROI, inadequate training and education, lack of inadequate commitment from top-level management, incompatibility between organization business processes and ERP software, inadequate resources, inadequate requirements for definition, and employee resistance. Success factors of ERP implementations include change effective management, BPR with minimum customization, full support from top-level management, ERP package selection, and adequate training, communication procedures, and organizational commitment.

Mohamed, Loubna, & Abdelaziz, (2019) implemented a systematic literature review on the success factor for ERP implementation. The researchers identified over 40 CSFs, among these 12 were selected according to their importance for a successful implementation. Then the researcher divided those factors into their categories. ERP organization factors include Effective communication, top management support, business plan, and vision and training, and education. ERP project factors include BPR management, project management, project team

composition/teamwork, project teamwork, and change management. ERP technologies factors include legacy systems considerations, technical implementations, ERP choice.

### **2.9.1. Critical Success Factor in the Chartering Phase**

An organization's experience with an ERP System can be described as moves through several phases, with key players, appropriate performance metrics, characteristic problems, typical activities, and a range of consequences (Markus & Tanis, 2000).

As mentioned previously, this research concentrates on what Markus and Tanis (2000) define to be the chartering phase of the ERP implementation life cycle. According to Markus and Tanis (2000), the chartering phase is: building a business case, selecting a software package, identifying a project manager, and approving a budget and a schedule. Many errors or problems can arise during this phase (Julie & Jonathan, 2008). The business case for investing in an enterprise system can be incomplete or faulty; the organization may seriously underestimate the need for business and organizational change with the software implementation. The outcome of this phase may be a decision not to proceed with the enterprise system or a decision to proceed (Julie & Jonathan, 2008). If the latter, the chartering decisions passed on to the next phase may be sound or unsound (Esteves & Pastor, 1999). An example of an unsound charter is a build-to-order company purchasing an ERP package designed for a make-to-stock business. Another example is the decision not to assign enough resources for change management and training. A third is a decentralized firm's decision to require more standardization of business processes needed to achieve business benefits. Still, the choice of a highly inexperienced project manager is another. Still, another is the choice of a highly inexperienced project manager.

Only a few authors have done research that presents critical success factors in their importance in the chartering phase of the implementation process. Because of their research, Parr & Shanks (2000) state that there are four critical success factors; these are Project Champion, Top Management Support, Commitment to the change, and A Vanilla ERP Approach, important in the chartering phase. Nah et al. (2001) believe that there are seven factors are Project Champion, Project Management, business plan and vision, Top Management support, ERP team and composition, effective communication, and Legacy systems consideration. Loh & Koh (2004) conclude that there are six critical success factors in the chartering phase; the project champion,

project management, Business Plan and Vision, Top Management support, ERP team and composition, and effective communication.

The researcher selected these variables because previous researchers which are discussed in the literature review section identified that these variables are the critical success factors that affect the chartering phase of Microsoft Dynamics NAV ERP system implementation moreover these variables are the ones that capture the essence of the study.

## **2.10. Related Work**

A detailed and focused literature review is done to understand more about Enterprise Resource Planning concepts and ERP systems. Only a few authors have done research that presents critical success factors in each phase of the ERP implementation systems.

As a result of their research, Parr & Shanks (2000) had researched a model of ERP system implementation. The purpose of the research was to present a project phase model of ERP implementation systems that is a synthesis of existing ERP implementation process models and focuses on the implementation project. The researchers researched two case studies of ERP implementation within the same organization, one unsuccessful and a later successful one, are reported and analyzed to determine which critical success factors are necessary within each phase of the project phase model. The researchers have drawn critical success from an earlier stage of this research and recent literature. The researchers conclude that there are four critical success factors important in the chartering phase. These are Project Champion, Top Management Support, Commitment to the change, and A Vanilla ERP Approach. Finally, the authors recommend that the project phase model together with associated critical success factors provides direction for practitioners when planning ERP implementation systems and also provides researchers with a foundation for further empirical research.

Nah et al. (2001) had conducted research on critical factors for the successful implementation of enterprise systems. This study investigates the critical success factors in the ERP system implementation phase. After a comprehensive review of the previous literature, the researchers found eleven factors to be critical to ERP systems implementation success. These are top management support, ERP teamwork, and composition, business process re-engineering with minimum customization, change management program and culture, business plan and vision,

project management, effective communication, monitoring and evaluation of performance, software development, testing and troubleshooting, project champion, appropriate business and IT legacy systems. Finally, the researchers made the classification of those factors into the respective phases (chartering, project, shakedown, onward and upward) ERP implementation in Markus and Tanis' ERP life cycle model is presented and the importance of each factor.

In the Ethiopian context, Foziya (2017) conducted research at the Commercial Bank of Ethiopia on Factors affecting the implementation of Enterprise Resource Planning. The analysis aimed to analyze organizational, technical, and individual factors influencing the implementation of ERP at each point of ERP implementation in the Commercial Bank of Ethiopia. In her research method section, the researcher used a case study in which data were collected and analyzed using a qualitative research method. Pattern matching technique has been used to test the data gathered through interviews, direct observation, and participation. The research revealed the factors affecting the implementation of ERP as technical, organizational and human, the stages of implementation of CBE ERP (requirement study, solution design, designed and test solution, and development transfer and support), the effects of these factors in their associated stage and the current status of implementation of ERP in Ethiopia's commercial bank. Last, the researcher suggests an excellent management strategy and clear communication during system implementation is a crucial problem for the ERP's performance.

Rahel (2019) had conducted research developing ERP pre-implementation readiness assessment framework for the Ethiopian context: a multi-stakeholders' perspective. This study aims to investigate ERP Pre-implementation readiness from multi-stakeholder holders' perspectives such as technical, organizational, consultant, user, and vendors perspective in Ethiopian Electric Utility organizations with the view to developing a framework for evaluating of ERP Pre-Implementation readiness and design a solution framework to address those issues. In her research method section, the researcher has used interviews, documents, and survey questionnaires' to collect data. Finally, the researcher proposed an ERP pre-implementation readiness assessment framework. The researcher recommended that any organization involved in implementing ERP should be able to use the suggested pre-implementation process to discuss all facets of an organization to achieve effective implementation. The feasibility assessment of the proposed structure result showed that

the case firm had limitations on the number of dimensions and also showed areas where the client needed to pay attention to filling the void.

Derese (2013) had conducted research at EthioTelecom, a government firm, to ensure the effective implementation of ERP. The main objective of the research was to present insights gained from a successful ERP implementation project when the Oracle ERP framework was introduced by the case study organization. The researcher used a case study approach as a research technique, using qualitative and quantitative approaches. The researcher developed a framework that defined critical success factors to tackle during the phases of pre-implementation, implementation, and post-implementation. Besides, the researcher also recommended conducting a comprehensive empirical study to further understand the direct and indirect relationships among the critical success factors and the actual benefits of ERP adoption.

Zewdu (2016) had conducted research on Developing, a framework for Evaluation of ERP Pre Implementation Readiness: The Case of Dashen Bank Share Company. The purpose of this study was to investigate ERP Pre-implementation readiness using parameters (constructs) such as organizational, technical, and cultural in Dashen Bank Share Company with the view to develop a framework for evaluation of ERP Pre-Implementation readiness and design a solution framework to address those issues. In his research methodology section, the researcher mentioned conducting a survey method. Questionnaires were prepared based on the stated research model and as a sampling method, Purposive sampling was used for the research. The survey shows that the case company has limitations on the number of dimensions and has also shown areas the company must pay a visit to fill the gap. Based on the findings, the researcher proposed a framework for the evaluation of ERP Pre-Implementation. Finally, the researcher recommends that any organization interested in implementing ERP can use the proposed pre-implementation framework to addresses all aspects of an organization to attain implementation success.

Sintayehu (2014) used a case-study at Ethiopian Airlines to conduct research on crucial success factors for ERP implementation. The study aimed to examine key success factors and share experiences with other Ethiopian organizations with similar history and climate. In its section on research methods, the researcher listed conducting a qualitative case study using interviews, observations, and an online survey questionnaire as the key techniques of data collection. In Ethiopia, the study identified twenty factors crucial for the success of the implementation of ERP

systems. These factors are top management support and communication, project planning, project management, and leadership, change management, the capability of consultants, organizational readiness, and overall knowledge transfer.

Sisay (2018) had conducted research on comparative analysis of critical factors affecting ERP implementation in private and public organizations in Ethiopia: a Pareto approach. The key objective of the study was to identify the top critical factors affecting ERP implementation in private and public organizations in context to Ethiopia. As a research method, the researcher used interviews, documents, and survey questionnaires' to collect data. As a sampling method, the researcher applied purposive sampling. Quantitative data were used to explain the data using descriptive statistics such as frequencies and percentages. Pareto's approach was implemented to define the more important factors that influence ERP implementation. The study established top management support and commitment, the composition of teamwork, the availability, and facilitation of IT infrastructure as critical issues in both cases. However, training and support for users, business process re-engineering and software configuration, consultant selection, and relationship end-user involvement, the existence of a communication plan, are identified as the crucial factors that were found in a private organization than public organizations. On the other hand, implementation strategy and time frame, financial plan, customization/localization of software according to the environment, budgetary constraints are identified as the vital factors found in a public organization than private organizations. and finally, the researcher, recommends managers, users, implementers, and any other stakeholders should be focused on these key factors in implementing an ERP system in any organization.

The study has reviewed the previous literature with a focus on critical success factors for ERP system implementation in the worldwide and in developing country in particular to identify a gap on the literatures used and referred on this study. The researcher has analyzed the literature gap to the subject matter of the study in to two parts that are to be the concept gap and the amount of previous study availability gap regarding the critical success factors of ERP system implementation from ERP life cycle perspective. There is a shortage in the availability of the research made on critical success factors of implementing ERP system in the developing countries in general and Ethiopia in particular.

However, only very few studies have been conducted in the area that directly related to critical success factors of implementing ERP system in the ERP life cycle perspective in Ethiopian context. To bridge this gap, this research was aimed to identify the critical success factors which adversely affect the success of ERP system implementation in project chartering phase by considering the case companies.

### **2.11. Chapter summary**

The literature review focused on the Enterprise Resource Planning that provides a valuable role in the organization, it is one of information and communication technology that has been developed for integrating various activities of the firm, to improve information flow, reduce cost, streamline business processes, better resource management, improve productivity offer product Variety, establish linkage with business partners, Support organization structure change, reduce cycle time, building common visions and to reduce response time to customer needs. All these benefits cannot realize without the successful implementation of the ERP system. In this chapter, original issues were reviewed which are factors and challenges regarding ERP implementation in the chartering phase. It resulted in around eight factors to be critical factors in the ERP implementation in the chartering phase. Also, the researcher presents different related works to get the findings and methodology of other researchers in that the way how to conduct and identified the factors of ERP implementation. Furthermore, it covers different relevant literature that is related to this study.

# CHAPTER THREE

## 3. RESEARCH METHODOLOGY

A research methodology is a way of systematically addressing the question of the study. It may be understood as a science of studying how scientific research is carried out (Coldwell & Herbst, 2004). The research model and hypothesis, research design, research strategy, sampling design, data collection methods, and data analysis are discussed in more detail in this section. All the elements in this chapter are constructed based on the research intent which identifies the ERP implementation critical success factors during the chartering process.

### 3.1. Research model and Hypothesis

Here are the critical success factors in the chartering phase of the research (Julie & Jonathan, 2008).

- ☞ Project Champion
- ☞ Project Management
- ☞ Business plan and vision
- ☞ Top Management support
- ☞ ERP team and composition,
- ☞ Effective communication
- ☞ Legacy systems consideration
- ☞ Change Management

**Project management:** refers to the continuous administration of the implementation program (Finney & Corbett, 2007). Good project management plays a vital role in the successful implementation of ERP. Individuals and groups of experts' expertise in ERP are given the responsibility to take the implementation project to success (Parr & Shanks, 2000). The implementation of an associate degree ERP system could be a distinctive procedure that needs enterprise-wide project management. The planning phase, therefore, involves the allocation of responsibilities, the definition of milestones and critical paths, training and human resources planning and the determination of success measures (Nah et al., 2001). This creates a more organized approach to decision making and guarantees that decisions are made by the most suitable company members. Thus, I hypothesize that:

H1: Project Management is a critical success factor in the Project Chartering Phase of Microsoft Dynamics NAV ERP system

**A project champion:** is a staunch advocate of the ERP implementation project and is necessary for better and faster agreement within the project team, and for overseeing the entire project life cycle and all processes (Julie & Jonathan, 2008). The project champion's key tasks are to be the first contact person for any issues concerning the ERP project and to ensure project progress within the enterprise. The project champion ensures the prompt resolution of conflicts and resistance, serving as a mediator to a certain degree (Loh & Koh, 2004). In many ERP implementations, the leader of the ERP project takes the position of a project champion, but this is not the only solution. A member of senior management that is not a direct project team member can also act as project champion (Julie & Jonathan, 2008). Thus, I hypothesize that:

H2: Project Champion is a critical success factor in the Project Chartering Phase of Microsoft Dynamics NAV ERP system

**Top Management Support and Involvement:** is top management advocacy, provision of adequate resources, and commitment to the project. Top management must define the project as a top priority and specifically (Nah et al., 2001). Committed leadership from top management is the basis for the continuous accomplishment of every project (Finney & Corbett, 2007). Thus, I hypothesize that:

H3: Top Management support is a critical success factor in the Project Chartering Phase of Microsoft Dynamics NAV ERP system

**ERP team and Composition:** The ERP team will be made up of the organization's best employees. It is also important to shape a cross-functional team (Nah et al., 2001). The team will have a combination of contractors and internal staff so that the internal staff can build the technical expertise needed to design and execute. For success, both business and technical knowledge are necessary (Nah et al., 2001). Managers should be assigned full time to the implementation and partnerships should be managed with meetings scheduled regularly (Loh & Koh, 2004). Thus, I hypothesize that:

H4: ERP team and composition are critical success factors in the Project Chartering Phase of Microsoft Dynamics NAV ERP system

**Business plan and vision:** A clear business plan and vision are required during the entire ERP life cycle to guide the course of the project. There should be a simple business model, a justification of investment, a project mission, and identified goals and benefits (Nah et al., 2001). Thus, I hypothesize that:

H5: Business plan and vision are a critical success factor in the Project Chartering Phase of Microsoft Dynamics NAV ERP system

**Effective communication:** is critical to the success of ERP implementations (Loh & Koh, 2004). Communication includes the formal promotion of project groups and therefore the aid of the project to attain the rest of the organization. Expectations at each level need to be communicated (Nah et al., 2001). Nah et al. (2001) State that communication should penetrate all levels in the company; from upper managers to bottom operators, everyone should know what to expect in the business process change. They continue to explain that communication increases the willingness of people to change and take part. Thus, I hypothesize that:

H6: Effective communication is a critical success factor in the Project Chartering Phase of Microsoft Dynamics NAV ERP system

**Legacy Systems Consideration:** Legacy systems are the existing system used until the current system was introduced. These are the key sources used to provide feedback for the new business method and system (Christian, 2016). Therefore, the company will take care to preserve the files intact when moving the data from the legacy system to the new system. The data can be stored as tables, or they are historical data, and also manually stored. Such kinds of activities are the basic reasons for migrating from the old system into the new system. This suggests that every organization, before moving the data to the new system, will accept the legacy system (Christian, 2016).

Thus, I hypothesize that:

H7: Legacy systems consideration are a critical success factor in the Project Chartering Phase of Microsoft Dynamics NAV ERP system

**Change Management:** Parr & Shanks (2000) define the commitment to the change as determination. They state that a company should have persevered in the face of expected problems with implementation. Thus, I hypothesize that:

H8: Change management is a critical success factor in the Project Chartering Phase of Microsoft Dynamics NAV ERP system

Based on the above critical success factors, this study aims to develop a research model that incorporates the principal factors leading to the successful implementation of an ERP system in the project chartering phase.

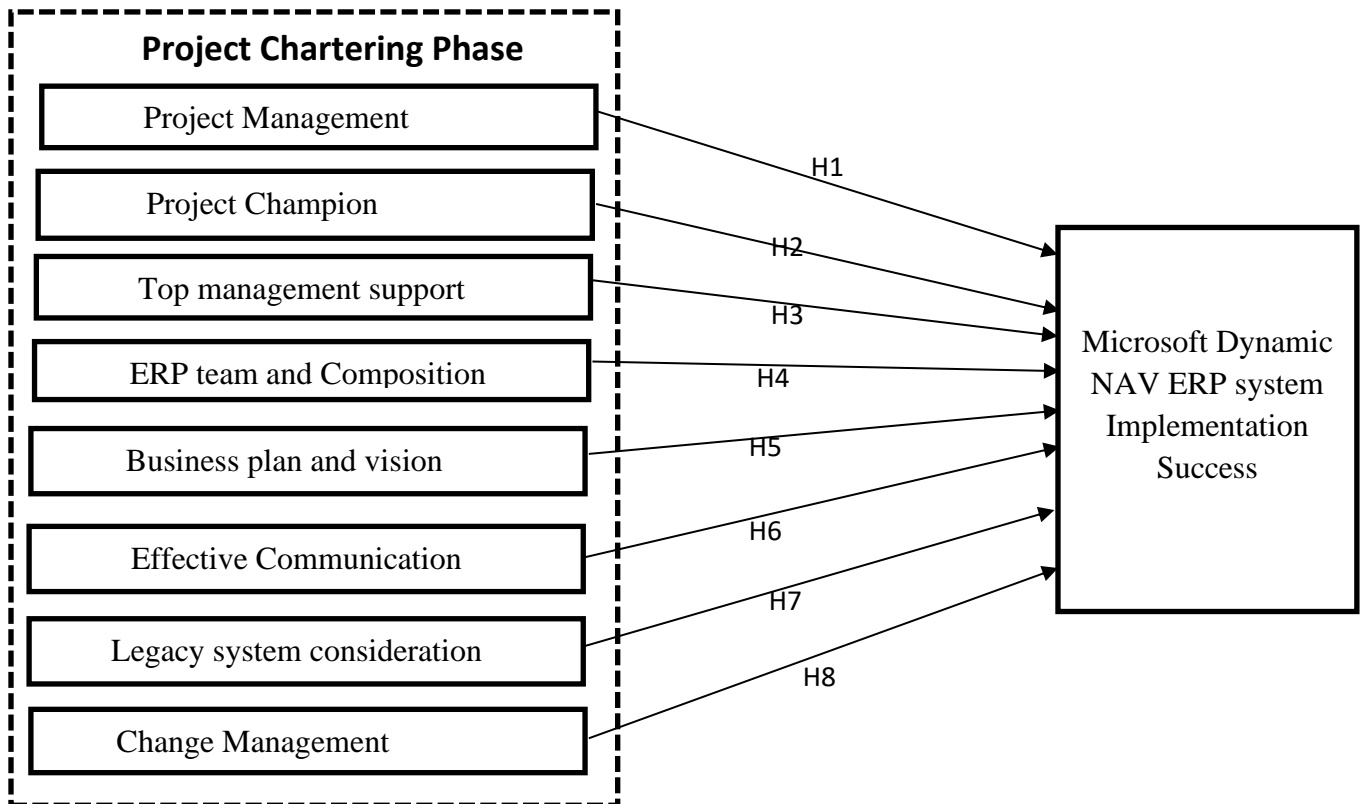


Figure 6: Research Model

### 3.2. Research Design

The research design is the overall plan of how the researcher intends to implement the project in practice. Coldwell & Herbst (2004) asserted that research design is a time-based plan of activity focused on research questions. There are various types of research designs such as descriptive, explanatory, correlational, and exploratory. In this research, the correlational research design is used. This research method is considered for this study by the following reasons and justifications.

First, this research aims to identify key issues and variables, and it is suited to test the research hypothesis. Correlational research design is the measurement of two or more factors to determine or estimate the extent to which the values of the factors are related or change in an identifiable pattern (Saunders et al., 2009).

### **3.3. Research Strategy**

The research strategy is a general orientation to conduct business research (Benbasat, 1987). There are two distinct research strategies, i.e. Quantitative and qualitative. Thus, quantitative research can be taken as a research strategy that emphasizes quantification in the collection and analysis of data. The quantitative approach emphasized the collection of numerical data; it drew influences from those data and resolve problems using numbers. Quantitative research can be taken as a collection of numerical data and exhibiting a view of the relationship of the theory-empirical findings. Qualitative research can be taken as a research strategy that usually emphasizes words rather than quantification in the collection and analysis of data (Saunders et al., 2009).

The foregoing two-research technique concepts illustrate the rationale behind this study's decision to follow the quantitative method. The study draws hypotheses from a comprehensive literature review to check the relationship between variables. The researcher used a survey, in which users of the Microsoft Dynamics NAV ERP system were asked to rate the variables on a Likert scale. The supplied data was then converted into a numerical value and statistically tested via statistical software. Also, the aim and approach of this study are to implement a quantitative research strategy to allow the hypotheses to be accepted or rejected.

### **3.4. Sample and Sampling Techniques**

The sample size and how it is chosen can be used in quantitative analysis to determine the reliability of the survey results (Benbasat, 1987). A sample is a segment of the population selected for investigation, hence a population sub-set (Benbasat, 1987). Saunders et al. (2009) outline the reasons for using the samples in the study. Because of budget limitations, it would be unviable to survey the entire population, and time restrictions prevent the survey of the entire population. For this study, probability sampling was selected as this is most widely used in survey techniques where one needs to draw inferences from a population sample to fulfill the aim of the research. Testing all system users within the chosen organizations using nonprobability samples would have been impractical. Where one tries to make the overall target population generalizations. To call a

study representative and be able to statistically generalize the results, appropriate sample size is needed for the data collection process Saunders et al. (2009).

For this research, companies were selected based on two reasons. The first reason is the selected companies must implement the Microsoft Dynamics NAV ERP system recently. The second reason is that the business experiences and services of the organizations are multi-functional which can be shared by other organizations. Based on the above reason MOHA soft drink S. C, Asku plc, and Alle Bejimla, are found appropriate and suitable to conduct this study.

Choosing the type of sampling technique depends upon the area of research, research methodology, and preference of the researcher. For this research, a purposive sampling technique was used. Purposive sampling was considered appropriate as only those who supposed to have the information required for the study were targeted. In the study, the sample units must have the potential and richness in information to be key informants for the study. First, prior discussions were made with the ERP project managers, IT staff, and different stakeholders in both case companies. Project managers, team leaders, super users, project members, and IT staff with their regular role from non-management, subject matter experts, and management are included as a target for the survey.

Twenty-three individuals were selected purposely to answer survey questionnaires in case organization one, fifty-nine individuals were selected as respondents for the survey questionnaire in case organization two, and Thirty-nine individuals were purposely selected in case company three. In case organization one twenty-one valid data were collected, in case of organization two fifty-four questioners filled and returned, and thirty-six valid data were collected in case organization three. In general, 121 survey questioners were distributed and from 121 questioners 111 are filled and returned while ten of them returned the questioners blank. These individuals are selected as key informants and respondents based on their involvement, exposure, and role in the ERP project and functional role in the company.

### **3.5. Data Collection Techniques**

The collection of data is determined according to the methodological approach used. Because the use of a quantitative analytical approach has been defined in this report, data collection within this study has been conducted using a single data collection methodology, the questionnaire, and a

corresponding examination of that type of procedure. Primary sources of data from this study are survey questions, while secondary sources of data are analyses of documents, literature, and the Internet.

### **3.5.1. Survey Questionnaire**

Survey Questionnaire the principal source of primary data in this study. Preliminary discussions were made with project managers and members. The purpose of the study was explained to them. After this, respondents were classified based on their role in the ERP project and the company. They are project managers, team leaders, super users, project members, IT staff, and business process staff.

A questionnaire was developed for this study. The draft of the questionnaire items was extracted from previous research studies and adapted for this research example (Sintayehu (2014), Abdi (2017), and Saron (2017)). Each respondent received the introductory letter explaining the research briefly and required clarification of what critical success factors were described within the context of the analysis in implementing the ERP. That was in order, once again, to prevent ambiguity when answering the respondents' questions. Then, the nine close-ended questions within the survey were answered with a rating scale of Likert. The respondents replied by choosing one of the five viable options where one means strongly agree, two mean to agree, three mean neither agree nor disagree, four disagree, and five strongly disagree.

### **3.5.2. Documents and Internet**

Microsoft Dynamics NAV ERP systems user manual and the internet were reviewed and assessed as additional sources of data and for understanding the case study company and the ERP project. The organization's website was also assessed for the profile and history of the company. The researcher also reviewed procedures, action lists, test scripts, templates, and streams of original functions (production, finance, purchasing, sales, warehouse...) used in ERP implementation.

## **3.6. Data Analysis Procedures, Techniques and Tools**

Analysis of the collected data was done using the Statistical Package for Social Sciences (SPSS). First, by administering a questionnaire to an employee of MOHA soft drink S. C, Asku plc, and

Alle Bejmla, the researcher can gather the data needed. After that, rearranged, compiled, and measured data collected to become full data required for this analysis.

First, the data got are tested using the use of descriptive statistics, correlation, and regression. The descriptive statistics used to show the frequencies and percentages of the demographic variables.

Saunders et al. (2009) suggest that using descriptive statistics, a study can numerically identify and comparing variables, which is intended for a quantitative study. This review helped the author to use an initial description of data which could be part of a wider statistical analysis.

Correlation analysis was used to establish the relationship between the formulated hypothesis. As Bryman and Bell (2011) argued, there are a few different tools for the analysis of bivariate, that is when analyzing whether and how two variables are related. Decide which resources to do by interpreting the character of the variables. The researcher looked at the relationships between the successful implementation of ERP (dependent variables) and the eight critical success factors (independent variables).

Multiple linear regression analysis was also used to assess the relative value of each independent variable in describing the performance of the implementation of the Microsoft NAV ERP program. As already stated, respondents had to show their opinions across a set of values on a 5-point Likert scale ranging from Strongly Agree to Strongly disagree. The data will be analyzed and presented in the form of tabulation and graphical manner. This data analysis method was viable for this study since the researcher wanted to identify which critical success factors are important from prior research correlates with the project chartering phase of ERP implementation.

### **3.7. Validity**

Assessing the validity of questionnaires according to Saunders et al. (2009) relates to the capacity of the questionnaire to assess what is supposed to be measured. The measurement of validity refers specifically to quantitative analysis in a sample context and is concerned with whether a measure conceived of a definition represents the fact it would portray (Benbasat, 1987, Saunders et al., 2009).

The questionnaire was written and delivered in English that could be considered a worldwide standard business language. To avoid misinterpretations or the possibility of misunderstandings, I

applied the consistency of expression to make sure that every mentioned question and statement was easily comprehensible and mirrored this study's goal.

### 3.8. Reliability

Reliability is about the robustness of the questionnaire, therefore, whether the findings provided are consistent over time and under different circumstances, such as different samples and respondents. Mitchell (1996) outlines three specific approaches to calculating the questionnaire's reliability. The test-retest approach includes conducting a test or measure on one occasion and then retrieving it on another occasion to the same sample (Benbasat, 1987, Saunders et al., 2009). This process, however, can be problematic because the questionnaire has to be administered twice to the same respondents, and they may be reluctant to complete it twice. Because of the possibility of not getting the answers twice and because of the time constraints, the method was not chosen.

The next technique called by Mitchell (1996) is internal consistency and involves correlating the answers to the questions in the questionnaire with one another. The most widely used way of doing so is to calculate Cronbach's Alpha ( $\alpha$ ). The last approach outlined by Mitchell (1996) is the alternative form approach, which includes determining the reliability of the questionnaire by contrasting the answers to alternate versions of the same questions or question classes. This technique is usually used in longer questionnaires, however, and was inadequate in this analysis for the questionnaire, since it comprises just nine questions.

In this analysis, the internal consistency approach was used using the Cronbach Alpha ( $\alpha$ ) method to ensure the reliability of this report. This metric is often used to calculate the accuracy of the responses to a series of questions combined as scale. It comprises an Alpha element with a value between 0 and 1. The closer the coefficient in size of the products (variables) is to 1, the greater the internal consistency. This approach was suggested because a Likert-type scale was used on the questionnaire. For this study, therefore, the problem was critical as the hypotheses derived from literature research are being tested against that understanding. Also, the researcher acknowledges the transparency of this high-level research, since both the questionnaire and cover letter are open to any third party to take part. Most suitable to apply to scale reliability testing.

The researcher conducted the Cronbach's alpha reliability test by using SPSS (Statistical Package for the Social Sciences) and found that 86.7% of the responses from respondents are reliable as shown in table 4.

Reliability Statistics	
Cronbach's Alpha	N of Items
.869	9

Table 2: Reliability Statistics

### 3.9. Chapter summary

This study aimed to identify which factor critical success factors in the project chartering phase of Microsoft Dynamics NAV ERP system implementation. This chapter briefly outlined various methodologies that the study used in conducting this research and covers different approaches such as research model and hypothesis, research design, research strategy, data collection method, sampling method, and data analysis. It explained various scientific methods used to gather the data depending on the problem. Next chapter, chapter four will present data analysis and discussion.

# CHAPTER FOUR

## 4. DATA PRESENTATION AND ANALYSIS

This chapter presents the results of the study and interpretation of the findings. The chapter composed of two sections. The first part presents the profile of case organizations, and respondents showing gender, age group, level of education, work experience, and position of respondents. The second section presents the analysis of the study variables by using Correlation and Regression statistics. The total number of questionnaires distributed was 121, of which 92% (111) were filled and returned. So, they did the analysis based on 111 questionnaires answered.

### 4.1. Background of the Organizations

#### 4.1.1. ASKU PLC

ASKU PLC is a food and beverage manufacturing company established in 1999 by Ethiopian stakeholders under an investment group called ABIG that provides its services to a portfolio of companies in various sectors ranging from food and beverages, healthcare, petroleum chemicals, construction, real estate, and merchandising trading. It is a corporation manufactured sector to be Ethiopia's largest beverage industry. The bottled water manufacturing plant manufactures aquaddis as part of the PLC, a brand that many loves for its consistency and purity, is a market leader in the sector, and is distributed nationwide (Asku plc, 2020). ASKU plc. the bottled water production plant is in the Oromia Region, Burayu town along the Addis-Ambo road, just 19 km away from Ethiopia's capital city, Addis Ababa. ASKU PLC is one of Ethiopia's most successful and fast-growing food and beverage mills. The primary operation is the manufacture and distribution of multiple types of beverage products for the local markets in Ethiopia. Among the company's 1/2-liter, 1 liter, 2 liters & 20-liter mineral water bottled Aquaddis is the initial product when entering the market (Asku plc, 2020). The company also manufactures CSD (Carbonated Soft Drinks) such as RC Lemon, RC Lime, RC Tonic, RC Cola products franchised from North America. Asku plc is continuing to bring its suitable name to other business expanding sectors and has started mango juice, Ethiopicana juice, and natural mineral water, Sparkling mineral water brand (Asku plc, 2020).

They decided to re-engineer and automate the current process of the company and implement an ERP system, to improve performance, to accomplish their goals and strengthen their position in the market. The Microsoft Dynamics NAV ERP selection process at ASKU plc started in August 2016, and they are fully implemented around six modules. These are purchase and supply, sales and marketing, transfer, finance, human resource, and payroll.

#### **4.1.2. MOHA Soft Drink SC**

Mohamed Hussain Al-Amoudi (MOHA) Soft Drinks Industry S.C. was created on 15 May 1996 and registered under the Ethiopian Commercial Code. This company was founded after the acquisition of four plants in Addis Abeba (Nefas Silk & T / Haimanot), Gondar and Dessie, purchased on 18 January 1996 by an investor called Sheikh Mohammed H. Al-Amoudi, through an offer provided by the Ethiopian Privatization Agency with Birr 108,654,000 paid-in cash. This was nationalized in 1975 and began production of Pepsi Cola, Mirinda, and Temberands in January 1978, replacing the old line. The organization has seven operating units including Summit Plant, Bure Plant, and the newly inaugurated Hawassa Plant in the People's Region of Southern Nations & Nationalities. In terms of size and production capacities, the various divisions around the country have different capabilities. MOHA Soft Drinks Industry S.C.'s principal products are Pepsi Cola (cola flavor), Mirinda Strawberry, 7-Up (lemon flavor), Mirinda Tonic, Mirinda Apple (all Pepsi brands), and Kool (Bure Kool and Tossa bottled water products) (Moha, 2020). It provides 2485 jobs for people, 1095 of which are fresh work opportunities since the acquisition, and the company's annual turnover has reached Birr 556 million and the average annual growth rate for sales is 556 million.

MOHA has 52 percent of the country's market share in soft drinks. The production capacity of the plants has exploded with an extension and replacement of obsolete equipment (Moha, 2020). Besides the Soft Drinks factory's initial purchase price, MOHA has spent Birr 8 million to expand new facilities, Birr 153 million for the rehabilitation and reconstruction of existing plants and Birr 241 million for advertisement, services, excluding publicity and sponsorship expenses. Major growth has also been achieved by the reorganization of operations over the years of production, revenues, and profitability. With substantial cost savings, efficiency has increased immensely and guaranteed a daily supply of high-quality goods. It has also entered new market areas throughout

the world (Moha, 2020). Their future strategy raises sales volume and related income growth by an average of 15 percent per annum. They have started new projects, such as Summit and Adigrat Pepsi Cola Bottling Factory, to fulfill their plan (Moha, 2020). They decided to re-engineer and automate the current process of the company and implement an ERP system, to improve performance, to accomplish their goals and strengthen their position in the market. The Microsoft Dynamics NAV ERP selection process in MOHA soft drink SC company at T / Haimanot plant started in September 2014 and the following modules which are fully implemented in MOHA soft drink company. These are purchase and supply, sale and marketing, finance, human resource and payroll, manufacturing, quality, and garage.

### **4.1.3. Alle Bejimla**

It was founded back in 2013, Ethiopian Trading Enterprise to build modern and efficient trading practices and became operational in May 2014 with the trade name of Alle Bejimla, its first store was inaugurated by Prime Minister Hailemariam Dessalegn at Megnenagna, in Bole District, close to the automotive company AMCE. Ethiopian business trading corporation previously known as an Ethiopian trading enterprise. Alle Bejimla used three previously owned wholesale outlets of the state-owned Merchandise Wholesale & Import Trade Enterprise in the Megnenagna, Kaliti, and Mercato districts. These three stores were once a part of Merchandise Wholesale & Export Trade Enterprise (Fortune, 2020). The Ethiopian government has moved to create the Ethiopian business trading corporation over top inflation concerns that are caused by a lack of competition on the wholesale market in the country. Alle Bejimla is poised for a national expansion after a trial of the three wholesale outlets in Addis Abeba, with 36 wholesale outlets expected throughout the country within 27 months (Fortune, 2020).

Alle Bejimla has four principal clients in government and private institutions: supermarkets, customer associations, hotels, and trade unions. And it provides a range of foods, grocery shops, snacks, drinks, personal services, cleaning goods, and sanitary items to customers. It has 3,000 clients who regularly purchase the aforementioned commodities. Of the total number, 2,248 are retailers, 145 are customer groups, 114 are trade unions of government and private institutions, and the rest are hotels, restaurants, and cafeterias (Fortune, 2020). Alle Bejimla, also known as Alle, started operations through a business-to-business model that focuses on supplying products

to businesses such as kiosks, cafes, and hotels. The government launched the one-billion-birr project because of concerns about the lack of competition in the country's wholesale market that triggered runaway inflation (Fortune, 2020). They decided to re-engineer and automate the current process of the organization and implement an ERP system, to improve performance, and to accomplish their goals. The Microsoft Dynamics NAV ERP selection process at Alle Bejimla started in 2014 and the following modules which are fully implemented in Alle Bejimla. These are purchase and supply, point of sales, warehouse, finance, IT administration, transfer, human resource, and payroll.

#### 4.2. Background of the Respondents

The first part of the questionnaire comprises the background information of the companies and the respondents, which represent ERP users at the three organizations. The variables are described and summarized in the subsequent sections using charts and tables.

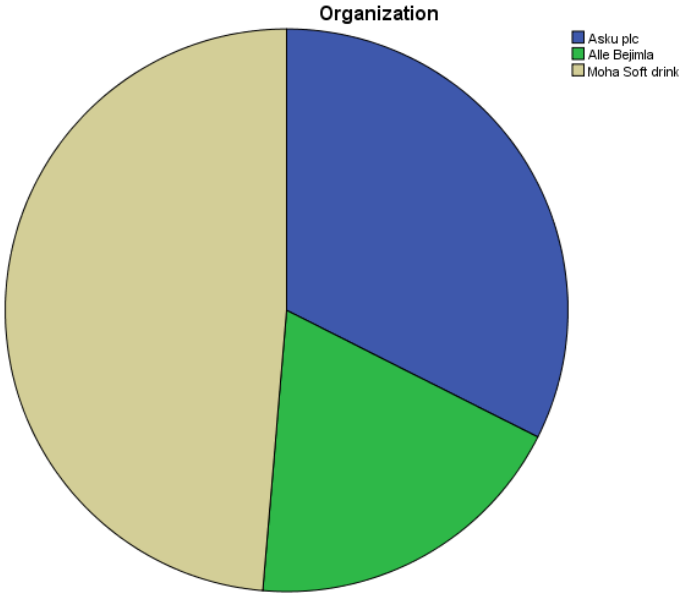


Chart 1: location of the respondents

As stated in the above chart, 48.6% (54) of the respondents are working at MOHA soft drink and the rest 18.9% (21) and 32.4% (36) are worked at Alle Bejimla and Asku plc, respectively.

### 4.3. Demographic characteristics of the respondents

Descriptive analysis is used to look at the collected data and to identify the demographic characteristics. It is used to provide further detail on the demographic factors. Making some general observations about the data collected for general or demographic questions is of primary importance. Demographics factors included in this study were gender, age group, and service year of the organization and the various levels of education of respondents, and the position of a different employee of the organizations. So, it is expressed in the following session independently.

Respondents	Classification	Frequency	Percent
Gender	Male	66	59.5
	Female	45	40.5
	Total	111	100
Age Group	<=25	13	11.7
	26-35	64	57.7
	36-40	27	24.3
	41 and Above	7	6.3
	Total	111	100
Educational Status	Diploma	12	10.8
	BA/BSC	86	77.5
	Masters & Above	13	11.7
	Total	111	100
Service Year	<=3	22	19.8
	4-10	58	52.3
	11-15	31	27.9
	Total	111	100.0
Position	Project manager	7	6.3
	Super User	44	39.6
	IT staff	17	15.3
	Team Leader	11	9.9
	Project Member	9	8.1

	Business Process Staff	13	11.7
	Other	10	9.0
	Total	111	100.0

Table 3: Respondents by gender, age group, work experience, educational status, position

Based on the collected data, 59.5% (66) of the respondents were male while only 40.5% (45) were female. Concerning age status, 57.7% (64) of the employees are between the age of 26 and 35, while 24.3% (27) were at the age of between 36 and 40. The other 11.7% (13) of the respondents were at 25 and below. Furthermore, 6.3% (7) of the respondents were at the age of 41 and above.

Regarding the educational level of employees of the organizations, 10.8% (12) of the employees are diploma holders and the other 77.5% (86) of the employees are the first-degree holder, whereas the remaining 11.7% (13) is covered by specialization at a master’s degree level. Therefore, most of the employees have at least first-degree holders. As a result, respondents can easily understand the questions and have enough knowledge about the subject of the research.

As illustrated in the above table, most of the employees have relatively longer existence in the company. And to be specific, 19.8% of the respondents have been working with the company for three years and below, whereas 52.3% of the respondents have been working with the company for at least 4 to 10 years. The other 27.9% of the respondents have been working with the company for at least 11 up to 15 years. Most of the respondents have passed through the different stages of ERP software implementations practice held in the organizations. They have vital knowledge and experience about the challenges and the status of the ERP system. As a result, it would be clear that the probability of getting diverse, firsthand and reliable information is high.

Regarding the position of the respondents, the majority (39.6%) of the respondents are a user’s, 6.3% of the respondents are project managers, 9.9% of the respondents are team leaders, and 15.3% of the respondents are IT staff. Furthermore, 8.1% and 11.7% of the respondents are project members and Business Process Staff. On the other hand, 9% of the respondents are in other positions. This shows that the greater part of the respondent in this study were experts working on the Microsoft Dynamics NAV ERP system in the organizations.

## 4.4. Results and Analysis of Hypotheses

To examine the relationship between independent variables of the research model regarding dependent variables Microsoft NAV ERP system implementation success, Pearson correlation analysis was done for better understanding of the association between the variables and Multiple linear regression analysis was used to measure how much the impact of independent variables on the dependent variable. However, it helps to presents the results of hypothesis testing and understanding of the results.

The hypothesis testing was done to measure independent variables (project champion, project management, business plan and vision, top management involvement, ERP team, and composition, appropriate business and Legacy systems, effective communication, and change management) that influence the dependent variable (Microsoft Dynamics NAV ERP system implementation success). For the Pearson correlation analysis, the hypothesis accepted by considering the P- value less than 0.05.

### 4.4.1. Pearson correlation analysis

A Pearson correlation coefficient analysis used to examine the relationship between the independent variable (project champion, top management support, project management, business plan and vision, ERP team, and composition, effective communication, appropriate business and legacy, and change management) and dependent variable (NAV ERP system implementation success). And it describes the effect of independent variables on the dependent variable.

#### 4.4.1.1. Project Management

		Project Management	NAV ERP Implementation Success
Project Management	Pearson Correlation	1	.298**
	Sig. (2-tailed)		.001
	N	111	111
NAV ERP Implementation Success	Pearson Correlation	.298**	1
	Sig. (2-tailed)	.001	
	N	111	111

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

Table 4: Correlation analysis between Project management and NAV ERP implementation success

The following statistical hypothesis was tested:

Hypothesis1: Project Management is a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation.

The first hypothesis tested the perception of whether the project management could be considered as a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation success or not. As indicated in the above table the Pearson correlation coefficient gave a P=0.001 result of 0.298, meaning it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$ , and the hypothesis is hence accepted. The critical success factor of project management is considered to have a relationship with success in a NAV ERP implementation.

#### 4.4.1.2. Project Champion

Correlations			
		Project Champion	NAV ERP Implementation Success
Project Champion	Pearson Correlation	1	.409**
	Sig. (2-tailed)		.000
	N	111	111
NAV ERP Implementation Success	Pearson Correlation	.409**	1
	Sig. (2-tailed)	.000	
	N	111	111

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

Table 5: Correlation analysis between Project champion and NAV ERP implementation success

The following statistical hypothesis was tested:

Hypothesis2: Project Champion is a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation.

The second hypothesis tested whether the project champion could be considered as a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation success or not. As indicated from the above table the Pearson correlation coefficient gave a result of 0.409 at P=0.001, meaning it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$ , and the hypothesis is hence accepted. The critical success factor of project champion is considered having a relationship with success in an ERP implementation in the project chartering phase.

#### 4.4.1.3. Top Management Support

		<b>Correlations</b>	
		Top Management	NAV ERP Implementation Success
Top Management	Pearson Correlation	1	.454**
	Sig. (2-tailed)		.000
	N	111	111
NAV ERP Implementation Success	Pearson Correlation	.454**	1
	Sig. (2-tailed)	.000	
	N	111	111

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

Table 6: Correlation analysis between top management and NAV ERP implementation success

The following statistical hypothesis was tested:

Hypothesis3: Top Management Support is a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation.

The third hypothesis tested whether the top management support could be considered as a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation success. As indicated from the above table the Pearson correlation coefficient gave a P=0.001 result of 0.454, meaning it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$ , and the hypothesis is hence accepted. There is a statistical importance correlation between the success of an ERP implementation and the support and involvement of the top management in the project's chartering stage.

#### 4.4.1.4. ERP team and Composition

		Correlations	
		ERP team and composition	NAV ERP Implementation Success
ERP team and composition	Pearson Correlation	1	.597**
	Sig. (2-tailed)		.000
	N	111	111
NAV ERP Implementation Success	Pearson Correlation	.597**	1
	Sig. (2-tailed)	.000	
	N	111	111

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

Table 7: Correlation analysis between ERP team and composition and NAV ERP implementation success

The following statistical hypothesis was tested:

Hypothesis4: ERP team and Composition is a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation.

The fourth hypothesis tested whether the ERP team and composition could be considered as a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation success. As indicated from the above table the Pearson correlation coefficient gave a P=0.001 result of 0.597, meaning it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$ , and the hypothesis is hence accepted. During the project chartering stage, there is a statistically important link between performing a Microsoft Dynamics NAV ERP implementation and ERP team and composition.

#### 4.4.1.5. Business plan and vision

**Correlations**

		Business plan and vision	NAV ERP Implementation Success
Business plan and vision	Pearson Correlation	1	.323**
	Sig. (2-tailed)		.001
	N	111	111
NAV ERP Implementation Success	Pearson Correlation	.323**	1
	Sig. (2-tailed)	.001	
	N	111	111

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

Table 8: Table: Correlation analysis between business plan and vision and NAV ERP implementation success

The following statistical hypothesis was tested:

Hypothesis5: Business plan and vision is a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation.

The importance of the business plan and vision in a project chartering phase of NAV ERP system implementation success was the fifth hypothesis being tested. The Pearson correlation coefficient showed a value of 0.323 at P=0.001 according to the results of the above table which means it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$  and the hypothesis is hence accepted. There is a statistically important link in the project chartering stage between the progress of an ERP implementation and Business plan and vision.

#### 4.4.1.6. Effective communication

		Correlations	
		Effective communication	NAV ERP Implementation Success
Effective communication	Pearson Correlation	1	.442**
	Sig. (2-tailed)		.000
	N	111	111
NAV ERP Implementation Success	Pearson Correlation	.442**	1
	Sig. (2-tailed)	.000	
	N	111	111

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

Table 9: Correlation analysis between effective communication and NAV ERP implementation success.

The following statistical hypothesis was tested:

Hypothesis6: Effective communication is a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation.

The sixth hypothesis measured the association of effective communication in NAV ERP implementation in the chartering phase. The Pearson correlation coefficient showed a value of 0.442 at P=0.001, according to the results of the above table which means it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$ , and the hypothesis is hence accepted. There is a statistically important link in the project chartering stage between the progress of an ERP implementation and effective communication.

#### 4.4.1.7. Legacy System Consideration

		Correlations	
		Legacy systems consideration	NAV ERP Implementation Success
Legacy system consideration	Pearson Correlation	1	.431**
	Sig. (2-tailed)		.000
	N	111	111

NAV ERP Implementation	Pearson Correlation	.431**	1
Success	Sig. (2-tailed)	.000	
	N	111	111

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

Table 10: Correlation analysis between Legacy system consideration and NAV ERP implementation success.

The following statistical hypothesis was tested:

Hypothesis7: Legacy system consideration are a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation.

The seventh hypothesis tested the perception of whether the Legacy system consideration could be considered a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system or not. As indicated from the above table, the Pearson correlation coefficient showed a result of 0.431 at a significance level of 0.001, so it is statistically relevant at  $p < 0.05$  and therefore the hypothesis is accepted. The critical success factor of legacy system consideration is considered to have a relationship with success in an ERP implementation.

#### 4.4.1.8. Change Management

		Change Management	NAV ERP Implementation Success
Change Management	Pearson Correlation	1	.534**
	Sig. (2-tailed)		.000
	N	111	111
NAV ERP Implementation Success	Pearson Correlation	.534**	1
	Sig. (2-tailed)	.000	
	N	111	111

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

Table 11: Correlation analysis between change management and NAV ERP implementation success

The following statistical hypothesis was tested:

Hypothesis8: Change Management is a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system implementation.

The eighth hypothesis tested the perception of whether change management could be considered a critical success factor in the project chartering phase of the Microsoft Dynamics NAV ERP system. As shown from the table above, the Pearson correlation coefficient showed a result of 0.534 at a meaning level of 0.001, So it is statistically relevant at  $p < 0.05$  and therefore the hypothesis is accepted. The critical success factor of change management is considered to have a relationship with success in an ERP implementation.

#### 4.4.1.9. Research Model correlation analysis Result

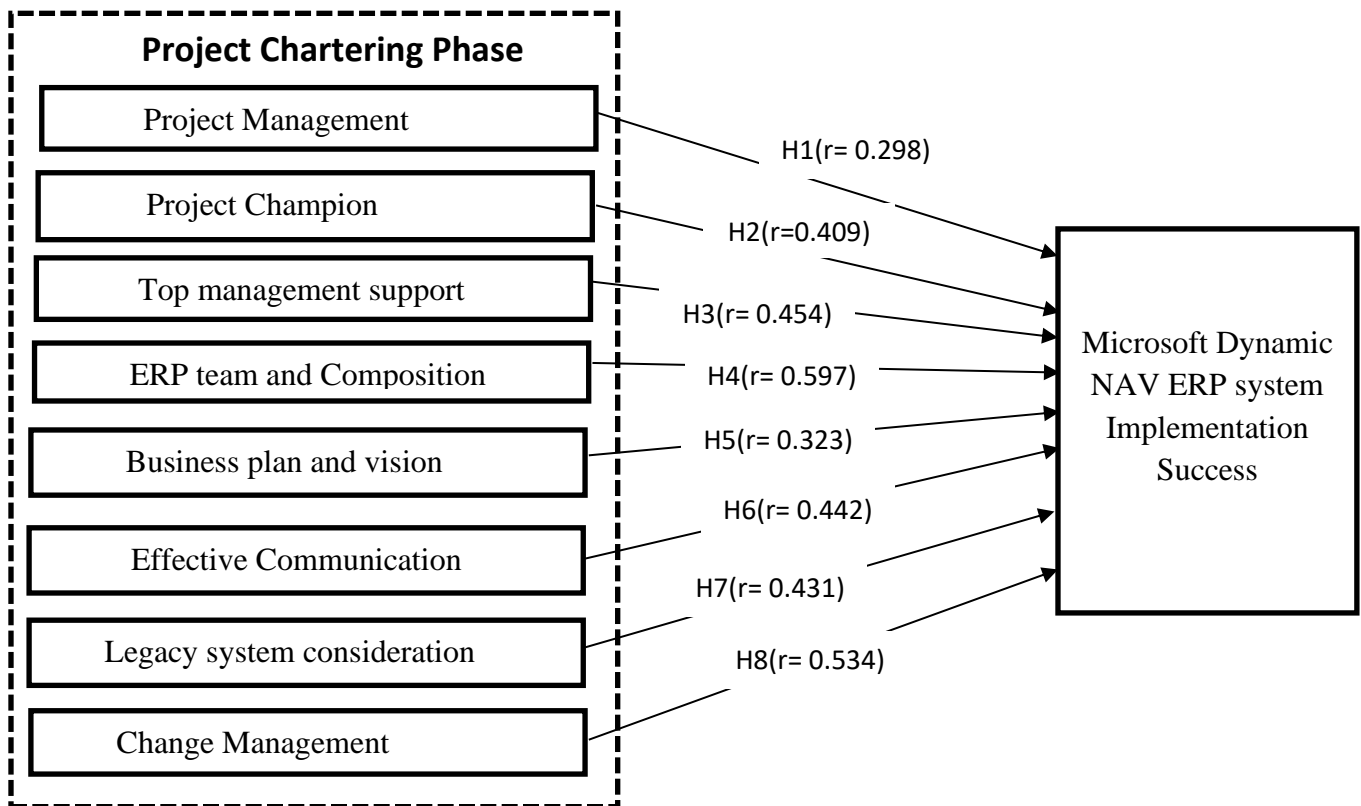


Figure 7: Analysis results for the research model

The results of the hypothesis testing were presented in the figure above shows that all the independent variables (project champion, top management support, project management, business plan and vision, ERP team, and composition, effective communication, legacy system

consideration, and change management) are associated with Microsoft Dynamics NAV ERP system implementation success in the project chartering phase.

#### 4.4.2. Multiple linear regression analysis

Multiple linear regression analysis is a modeling technique, which can understand the impact of one or more independent variables on a dependent variable. It tells that what contribution has those independent variables make to the variance in the dependent variable or how much variance do the independent variables explained in the dependent variable.

In this research, there are eight different independent variables associated with the NAV ERP implementation success. This section investigates how the independent factors act together to affect the dependent variables by using multiple linear regression analysis.

##### 4.4.2.1. Multiple Linear regression assumptions

Multiple regression extends simple linear regression. It is used when we want to predict the value of a dependent variable (or sometimes, the predictor, explanatory, or regressor variables) based on the value of two or more independent variables. The variable the researcher wants to predict is Microsoft Nav ERP implementation success while the variables used to predict the value of the dependent variable are project management, project champion, top management support, business plan and vision, effective communication, ERP team, and composition, Legacy system consideration, and change management.

There are several assumptions when running a Multiple linear Regression that you need to test that your data meets so your study can be accurate. These are:

**Multicollinearity:** Your data lacks multicollinearity. That is essentially the belief that your predictors are not too closely correlated with each other (StatisticsSolutions, 2020).

The Collinearity statistics were included in detecting multicollinearity. The tolerance represents the percentage of the variance in a predictor that the other predictors cannot describe, the tolerance scores being above 0.2 (StatisticsSolutions, 2020). Variance Inflation Factor (VIF) of the multiple linear regression shows the degree that the variances in the regression estimates are increased because of multicollinearity. VIF values higher than 10 show that multicollinearity is a problem

(StatisticsSolutions, 2020). Thus, all the predictor's result is less than 10 and overall, the regression model looks fine.

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Project Champion	.514	1.944
	Project Management	.499	2.002
	Business plan and vision	.603	1.660
	Top Management	.516	1.936
	ERP team and composition	.576	1.737
	Effective communication	.472	2.117
	Legacy system consideration	.490	2.041
	Change Management	.541	1.848

Dependent Variable: NAV ERP Implementation Success

Table 12: Collinearity statistics

**Autocorrelation:** It is the degree to which the values of the same variables correlate across different observations in the data. Here, the researcher uses the Durbin-Watson statistic to test the assumption that the residuals are independent (or uncorrelated). This statistic can vary from 0 to 4. For this assumption to be met, the Durbin-Watson value to be close to two. Values less than one and above three are cause for concern, and your analysis is invalid.

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.688 <sup>a</sup>	.474	.433	.63585	1.832

a. Predictors: (Constant), Change Management, Project Management, Business plan and vision, Effective communication, Top Management, ERP team and composition, Project Champion, Legacy system consideration

b. Dependent Variable: NAV ERP Implementation Success

Table 13: Durbin-Watson statistic

Here, the value is 1.832, so this assumption has been met.

**Linearity test:** The relationship between the independent and dependent variables needs to be linear with multiple linear regression. Since multiple linear regression is susceptible to outlier effects, it is also important to check for outliers and the linearity assumption can best be checked using scatter plots.

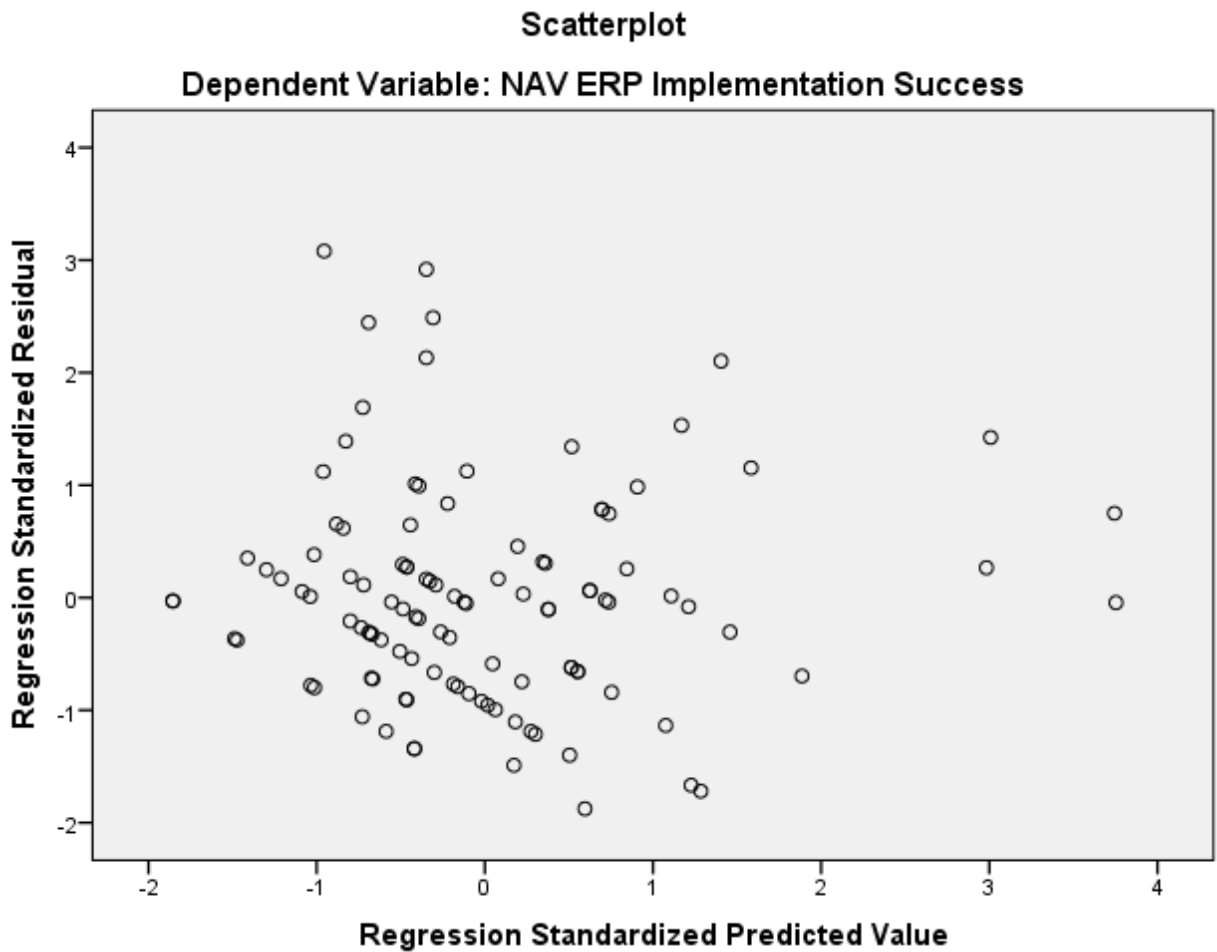


Chart 2: Linearity test Using Scatterplots

**Influential outliers:** Significant outliers and prominent data points will affect your model excessively, making it less reflective of your data. For each participant, this includes Cook's Distance Statistic. Some values above 1 are likely to be major outliers, which could have an excessive impact on the model, and therefore should be excluded and the experiment re-run.

**Residuals Statistics**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.0187	4.2781	2.0968	.58120	111
Std. Predicted Value	-1.855	3.753	.000	1.000	111
Standard Error of Predicted Value	.094	.303	.174	.049	111
Adjusted Predicted Value	1.0196	4.2836	2.1035	.58034	111
Residual	-1.19266	1.95840	.00000	.61229	111
Std. Residual	-1.876	3.080	.000	.963	111
Stud. Residual	-1.918	3.149	-.005	1.002	111
Deleted Residual	-1.36048	2.04688	-.00670	.66421	111
Stud. Deleted Residual	-1.944	3.298	-.001	1.017	111
Mahal. Distance	1.416	23.967	7.928	5.103	111
Cook's Distance	.000	.100	.010	.017	111
Centered Leverage Value	.013	.218	.072	.046	111

a. Dependent Variable: NAV ERP Implementation Success

Table 14: Residuals Statistics

Here, Cook's Distance values were all under 1 (As stated in the above table min=0.000 and max=.100), suggesting individual cases were not excessively influencing the model.

#### 4.4.2.2. Model Test

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.688 <sup>a</sup>	.474	.433	.63585

a. Predictors: (Constant), Change Management, Project Management, Business plan and vision, ERP team and composition, Legacy system consideration, Top Management, Project Champion, Effective communication

Table 15: Model test in multiple linear regression analysis

R<sup>2</sup> is the proportion of variance that can be explained by the independent variables within the dependent variable. As stated in the above table, R<sup>2</sup> of regression on the eight success factors (Change Management, Project Management, Business plan and vision, Effective communication, Top Management, ERP team and composition, Project Champion, Legacy system consideration) was .474, showing that the combination of these factors has approximately 47.4% of the impact on the dependent variable (NAV ERP implementation success).

### 4.4.2.3. Statistical significance

**ANOVA<sup>a</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	37.157	8	4.645	11.488	.000 <sup>b</sup>
Residual	41.239	102	.404		
Total	78.396	110			

a. Dependent Variable: NAV ERP Implementation Success

b. Predictors: (Constant), Change Management, Project Management, Business plan and vision, ERP team and composition, Legacy system consideration, Top Management, Project Champion, Effective communication

Table 16: ANOVA analysis NAV ERP implementation success

In the above ANOVA table, the F statistic tests whether the overall regression model is a suitable fit for the data. The table shows that the independent variables statistically significantly predict the dependent variable, the computed F statistic 11.48,  $p < .0005$ , so this shows the regression model is a suitable fit for the data.

### 4.4.2.4. Result of Multiple Linear Regression analysis

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.119	.230		.517	.606
Project Champion	.077	.087	.088	.880	.381
Project Management	-.065	.085	-.077	-.755	.452
Business plan and vision	.050	.092	.050	.545	.587
Top Management	.132	.102	.130	1.296	.198
ERP team and composition	.392	.099	.375	3.965	.000
Effective communication	.020	.101	.020	.196	.845
Legacy system consideration	.071	.093	.079	.765	.446
Change Management	.223	.098	.222	2.278	.025

a. Dependent Variable: NAV ERP Implementation Success

Table 17: Result of Regression analysis

In this table, B values show the coefficients and constant for the regression equation that measures predicted value for NAV ERP Implementation success, although beta values refer to standardized regression coefficients that allow the variable weights to be compared equally. The t value refers to the value of B divided by the standard error of B. Among the predictors' factors ERP team and

composition has highly predicted value to the NAV ERP implementation success which means 1% changes on the ERP team and composition; NAV ERP implementation success will increase by 39.2%. Also, 1% changes in the change management and top management have an impact with 22.3%, and 13.2% respectively which are also relatively high predicted values. However, the remaining factors project champion, legacy system consideration, business plan and vision, effective communication and project management has relatively low predicted value with 7.7%, 7.1%, 5.0%, 2.0%, and -0.65 respectively.

Therefore, Top management support and involvement, ERP team and composition, and Change management have high Predicted values and the most important contributor of Microsoft Dynamics NAV ERP Implementation success. Thus, these factors are key critical success factors that should be taken into consideration in selected case companies (Asku plc, MOHA soft drink, and Alle bejmla) for the successful implementation of the Microsoft Dynamics NAV ERP system from the project chartering phase.

Besides, those two independent variables (ERP team and composition, and Change management) have a significant impact on Microsoft Dynamics NAV ERP implementation success, but the analyzed data did not show the significant impact between the remaining six factors (i.e., Project Champion, Business plan and vision, Project Management, Legacy system consideration, Effective communication, Top management support, and involvement) with the successful implementation of Microsoft Dynamics NAV ERP system as shown the result on the above table.

#### **4.5. Discussion**

Based on the data analysis result, the researcher found two critical success factors are identified as more critical responsibility for the success of Microsoft Dynamics ERP implementation for the project chartering phase. The study aims to find out those critical success factors that have more association and effect on the implementation of the Microsoft Dynamics NAV ERP system in the project chartering phase. The following critical success factors have more association and effect on the implementation of the Microsoft Dynamics NAV ERP system in the project chartering phase. These are:

- ✚ People-related factor (ERP team and compositions)
- ✚ Management-related factor (Change Management)

## Discussion on management-related factors

### Change management

Change Management has a significant relationship with the successful implementation of NAV ERP systems (0.001 Sig. level). Pearson correlation was used to test the level of association between the independent variable (change management) and dependent variable Microsoft Dynamics NAV ERP system implementation success. There was a moderately strong, correlation between the ERP team and composition and Microsoft Dynamics NAV ERP system implementation success. As indicated in the above table 13, the Pearson correlation coefficient showed a result of 0.534 at a significance level of 0.001, which means it is statistically important at  $p < 0.05$ . When we come to multiple linear regression analysis results among the predictors change management variable has highly predicted significance for the success of NAV ERP implementation which means 1 percent improvement in change management, the success of NAV ERP implementation will increase by 22.3 percent. This result supports the findings of previous research conducted by different researchers (Foziya, 2017; Julie & Jonathan, 2008; Parr & Shanks, 2000; Saron, 2017). the importance of this factor to successfully implement the ERP System in the organization. Role of Change Management is Change the Dynamics of the organization to ensure the new system succeeds by ensuring there is a readiness to the demands of a very hard taskmaster, Educate users in current industry best practices and vigorously train them in the technical uses of the system, An ERP implementation project is a long and arduous endeavor. However, change management is considered being critical when implementing a Microsoft NAV ERP system in the project chartering phase.

### Project management

A Pearson correlation was used in this analysis to check the degree of association between successful implementation of the independent variable (project management) and dependent variable Microsoft Dynamics NAV ERP system. There was relatively low, correlation between the project management and Microsoft Dynamics NAV ERP system implementation success. As indicated in the above table the Pearson correlation coefficient gave a  $P=0.001$  result of 0.298, meaning it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$ , and the hypothesis is hence accepted. The critical success factor of project management is

considered to have a relationship with success in a NAV ERP implementation. However, the multiple linear regression analysis results show that among the predictors' factors project management has a relatively lower predicted value with -6.5% and the P-value is greater than 0.05. There is no statistically significant link in the project chartering stage between the progress of an ERP implementation and project management.

ERP implementing organizations should have an appropriate project management plan for managing the implementation process, preventing budget overruns, and ensuring timely implementation. As stated, previous work has stressed that project management helps to organize the activities in the chartering stage of the project in implementing ERP. The survey results reflect similar findings with the study of (Saron, 2017; Parr & Shanks 2000) who found that project management is not a critical success factor in the project's chartering phase of ERP implementation.

#### Project Champion

A Pearson correlation was used in this analysis to check the degree of association between successful implementation of the independent variable (project champion) and dependent variable Microsoft Dynamics NAV ERP system. There was relatively medium, correlation between the project champion and Microsoft Dynamics NAV ERP system implementation success. As indicated from the above table the Pearson correlation coefficient gave a result of 0.409 at  $P=0.001$ , meaning it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$ , and the hypothesis is hence accepted. The critical success factor of project champion is considered having a relationship with success in an ERP implementation in the project chartering phase. However, the multiple linear regression analyses result show that project champion has relatively low predicted value with 7.7% and the P-value is greater than 0.05. This indicated that there is no statistically significance between project champion and Microsoft Dynamics NAV ERP system implementation in the project chartering phase.

A project champion is a committed supporter of the project management ERP and is important in the project chartering process for better and faster cooperation within the project team. The principal tasks of the project champion are to be the first contact person for questions relating to the ERP project and to ensure the success of the project within the organization. The survey results

reflect similar findings with the study of (Parr & Shanks,2000; Sayegh, 2010; Julie & Jonathan, 2008) who found that project champion is not a critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP implementation system.

#### Top management support and involvement

In this study, the researcher implemented correlation analysis to know the association between the independent variable (top management support and involvement) with the dependent variable (Microsoft Dynamics NAV ERP system implementation) in the project chartering phase. The researcher also used multiple linear regression analyses to know the effect of the independent variable on the dependent variable Microsoft Dynamics NAV ERP implementation system in the project chartering phase. As indicated in the above table 8, the Pearson correlation coefficient showed a result of 0.454 at  $P=0.001$ . This result shows that there is a statistically significant correlation between the success of a NAV ERP system implementation and the top management support and involvement in the project chartering phase. This means top management support and involvement have moderately strong associations with ERP system implementation in the project chartering phase at  $r= 0.454$ . On the other hand, the multiple linear regression analysis results show that among the predictors' factors top management support and involvement has highly predicted value to the NAV ERP implementation success which means 1% changes on the top management support and involvement, NAV ERP implementation success will increase by 13.2%, but the P-value of this factor is greater than 0.05 this shows there noa statistically significant between the success of a Microsoft Dynamics NAV ERP system implementation and Top management support and involvement in the project chartering phase.

Top management support and involvement should not concern in the chartering phase of the Microsoft NAV ERP implementation. This result supports the findings of previous research conducted by different researchers (Abdi, 2017; Julie &Jonathan, 2008). Finally, the hypothesis is rejected and Top management support and involvement is not a critical success factor in the project chartering phase of the Microsoft Dynamics NAV ERP system.

#### Business plan and vision

In this study, the researcher implemented correlation analysis to know the association between the independent variable (business plan and vision) with the dependent variable (Microsoft Dynamics

NAV ERP system implementation) in the project chartering phase. The researcher also used multiple linear regression analyses to know the effect of the independent variable on the dependent variable Microsoft Dynamics NAV ERP implementation system in the project chartering phase. The Pearson correlation coefficient showed a value of 0.323 at  $P=0.001$  according to the results of the above table which means it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$  and the hypothesis is hence accepted. There is a statistically important link in the project chartering stage between the progress of an ERP implementation and business plan and vision. However, the multiple linear regression analyses result show that business plan and vision have relatively low predicted value with 5.0% and the P-value is greater than 0.05.

Business plan and vision are not a critical success factor for the Microsoft Dynamics NAV ERP implementation system in the project chartering phase. This result supports the findings of previous research conducted by different researchers (Parr & Shanks,2000; Abdi, 2017). In the chartering phase, a clear business plan and vision are needed throughout the ERP life cycle to steer the direction of the project. There should be a clear business model, a justification of investment, a project mission, and identified goals and benefits.

#### Effective Communication

In this study, a Pearson correlation was used to test the level of association between the independent variable (Effective communication) and dependent variable Microsoft Dynamics NAV ERP system implementation success. There was moderate, a medium, correlation between the ERP team and composition and Microsoft Dynamics NAV ERP system implementation success. The Pearson correlation coefficient showed a value of 0.442 at  $P=0.001$ , according to the results of the above table which means it is statistically important that P-value less than our chosen significance level  $\alpha = 0.05$ , and the hypothesis is hence accepted. There is a statistically important link in the project chartering stage between the success of a Microsoft Dynamics NAV ERP implementation and effective communication. When we come to multiple linear regression analysis results among the predictors' factors effective communication has a relatively lower predicted value with 2.0% and the P-value is greater than 0.05. There is no statistically significant link in the project chartering stage between the progress of an ERP implementation and effective communication.

This finding is consistent with the outcomes of studies carried out by other researchers (Julie & Jonathan, 2008; Parr & Shanks, 2000, Sisay, 2018). With effective communication, there is a structured manner for employees to find out what is happening in the company. During project chartering phase in the ERP implementation projects, a coordinated communication plan is an efficient way to explain the goals, timelines, benefits, and popular ideas, and that regular reports to executive levels are essential. However, effective communication is not a critical success factor for the Microsoft Dynamics NAV ERP implementation system in the project chartering phase.

#### Discussion on people-related factors

##### ERP team and Composition

In this study, a Pearson correlation was used to test the level of association between the independent variable (ERP team and composition) and dependent variable Microsoft Dynamics NAV ERP system implementation success. There was moderately, a strong, correlation between the ERP team and composition and Microsoft Dynamics NAV ERP system implementation success. The Pearson correlation coefficient showed a value of 0.597 at  $P=0.001$ , according to the results of the above table 9 so the P-value is statistically less than our chosen to mean level  $\alpha = 0.05$ . There is a statistically important link in the project chartering stage between the success of a Microsoft Dynamics NAV ERP implementation and ERP team and compositions. When we come to multiple linear regression analysis results among the predictors' factors ERP team and composition has highly predicted value to the NAV ERP implementation success which means 1% changes on the ERP team and composition, NAV ERP implementation success will increase by 39.2%. This result supports the findings of previous research conducted by different researchers (Loh & Koh, 2004; Bhagwani, 2009; Nah et al., 2001; Saron, 2017; Zewdu, 2016).

#### Discussion on Technical-related factors

##### Legacy system consideration

In this study, the researcher carried out a correlation analysis to know the relationship between the independent variable (legacy system consideration) and the dependent variable (implementation of the Microsoft Dynamics NAV ERP system) during the project chartering phase. The researcher also used multiple linear regression analyses to know the effect of the independent variable on the

dependent variable Microsoft Dynamics NAV ERP implementation system in the project chartering phase. As indicated from the above table, the Pearson correlation coefficient showed a result of 0.431 at a significance level of 0.001, so it is statistically relevant at  $p < 0.05$  and therefore the hypothesis is accepted. However, the multiple linear regression analysis results show that among the predictors' factors legacy system consideration has a relatively lower predicted value with 7.1 % and the P-value is greater than 0.05. There is no statistically significant link in the project chartering stage between the progress of an ERP implementation and legacy system consideration.

This finding is consistent with the outcomes of studies carried out by other researchers (Loh & Koh, 2004; Parr & Shanks, 2000). In the ERP implementation, current legacy systems need attention. It is important that an organization approaches the transition of a legacy system carefully and develops a comprehensive plan. During the project chartering phase in the ERP implementation projects, existing legacy systems must be carefully reviewed, defined, and tested to prepare for problems and interferences that may arise during implementation. However, legacy system consideration is not critical success factors when implementing a Microsoft Dynamics NAV ERP system in the project chartering phase.

#### **4.6. Chapter Summary**

This chapter presented the results of the statistical analysis that have been conducted on quantitative data. The correlation statistics analysis shows that there was a statistically significant relationship between top management support and involvement, ERP team and composition, and change management with the implementation of Microsoft Dynamics NAV ERP system success in the chartering phase. The multiple linear regression analysis also shows the same result. This means the independent variable top management support and involvement, ERP team and composition, and change management have a higher impact on the implementation of Microsoft Dynamics NAV ERP system success in the chartering phase.

# CHAPTER FIVE

## 5. SUMMARY, CONCLUSION, AND RECOMMENDATION

### 5.1. Summary of findings

Based on the correlation analysis, the statistical results show that all the identified and analyzed critical success factors have an association with Microsoft NAV ERP system implementation success in the project chartering phase. The critical success factors are summarized as follows:

The first hypostasis was to measure if project management is a factor in the success of the Microsoft NAV ERP system in the project chartering phase. The result showed that the Pearson correlation coefficient is 0.298 and the P-value is 0.02. This implies that; project management has a significant association with Microsoft Dynamics NAV ERP system implementation success in the project chartering phase.

The second hypothesis was used to determine the effect of project champion on the success of the Microsoft Dynamics NAV ERP system in the project chartering phase. The result showed that the Pearson correlation coefficient is 0.409 and the P-value is 0.001. This implies that project champion is a critical success factor in the success of the Microsoft Dynamics NAV ERP system in the project chartering phase.

The third hypothesis was required to examine the effect of Top management support on the success of the Microsoft NAV ERP system in the project chartering phase. The results showed that there was a significant association between the top management and Microsoft NAV ERP system implementation success in the project chartering phase with an estimated Pearson coefficient of 0.454 and the P-value is 0.001.

The fourth hypothesis was used to determine whether the ERP team and composition are a factor in the success of the Microsoft Dynamics NAV ERP system in the project chartering phase. The outcome from the analysis shows that the ERP team and composition is a critical success factor in the success of the Microsoft NAV ERP system in the project chartering phase with an estimated Pearson coefficient of 0.597 and the P-value is 0.001.

The fifth hypothesis was used to determine the effect of the business plan and vision on the success of the Microsoft Dynamics NAV ERP system in the project chartering phase. The result showed that the Pearson correlation coefficient is 0.323 and the P-value is 0.001 which implies that business plan and vision is a critical success factor in the success of the Microsoft NAV ERP system in the project chartering phase.

The sixth hypothesis was used to examine the effect of effective communication on the success of the Microsoft Dynamics NAV ERP system in the project chartering phase. The results showed that there was a significant association between the effective communication and Microsoft NAV ERP system implementation success in the project chartering phase with an estimated Pearson coefficient of 0.442 and the P-value is 0.001.

The seventh hypothesis was used to determine whether legacy system consideration is a factor in the success of the Microsoft NAV ERP system in the project chartering phase. The outcome from the analysis shows that legacy system consideration is a critical success factor in the success of the Microsoft NAV ERP system in the project chartering phase with an estimated Pearson coefficient of 0.431 and the P-value is 0.001.

The last hypothesis was used to determine whether change management is a factor in the success of the Microsoft NAV ERP system in the project chartering phase. The result of the tested hypothesis showed that change management has significant association Microsoft NAV ERP system implementation success in the project chartering phase with an estimated Pearson coefficient of 0.534 and the P-value is 0.001.

Based on the multiple regression analysis, the statistical results show that:

- ☞ ERP team and composition are considered the main predictor of the NAV ERP success with 39.2% predicted value, which means 1% changes on the ERP team and composition; NAV ERP implementation success will increase by 39.2% and ranked first.
- ☞ Change management and top management have an impact with 22.3%, and 13.2% respectively has a relatively moderate predictor of the NAV ERP implementation success.
- ☞ However, the remaining factors project champion, legacy system consideration, business plan and vision, effective communication and project management has relatively low predicted value with 7.7%, 7.1%, 5.0%, 2.0%, and -0.65 respectively. The value of

unstandardized coefficient B for Project management is -0.65. This shows that a 1% increase in the, there is a decrease in NAV ERP implementation success by 6.5%.

Therefore, the predictors (Change Management, and ERP team and composition,) have an impact on Microsoft Dynamics NAV ERP implementation success in the project chartering phase in selected case companies (Asku plc, MOHA soft drink, and Alle bejimla).

## **5.2. Conclusion**

As stated in the introduction and as seen by the problem statement and literature review, a couple of vital work done on ERP implementations relevant to the implementation stage in Ethiopia. The principal objective addressed within this study was identifying critical success factors in the implementation of the Microsoft Dynamics NAV ERP system in the project chartering phase in the case of selected Ethiopian companies (Asku plc, MOHA Soft drink, Alle Bejimla). The findings of this study could meet the research objectives addressed in chapter one. So, to meet the research objectives quantitative research method was implemented. The study has conducted a detailed, survey questionnaire, and documents review and finally identified eight critical success factors for the success of ERP implementation in the project chartering phase.

Data analysis was done by using statistical analysis techniques: Pearson correlation coefficient analysis and multiple linear regression analysis. Based on the Pearson correlation coefficient analysis result, all the independent variables have a significant association with the success of Microsoft NAV ERP system implementation in the project chartering phase. This means change management, project management, business plan and vision, effective communication, top management, ERP team and composition, project champion, and legacy system consideration are critical success factors in the success of Microsoft Dynamics NAV ERP system implementation in the project chartering phase.

According to the multiple linear regression analysis results, the independent variables (change management, project management, business plan and vision, effective communication, top management, ERP team and composition, project champion, legacy system consideration) have an impact on Microsoft Dynamics NAV ERP implementation success in the project chartering phase in selected case companies (Asku plc, MOHA soft drink, and Alle bejimla).

ERP team and composition are considered the main predictor of the success of Microsoft NAV ERP system implementation in the project chartering phase with a high predicted value. Whereas, change management and top management support have a relatively moderate predictor for Microsoft Dynamics NAV ERP implementation success in the project chartering phase

This study resulted in important theoretical contributions. First, this study contributed to academic research by providing empirical evidence to support critical success factor theories and successful implementation of Microsoft Dynamics NAV ERP during the chartering stage. This research confirmed that these managerial-related factors (change management), and people-related factors (ERP team and composition) are a critical success factor for successful Microsoft Dynamics NAV ERP implementation in the chartering phase. Second, these findings are also important if the context of this research is taken into consideration. This research will thus add to the growing body of knowledge on ERP implementations in Ethiopia.

Third, this study developed a research model that could be applied and shared by other organizations in Ethiopia with similar contexts and environments for Microsoft Dynamics NAV ERP implementation.

### **5.3. Recommendation**

As explained in this research, ERP systems are essential and provide organizations with competitive advantages. The demand for ERP is also coming to many Ethiopian organizations. So, the researcher suggests, and the key points below.

- ☞ The critical success factors found in this study should be by case companies as inputs to boost project implementation performance when implementing the next step of the Microsoft Dynamics NAV ERP system.
- ☞ Other Ethiopian companies planning to implement the Microsoft Dynamics NAV ERP system may consider implementing all the critical success factors listed in this study as inputs to manage their ERP system.
- ☞ The researcher recommends that organizations give high emphasis for ERP team and composition as this factor has high predictor value. Organizations should have a professionally, socially, and personally competent project team.

- ☞ Change management should be given due consideration by organizations. Enterprise-wide change in culture and structure that involves a change in people, organization, and community should be handled.
- ☞ Companies should give due attention to the Top Management Support. The organization's top management should reinforce support for the project from the very beginning and should educate and inspire the company's employees in the project chartering phases of implementation of Microsoft Dynamics NAV ERP systems.

#### **5.4. Limitation and Further Research**

These research results will add to the current literature on factors influencing the implementation of ERP systems in case companies. The research has some limitations, however. The first is the sample size which this study considers. The sample size is small, but taking more could provide a deep understanding of the system concepts. Having analyzed the sample size available with the survey questions, this research is still valid. Further studies may overcome these issues by selecting a larger sample size and a unique sampling approach. Second, the study focused only on those companies which implement Microsoft Dynamics NAV ERP system for their activities and the geographical boundary is limited. Further research could focus on more firms from various industries.

Some employees were not volunteering to fill the questionnaire because they are busy with their daily routine. Some of them seem bored with feeling lots of questionnaires from different researchers every year. So, the results are influenced because of not entirely taking part in the targeted survey respondents.

Finally, the limitation of this study is that it only represents the perspective of the Microsoft Dynamics NAV ERP system and this study cannot encompass all key critical success factors on ERP systems.

This study focused on the project chartering phase, further research could study other ERP implementation phases or by including all phases. Also, Each ERP critical success factor can be a research topic for further research.

## References

- Abdi, J. (2017). *Assessment of ERP Project Benefits and Barriers in Post Implementation Stage: The Case of Ethio Telecom Case Study (Master Thesis, School of information science, Addis Ababa University, Ethiopia)*. Retrieved from <http://etd.aau.edu.et/handle/123456789/310>.
- Addo-Tenkorang, R., & Helo, P. (2011). *Enterprise Resource Planning: A Review Literature Report. Proceedings of the World Congress on Engineering and Computer Science, II, October 19-21, San Francisco, USA*.
- Ahmed, F. N. (2003). *Implementation of ERP System in SMEs (Master thesis)*. Cranfield university school of applied sciences.
- Aladwan, A. M. (2001 ). *Change management strategies for successful ERP implementation. Business Process Management Journal, 7 (3), 266-275*.
- Ali, H., & Hasan, M. (2010). *Deployment of ERP system at Automotive Industries, Security Inspection. Global security, safety, and Sustainability: 6th International Conference (pp. 160-169)*. Beaga: Springer-Verlag Berlin Heidelberg.
- Aliyu, U. S., & Tariro, M. (2018). *The review of critical success factors of enterprise resource planning system implementation. Discovery, 484-495*.
- Asku plc. (2020, April 20). Retrieved from Asku plc: <http://www.ab-ig.com/asku/>.
- Benbasat, B. I. (1987). *The Case Research Strategy in Studies of Information Systems Case Research: Definition. MIS Quarterly 11(3), 369-386*.
- Bhagwani, A. (2009). *Critical Success Factors In Implementing SAP ERP Software. An Engineering Management Field Project report: Fall Semester, University of Kansas*. Retrieved from <http://hdl.handle.net/1808/5910>.
- Caralli, Richard., Stevens, James., Willke, Bradford., & Wilson, William. (2004). *The Critical Success Factor Method: Establishing a Foundation for Enterprise Security Management (CMU/SEI-2004-TR-010)*. Retrieved April 15, 2018, from the Software Engineering Institute, Carnegie Mellon University website: <http://resources.sei.cmu.edu/library/asset-view.cfm?AssetID=7129>.
- Christian, L. (2016). *Critical Success Factors for ERP Projects in Small and Medium-Sized Enterprises—The Perspective of Selected ERP System Vendors. Journal of Information System*.
- Coldwell, D., & Herbst, F. (2004). *Business Research*. Cape Town, South Africa: Juta and Co. Ltd
- Daniel, E. (2006). *Knowledge Management in Enterprise Resource Planning Systems. The O’Leary University of Southern California*.
- Derese, A. (2013). *Ensuring Successful Implementation of Enterprise Resource Planning (ERP): The Case of Ethio-Telecom (Master Thesis, School of information science, Addis Ababa University, Ethiopia)*. Retrieved from <http://etd.aau.edu.et/handle/123456789/12237>.

- Elisabeth J. U., Ronald, H. R., & Micheal, M. U. (2003). *Enterprise resource planning: Implementation procedures and critical success factors*. *European Journal of Operational Research*, 68(2), 241-257.
- Embong, B. (2008). *The Effectiveness of ERP Implementation in Manufacturing Industries (Master Thesis)*.
- Epicor. (2020, April 4). Retrieved from Epicor: <https://www.epicor.com/en-us/resource-center/articles/cloud-erp-software/>.
- Esteves, J. M., & Pastor, J. A. (1999). *An ERP Life-cycle-based Research Agenda*. *First International Workshop in Enterprise Management Resource and Planning*, 3 (1), 23-29.
- Finney, S., & Corbett, M. (2007). *ERP implementation: a compilation and analysis of critical success factors*. *Business Process Management Journal*, 8(2), 329-347.
- Fortune. (2020, April 16). Retrieved from Addis fortune: <https://addisfortune.net/columns/alle-bejimla-a-game-changer/>.
- Foziya, A. (2017). *Factors Affecting the Implementation of Enterprise Resource planning at Commercial Bank of Ethiopia (Master Thesis, School of information science, Addis Ababa University, Ethiopia)*. Retrieved from <http://etd.aau.edu.et/handle/123456789/15919>.
- Greengard, S. (2003). *Companies face steep costs and hard realities in the software wars*. *Workforce Management*, 82(9), 66-70.
- Julie, D., & Jonathan, O. (2008). *Critical Success factors in the Chartering Phase: a Case Study of an ERP Implementation*. *International Journal of Enterprise Information Systems*, 4(3), 9-24.
- Kibework, A. (2015). *The Challenges and Current Status of ERP Implementation: The case of Muger and Derba Cement Industries (Master Thesis, School of information science, Addis Ababa University, Ethiopia)*. Retrieved from <http://etd.aau.edu.et/handle/123456789/11237>.
- Langenwalter, G. (2000). *Enterprise Resources Planning and Beyond: Integrating Your Entire Organization*. St. Lucie Press, Boca Raton.
- Loh, T., & Koh, S. (2004). *Critical elements for a successful enterprise resource planning implementation in small and medium-sized enterprises*. *International Journal of Production Research*, 42(17), 3433-3455.
- Markus, M., & Tanis, c. (2000). *The enterprise systems Experience- from adoption to success*. In R Zmud (Ed.) *Framing of the domains of IT Research: Glimpsing the Future Through the Past*, Cincinnati, Pinnaflex Educational Resources, 173-207.
- Microsoft. (2012). *Introduction in Microsoft Dynamics NAV 2013*. Microsoft, unpublished
- Mitchell, V. (1996). *Assessing the reliability and validity of questionnaires: an empirical example*. *Journal of Applied Management Studies*, 199-207.
- Moha soft drink sc. (2020, April 19). Retrieved from MIDROC Ethiopia plc: [https://www.midroc-ethiopia.com.et/md\\_09moha.html](https://www.midroc-ethiopia.com.et/md_09moha.html).

- Mohamed, I. M., Loubna, B., & Abdelaziz, B. (2019). *Success Factors for ERP Implementation: a Systematic*. Proceedings of the International Conference on Industrial Engineering and Operations Management (pp. 5-7). Bangkok, Thailand: IEOM Society International.
- Nah, F.H., Lee-Shang Lau, J., & Jinghua, K. (2001). *Critical factors for successful implementation of enterprise systems*. *Business Process Management Journal*, 7 (3), 285-296.
- NAVaneethakrishnan, C. (2013). *A Comparative Study of Cloud based ERP systems with Traditional ERP and Analysis of Cloud ERP implementations*. *International Journal Of Engineering And Computer Science*, 2866-2869.
- Ozorhon, B., & Cinar, E. (2015). *Critical success factors of enterprise resource planning implementation in construction: Case of Turkey*. *Journal of Management in Engineering*, 31:4015014.
- Parr, A., & Shanks, G. (2000). *A model ERP project implementation*. *Journal of Information Technology*, 3(4), 289-303.
- Rahel, T. (2018). *Developing Erp Pre-Implementation Readiness Assessment Framework for Ethiopian Context: A Multi Stakeholders' Perspective (Master Thesis, School of information science, Addis Ababa University, Ethiopia)*. Retrieved From <http://etd.aau.edu.et/handle/123456789/19158>.
- Rashid, M. A. (2002). *The Evolution of ERP Systems: A Historical Perspective*. Idea Group Publishing, 1-16.
- Saron G. (2017). *Assesment Of Erp Implementation: The Case Of Heineken Breweries S.C Ethiopia (Master Thesis, College School of Graduate Studies, Department of MBA Accounting and Finance, St. Mary's University, Ethiopia)*. Retrieved from <http://repository.smuc.edu.et/bitstream/123456789/3181/1/>
- Saunders, M., Philip Lewis, & Adrian Thornhill. (2009). *Research methods for business students*. London: Pitman Publishing imprint.
- Sayegh, R. (2010). *Factors affecting the implementation of ERP systems in organizations in the U.A.E (Master Thesis)*. British University, Dubai.
- Shang, S., & Seddon, P. (2000). *A Comprehensive Framework for classifying the benefits of ERP systems*. *Americans Conference on Information Systems (pp. 1005-1014)*. Long Beach: Americans Conference on Information Systems.
- Sharma, P. (2004). *Enterprise Resource Planning*. New Delhi: S.B Nangia.
- Sintayehu, D. (2014). *Success Factors for Implementation of Enterprise Resource Planning System at Ethiopian Airlines (Master Thesis, School of information science, Addis Ababa University)*. Retrieved from <http://localhost:80/xmlui/handle/123456789/14744>
- Sisay, M. (2018). *Comparative Analysis of Critical Factors Affecting Erp Implementation in Private and Public Organizations in Ethiopia: a Pareto Approach (Master Thesis, School of information science, Addis Ababa University, Ethiopia)*. Retrieved from <http://etd.aau.edu.et/handle/123456789/20148>.

- StatisticsSolutions*. (2020, May 4). Retrieved from StatisticsSolutions:  
<https://www.statisticssolutions.com/assumptions-of-multiple-linear-regression/>
- Panorama Consulting Group LLC (2016). ERP report: A Panorama Consulting Solutions research report.*
- Panorama Consulting Group LLC (2014). ERP report: A Panorama Consulting Solutions research report.*
- Talluri, K. S., & Vasu, D. R. (2019). Evaluating Critical Success Factors of ERP. International Journal of Recent Technology and Engineering , 2277-3878.*
- Tasevska, F. (2013). Project Planning Practices Based on ERP Projects in SMEs- A Case study of R.Macedonia (Master Thesis). Faculty of Economics, University of Ljubljana.*
- Zewdu, A. (2016). Developing a framework for Evaluation of ERP Pre-Implementation Readiness: The Case of Dashen Bank Share Company(Master Thesis, School of information science, Addis Ababa University, Ethiopia). Retrieved from <http://etd.aau.edu.et/handle/123456789/14117>.*

## Appendix

Appendix-A: Questionnaire

**ADDIS ABABA UNIVERSITY**  
**College of Natural Science**  
**School of Information Science**  
**Department of Information System**

Dear Respondents

My name is Derbew Felasman and I am a post-graduate student of Information System at Addis Ababa University School of Information Science. I am conducting research on **Identifying Important Critical Success Factors in the project chartering phase of Microsoft Dynamics NAV ERP system implementation** in Ethiopian context.

The primary purpose of this questionnaire is to gather information about the important critical success factor in the project chartering phase of Microsoft Dynamics NAV ERP system in your organization in Addis Ababa. The collected data will be used for academic purpose only. All information provide by respondents will be treated with utmost confidentiality.

Therefore, your genuine response to the questions is vital for the quality and successful completion of the study. The accuracy of the information you provide highly determine the reliability of the study.

Contact Address:

Derbew Felasman

Tele - +251 928441011

E-mail–derbew12@gmail.com

Thank you in advance for your unreserved cooperation

**Part I: Demographical Information - Please put 'X' in the box**

**1.1. Gender**

Male

Female

**1.2. Age Group:**

≤ 25

26—35

36—40

41 and above

**1.3. Educational Status:**

Below Diploma

Diploma

BA/BSC

Masters & Above

Other please specify \_\_\_\_\_

**1.4. Your service year:**

≤ 3

4 – 10

11 – 15

16 – 20

21 and above

**1.5. The position you hold in the organization**

Project manager

Team Leader

Super User

Project Member

IT staff

Business Process Staff

Other \_\_\_\_\_

**Part II: Issues Related with the study area**

2. Please rate the following critical success factors in terms of importance when implementing Microsoft Dynamics NAV ERP system in the project chartering phase at your organization. Please read each statement carefully and show the extent of your agreement on the statements by circling the numbers in the column using the following rating scale (Likert Scale). 1 = Strongly Agree 2 = Agree 3 = Undecided 4 = Disagree 5 = Strongly disagree.

No.	Measures and Constructs	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree
<b>1.</b>	<b>Project Champion</b>					
1.1	Existence of project champion	1	2	3	4	5
1.2	High level executive sponsor as champion	1	2	3	4	5
1.3	Project sponsor commitment	1	2	3	4	5
<b>2.</b>	<b>Project Management</b>					
2.1.	There was a formal project management plan.	1	2	3	4	5
2.2.	There was a formal project team.	1	2	3	4	5
2.3.	There were regular project status meetings.	1	2	3	4	5
2.4.	There was strict monitoring of implementation schedules and costs.	1	2	3	4	5
2.5.	Carefully defined the scope of the project.	1	2	3	4	5
<b>3.</b>	<b>Business plan and vision</b>					
3.1.	Our ERP system supports our business goals	1	2	3	4	5
3.2.	Our ERP system supports our business mission	1	2	3	4	5
3.3.	There was justification for investment in ERP system	1	2	3	4	5
<b>4.</b>	<b>Top Management</b>					
4.1.	Employees was happy with the changes that top management decides on ERP issues	1	2	3	4	5
4.2.	Top management was freely share information in our organization	1	2	3	4	5
4.3.	The top management provides adequate direction and motivation for the staffs	1	2	3	4	5
4.4.	The top management helps to provide all of the necessary resources.	1	2	3	4	5

<b>5.</b>	<b>ERP team and composition</b>					
5.1.	There were best people on team	1	2	3	4	5
5.2.	There was balanced or cross-functional team	1	2	3	4	5
5.3.	Had Partnership, trust, risk-sharing, and incentives	1	2	3	4	5
5.4.	Business and technical knowledge of team members and consultants	1	2	3	4	5
5.5.	There was empowered decisionmakers	1	2	3	4	5
<b>6.</b>	<b>Effective communication</b>					
6.1.	There was targeted and effective communication	1	2	3	4	5
6.2.	There was communication among stakeholders	1	2	3	4	5
6.3.	Expectations communicated at all level	1	2	3	4	5
6.4.	There was project progress communication	1	2	3	4	5
<b>7.</b>	<b>Legacy system consideration</b>					
7.1.	There was suitable Business setting	1	2	3	4	5
7.2.	There was suitable Legacy system	1	2	3	4	5
<b>8.</b>	<b>Change Management</b>					
8.1.	Recognizing the need for change	1	2	3	4	5
8.2.	Enterprise-wide culture and structure management	1	2	3	4	5
8.3.	There was suitable user education and training	1	2	3	4	5
8.4.	There was user support organization and involvement	1	2	3	4	5
8.5.	There was IT workforce re-skilling	1	2	3	4	5
8.6.	There was Commitment to change-perseverance and determination	1	2	3	4	5
<b>9</b>	<b>NAV ERP Implementation Success</b>					
9.1.	Implementation was completed on time	1	2	3	4	5
9.2.	Implementation was completed within budget	1	2	3	4	5
9.3.	Implementation was completed as expected	1	2	3	4	5
9.4.	Users are satisfied with the implemented system	1	2	3	4	5