THE EFFECT OF ERP SYSTEMS IN SUPPLY CHAIN MANAGEMENT: IMPLEMENTATION OF UNIT 4 ERP IN A RESEARCH INSTITUTE

BY
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DECLARATION

I, Betre'ab Solomon, declare that the project entitled **— THE EFFECT OF ERP SYSTEMS IN SUPPLY CHAIN MANAGEMENT: IMPLEMENTATION OF UNIT 4 ERP IN A RESEARCH INSTITUTE** is my original work under the guidance and suggestion of the research advisor. It is offered to partially fulfill the Degree of Master of Arts in project management. This project has not been submitted for any degree in Addis Ababa University or any other University and all sources of material used for the project have been duly acknowledged.

Name: Betre'ab Solomon Signature: _____ Date: June 2023

This research project has been submitted for examination with my appropriate approval as a university advisor.

Confirmed by

Name: _____ Signature: _____

Date: _____ Place: _____

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Acronyms

ASCM	American Society of Supply Chain Management
ERP	Enterprise Resource Planning
HR	Human Resources
IT	Information Technology
ILRI	International Livestock Research Institute
MRP	Manufacturing Resource Planning
SAP	Systems Applications and Products in data processing
SCM	Supply Chain Management
SMEs	Small- and Medium-sized Enterprises

Abstract

This research aims to examine the effects of implementing ERP in SCM at the International Livestock Research Institute (ILRI) in Ethiopia. The study addresses critical success factors for ERP implementation, challenges faced during implementation, the impact of user involvement and training, and methods to evaluate the effectiveness of the implementation process. The findings of this study will contribute to project management practices and provide insights into the benefits and challenges of ERP implementation in SCM. The research methodology for this study involves a mixed-methods approach, incorporating both quantitative and qualitative data collection techniques. Quantitative data was gathered through Likert scale questionnaires, while qualitative data was obtained through interviews with unit managers and implementers, as well as document analysis. The combination of these methods has provided a comprehensive understanding of the impact of ERP implementation in SCM at ILRI. The study's findings will be beneficial for project management practitioners and academics, enhancing their understanding of the success and failure factors in ERP implementation. Furthermore, the research will contribute to knowledge regarding the effects of successful ERP implementation on supply chain management in an Ethiopian context. The study also highlights the advantages of ERP, such as effective decision-making and improved supply chain management.

CHAPTER ONE

INTRODUCTION

1.1 Background

ERP is defined as the ability to deliver an integrated suite of business applications and ERP tools share a common process and data model, covering broad and deep operational end-to-end processes, such as those found in finance, HR, distribution, manufacturing, service, and the supply chain. ERP applications automate and support a range of administrative and operational business processes across multiple industries, including a line of business, customer-facing, administrative, and asset management aspects of an enterprise. (*Gartner, 2023*)

Usually called enterprise resource planning systems (ERP), these comprehensive, packaged software solutions seek to integrate the complete range of a business's processes and functions to present a holistic view of the business from a single information and IT architecture. Most large organizations worldwide have already adopted ERP, and increasingly small- and medium-sized enterprises (SMEs) are also finding it cost-effective and a competitive necessity to follow suit. Though the breadth and tight integration of ERP has only become available in recent years, ERP has a pedigree in large, packaged application software that has been in widespread use since the 1970s. (*Klaus H, Rosemann M, Guy G (2000*)

1.2Enterprise Resource Planning and Supply Chain Management

A brief definition of Supply Chain Management (SCM) is the design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand, and measuring performance globally. (*ASCM, 2023)*

To achieve SCM success, organizations are increasingly implementing Enterprise Resource ERP systems. Embedded within an organization’s SCM, ERP systems further enhance the efficiency of internal supply chain processes such as inventory control, delivery scheduling and transportation planning, thus increasing the supply chain's distribution productivity. (*Ho, 2007*)

Many studies define the main philosophy of SCM as to have the right product in the right place, at the right price, at the right time and in the right condition. Shatat and Udin (2012) suggest that to achieve these goals, organizations need an information system such as ERP system, to facilitate the synchronization of the entire supply chain and provide timely information to all supply chain partners to assist their decision making and eventually attain customer satisfaction.

ERP in the supply chain creates and executes a more efficient SCM process. The cross-departmental and multi-organizational nature of the supply chain makes it difficult for retailers to manage SCM effectively. However, an ERP system performs all the business functions such as human resources, finance, and accounting so you can easily access centralized information such as finance, logistics and distribution. As a result, ERP and SCM integration helps deliver products and services to customers with incredible speed, efficiency, and overall quality. (*Pham, 2022*)

1.3 Background of the Organization

The International Livestock Research Institute (ILRI) was established on 21 September 1994 as an international not-for-profit livestock research organization by an Establishing Agreement signed by the Governments of Kenya, Ethiopia, Denmark, Sweden, the Swiss Confederation, and the United Nations Environment Programme. Under the agreement, ILRAD (the International Laboratory for Research on Animal Diseases established in 1973 with headquarters in Nairobi) and ILCA (the International Livestock Center for Africa established in 1974 with headquarters in Addis Ababa) were unified to create ILRI.

ILRI, as a scientific research-centered organization to fulfill its strategic objectives, tries to adapt science-based activities to achieve better lives through livestock, persuade partners to make bigger livestock investments and increase capacity among ILRI's key stakeholders to make better use of livestock science.

The Supply Chain is one of the vital operations departments whose job is to enhance the value of ILRI's activities by purchasing products and services that are economical for ILRI, meet quality standards, and can be used promptly, including continuously, executing operations with extreme efficiency, effectively managing relationships with both internal and external parties, including preserving a stable supply base and

offering ILRI the best inventory and procurement practices according to all applicable rules and norms. Procurement and inventory management are considered one integrated function as their primary role is the same: Ensuring that goods correspond to the requesters. needs/requirements are provided in the most cost-effective, efficient, timely, and ethical manner in accordance with all policies and legal and donor-imposed regulations.

UNIT4 is Enterprise Resource Planning (ERP) software ideal for service or people-based organizations with financial accounting needs to be integrated into a single system's core business functions. These functions include accounting, budgeting, procurement, HR, payroll, project management, field asset management, and analytics, ensuring a functional breadth that promotes access to business information. (*UNIT4, 2023*).

Unit 4 ERP software solution encompasses a range of integrated, cutting-edge functionality, which has been designed to increase the day-to-day efficiencies of organizations. By having a single management system for all their business activities, organizations can achieve numerous benefits, notably:

- Increased efficiencies across the organization as different functions can access and share relevant information.
- An integrated view of how the work of different functions impacts the performance of other functions and the organization in general.
- Quicker and better strategic decision-making thanks to real-time and accurate information
- The streamlining and automation of low-value business process thanks to the cutting-edge functionality included.

Unit 4 ERP offers a fully integrated business application set by reducing or eliminating lower-value management tasks. Unit 4 ERP increases institutional effectiveness and promotes financial transparency. It is easy to implement and highly adaptable when a business needs change. It is also less expensive to maintain than traditional "production-focused" ERP systems.

Unit 4 ERP's architecture smartly couples three core areas to move in lockstep: Data model (information), process model (workflow), and delivery model (reporting & analytics). Any changes made in one area automatically flow into the other, without needing to re-do or re-check for accuracy. *(GCON4, 2023b)*

UNIT4 Agresso Key Features include Financial Management, Human Resources and Payroll, Planning, Budgeting and Forecasting, Procurement Management, Project Costing and Billing, ERP Reporting and Analytics, Business Process Automation, Field Service Management, and Automation. Unit 4 Procurement Management Supports, automates, and standardizes all stages of the indirect purchasing and procurement cycle. This includes everything from the initial identification of needs for a product through the payment settlement. The procurement management system is made for organizations that need to control costs while streamlining the procurement process. UNIT4 Procurement management includes automatic routing for approvals or modifications by supervisors. This includes requisitions, purchase orders, internal orders, order confirmations, and supplier invoices.

1.4 Statement of the Problem

ERP systems have a significant impact on businesses today by aligning separate departments and improving workflows, resulting in significant bottom-line savings. ERP systems provide transparency into your complete business process by tracking all aspects of production, logistics, and financials. (*What Is ERP?, n.d.*). ERP solutions increase efficiency across the organization since it touches every piece of the business. (*McCue, 2022*)

According to (Jenkins, 2023), organizations can manage their supply chain management (SCM) activities more effectively and efficiently with the use of enterprise resource planning (ERP) technologies. The author furthers illustrates that organizations can get a variety of advantages by integrating critical supply chain functions including demand planning, sourcing, production, and order administration using ERP. Among the most widespread advantages mentioned are, increased effectiveness, handling corporate data and optimizing procurement processes and increasing communication in the workplace.

One common problem in ERP implementation is the challenge of ensuring effective user adoption. This can be due to a variety of factors, such as inadequate training, poor system performance, or a lack of involvement from end-users in the implementation process. In addition, ERP systems often require significant changes to existing business processes, which can lead to resistance to change and low user adoption rates. This can impact the success of the implementation process, and other issues that can negatively impact the organization's operations and bottom line.

In the context of specifically implementing ERP in SCM, one challenge is integrating the ERP system with existing SCM processes. This can lead to data inconsistencies, inefficiencies, and delays in SCM operations. Additionally, SCM processes often involve complex supply chains and logistics, which can make it difficult to design and implement an ERP system that meets the specific needs of the organization. Further challenges include resistance to change, customization issues and data security concerns. ERP implementation can also be expensive, and if not properly managed, it can lead to cost overruns. This can happen if the project scope is not properly defined or if there are unexpected issues that arise during the implementation process.

Only a few investigations, to the researcher's knowledge, have been carried out on the effects of ERP in general. For instance, Sintayehu (2014) attempted to evaluate the success factors for the SAP ERP implementation at Ethiopian Airlines. Research on the Oracle ERP system at the government-owned enterprise Ethio-Telecom was done by Derese (2013). Research has been done to identify the shortcomings and strengths of the ERP project management system. For instance, Abiot and Jorge (2012) evaluated the deployment of MS-Dynamics ERP in Mesfin Industrial Engineering and discovered examples of projects that successfully implemented ERP.

ILRI has put in place an ERP system that has been customized to meet management demands as well as stakeholder expectations. While the ERP system presented opportunities for the organization, it also had its challenges. This study aims to explore those difficulties as well as the positive effects of the system on SCM's overall performance and service quality, management and customer satisfaction, and workflow efficiency. As far as the researcher is aware, there hasn't been any research on how ERP implementation on an SCM in a research institution in Ethiopia.

1.5 Research Questions

The following research questions are attempted to be answered in this project paper based on the problem definition and study objective.

1. What are the critical success factors for ERP implementation in Supply Chain Management?

2. What are the most significant challenges that organizations face during ERP implementation, and how can these be addressed?

3. What is the impact of user involvement and training on the success of ERP implementation and how can organizations ensure effective user adoption?
4. How can an organization evaluate the effectiveness of the ERP implementation process, and what metrics should be used to measure success?

These queries will be addressed considering the data and information gathered for this investigation.

1.6 Objectives of the study

1.6.1 General Objective

The general objective of this study is to examine the effect of implementation of an Enterprise Resource Planning (ERP) in Supply Chain Management (SCM) at ILRI.

1.7 Specific Objective

Having the general objectives, the specific objectives are:

- To evaluate the effectiveness of ERP in improving SCM performance.
- To analyze the challenges and benefits of implementing ERP in SCM.
- To investigate the challenges and recommend possible solutions for further improvement of the system.

1.8 Significance of the study

The study's findings will be beneficial for project management practitioners and academics in many ways because they will give them vital knowledge regarding the success and failure variables in implementing ERP. The study is theoretically anticipated to improve information regarding the effects of a successful ERP

implementation in supply chain management in an Ethiopian context. The findings of this study will also highlight the advantages of ERP on a bigger scale, such as effective corporate decision-making and supply chain management.

1.9 Scope of the Study

Although the ERP modules have been deployed to be used as well by the supply chain management, finance, liaison and human resource management, the scope of this research is bound to conducting a single-case study to investigate the impact of ERP system in the supply chain management in a research institute.

1.10 Organization of the Study

There were five chapters in the research. The study's background, problem statement, aims, significance, and scope and scope of the study were all addressed in the first chapter. The discussion in chapter two is centered on a review of the literature on significant ideas that are pertinent to the subject. The third chapter discusses the methodology used in the study, including the data source, sampling frame, and size, data gathering tool, and data analysis approach. The study's results are discussed in the fourth chapter. The Fifth Chapter gives the study's conclusion and recommendations considering its findings.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Overview

Based on the availability of prior scientific study, the theoretical context of ERP system was created in this chapter. Additionally, the literature on ERP installation in SCM was examined to analyze previous research and clearly demonstrate the research gap and support the need of this study. The researcher tried to recover a collection of publications with the intention of searching for literature to comprehend the theoretical foundations of ERP. Organizational backdrop, ERP Concepts, ERP Benefits, ERP Implementation, ERP Implementation in SCM, and ERP Implementation Challenges were some of the search terms and synonyms that were used to rationally direct the search engines. The parts that follow show various ideas linked to ERP research projects carried out elsewhere in the field of ERP.

2.2 Definition of ERP

The term "ERP" stands for "enterprise resource planning". The function of these software programs in most enterprises nowadays is not accurately portrayed by this name. The ERP system is more commonly thought of as an application with the primary goal of integrating information and business processes throughout various areas and departments in an organization rather than as a tool for resource planning. An ERP system comprises a database with a collection of pre-built apps that collaborate to support fundamental business activities within an organization. The ERP system is typically regarded as the foundation of an organization's business software portfolio and frequently collaborates with other business applications to support users and other actors. The ERP system and associated software form a complete solution to serve the stakeholders of an enterprise. *(Sagegg & Alfnes, 2020)*

ERP systems offer an integrated set of IT tools that assist business operations and are not just confined to planning tasks, despite what the acronym suggests. All essential business functions, such as financial management, human resource management, and operations, are supported by ERP systems. In addition, Business intelligence (BI), business analytics (BA), data warehousing, data mining, online analytical processing (OLAP), product lifecycle management (PLM), advanced planning and scheduling

(APS), customer relationship management (CRM), supply chain management (SCM), geographic information system (GIS), etc. are examples of "bolt-on" products that ERP vendors are increasingly offering. *(Leon, 2014)*

2.1 Brief History of ERP

MRP became the cornerstone of production management and control in the industrial sector in the middle of the 1970s. BOM, which is purchase order management that makes use of parts list management and components creation, was the norm at this point. And as this idea developed, it moved from order inventory control of materials to plant, people, and distribution planning, which later became MRP-II. Incorporating financial accounting, human resource management, distribution management, and management accounting tasks, this gradually took on the name ERP and expanded to cover all facets of enterprise core business.

Material Requirements Planning (MRP)

An MRP is a more advanced form of BOM processing. MRP first appeared in the 1960s and rose to prominence in the 1970s. The personnel in charge of manufacturing and production planning were looking for more effective and better ways to place orders for materials and components. For their purposes, they discovered that MRP was the ideal solution.

Closed-Loop MRP

Due to the large number of MRP supporters who yearned for more, the evolution of MRP into something greater than just an improved ordering method happened quickly. These MRP proponents understood that MRP could do more than just create material reordering schedules. When an item did not arrive by the due date, the MRP system could be utilized to track it down and send out an alert. This newly developed skill assisted in lowering the uncertainty inherent in every production process. Closed-loop MRP has several features for automating the production process in addition to planning for material requirements. It supports both planning and execution and includes tools and approaches to address both priority and capacity. It includes clauses for receiving feedback from the execution functions back to the planning

function, allowing the plans to be updated and amended in response to actual execution or adjustments in priorities.

Manufacturing Resource Planning (MRP II)

MRP II is the name of the third stage in the development of ERP. It is the logical progression from closed loop MRP and includes the following extra capabilities: financial interface, simulation capabilities (for better decision-making), and sales and operational planning.

As a result, MRP II is a methodology used for efficient resource planning within a manufacturing organization. Planning for business, sales and operations, production, material requirements, and capacity requirement; master scheduling; demand management; and the execution support systems for capacity and material are just a few of the interconnected components that make up MRP II. Financial reports including the business plan, purchase commitment report, shipping budget, inventory estimates, and others are integrated with the output from these systems.

Enterprise Resource Planning (ERP)

ERP's introduction represents the evolution's last stage. Like MRP II, ERP operates on the same principles. ERP is now a set of business processes with a wider scope, greater capacity to handle more business tasks, and better and more tightly integrated relationship with the finance and accounting operations thanks to enterprise software. The ERP system can also integrate with additional tools, like those for supply chain management, customer relationship management, and so forth, supporting enterprises outside of the confines of a single organization.

ERP forecasts and balances supply and demand. It is an all-encompassing set of planning, forecasting, and scheduling tools that unites clients and suppliers into a seamless supply chain, uses tried-and-true decision-making techniques, and coordinates sales, marketing, operations, logistics, purchasing, finance, product development, and human resources. It lays the groundwork for efficient supply chain management and e-commerce, with aims that include high levels of customer service, productivity, cost reduction, and inventory turnover. It achieves this by creating plans

and timetables that ensure the proper resources—labor, supplies, equipment, and cash—are accessible in the correct quantities at the right times.

ERP has all MRP II's features because it is an immediate development and extension of MRP. ERP is more effective because it applies a single set of resource planning tools throughout the entire organization, offers real-time integration of sales, operations, and financial data, and links resource planning techniques to the extended supply chain of customers and suppliers.

ERP implementation's main goal is to help businesses operate profitably and successfully in today's fiercely competitive and rapidly evolving marketplace. High levels of customer service, increased productivity, cost savings, higher inventory turnover (just-in-time inventory), etc. are among the objectives of ERP. As we have seen, MRP II has evolved into ERP. ERP has evolved beyond coordinating manufacturing processes to integrating backend operations across the entire organization from a business standpoint. ERP has advanced technologically from a rigid tiered client-server architecture to a more flexible legacy deployment.

2.2 Supply Chain Management

The term Supply Chain Management was coined to capture these linkages from the customer's customer to the supplier's supplier. APICS defines Supply Chain Management as the "planning, organizing, and controlling of supply chain activities." In 1996, the Supply Chain Council (SCC) was organized by Pittiglio, Rabin, Todd & McGrath (PRTM) and Advanced Manufacturing Research (AMR). Other definitions define supply chain management as the systemic, strategic coordination of the traditional business functions withing a particular company and across business within the supply chain, for the purposes of improving the long-term performance for the individual companies and the supply chain.

At the initiative of the consulting company Pittiglio Rabin Todd and McGrath (PRTM), the Supply Chain Council (SCC) was founded in 1996, with the aim of advancing supply chain management through the institution of standards. The Supply Chain Council is a nonprofit organization, which currently claims around 1,000 members worldwide, including well-known companies such as Siemens, Daimler,

Nokia, IBM, Intel, Coca Cola, BASF, Hewlett Packard, Unilever, UPS, and Toshiba (http://www.supply-chain.org).

The Supply Chain Council provides a reference model including modeling techniques, the so-called SCOR model (supply chain operations reference model). This model can be used on different planning levels, to describe intercompany business processes. The SCOR model is a process reference model, which means that it serves as a uniform reference for subjects and terms related with SCM processes.

The Supply Chain Council defines a process reference model as a model that integrates familiar concepts of business process reengineering, benchmarking, and measuring process efficiency in a cross functional framework. It consists of:

- Standardized descriptions of processes and subprocesses
- A framework for the relationships between subprocesses
- Standardized metrics for measuring process performance
- Best practices for improving performance
- Training and skills requirements aligned with processes, best practices, and metrics

2.3 Advantages of ERP

The installation of an ERP system provides numerous benefits, both immediate and long-term. The immediate benefits include increased productivity, information integration for better decision-making, quicker customer query responses, etc. Improved consumer satisfaction, a stronger corporate image, and other outcomes are examples of indirect advantages. Some of the direct advantages of an ERP system include the following: Business integration, flexibility, enhanced capacity for analysis and planning, and use of cutting-edge technologies.

Laudon, K. C., & Laudon, J. P. (2018). highlights several advantages of ERP systems, including improved business processes, increased productivity and efficiency, better data management, improved decision-making capabilities, and enhanced collaboration and communication. Similarly, Al-Mashari, M. A., & Zairi, M. (2000). identifies

several advantages of ERP systems, including standardization of business processes, improved data quality, increased operational efficiency, better supply chain management, and improved decision-making capabilities. According to Davenport, T. H. (1998). Some benefits of ERP systems, include improved integration of business processes, increased visibility into organizational activities, improved customer service, and enhanced strategic planning capabilities.

Overall, authors agree that ERP systems can provide significant advantages for organizations, including better business process standardization and integration, increased efficiency and productivity, improved data management and quality, better decision-making capabilities, enhanced collaboration and communication, and improved supply chain management.

2.4 The Evolution of ERP and SCM

As described by Kurbel (2013), the origins of supply chain management (SCM) and enterprise resource planning (ERP) may be traced to the 1960s, when computers were initially employed to solve business problems. The large computer manufacturers would create application software in addition to the computer hardware to boost the sales of their hardware. Computer vendors provided material requirements planning (MRP) software, often known as MRP systems or MRP packages, to manufacturing organizations. When compared to other types of business software at the time, MRP systems were quite advanced. Most of this program just demonstrated straightforward processing logic, converting input data into output data. The planning issues and the data structures were far more intricate in MRP. Planning the material requirements that matched a certain production program was the foundation of MRP. The following were the key inquiries in MRP: Which materials should be used, in what amounts, and how can the material needs be met?

Even though MRP is about estimating the necessary material quantities, manufacturing dates are implicitly assumed. Only if the production capacities are precisely accessible at the times when they are needed will it be possible to produce the anticipated quantities of all materials within the allotted time frame. For instance, this calls for the availability of the appropriate machines in response to production order requests. It is quite improbable that capacities will be available when they are

required because machine loading and the scheduling of production orders are not considered when calculating material requirements.

The following steps in the evolution start with Closed-loop MRP Planning for capacity requirements and scheduling of production orders are clearly included in MRP and MRP II. Oliver Wight, the organization's creator, claims that MRP II stands for manufacturing resource planning (rather than material requirements planning), meaning that all relevant resources, not only materials, must be considered during planning. MRP II is a "... comprehensive market and resource-oriented planning of the sales, production, and stock levels, which begins at the executive level," according to Wight. The so-called MRP II systems, which are information systems, were widely used. An MRP II system became the primary information system for the majority of manufacturing businesses, supporting not only the planning and controlling of materials, capacities, and production orders but also other business functions like purchasing, cost estimation, sales, and data collection for production. However, the core concept of MRP II—to integrate all resources necessary for a company's success in the planning—was not actually put into practice. The success of the firm is influenced by many business sectors than only those that are directly related to manufacturing.

The next stage of development, enterprise resource planning (ERP), filled in this vacuum while also considering the reality that there are other industries besides manufacturing. For these industries to operate profitably, strong information systems are also required. ERP systems serve all key business processes across all industries and across a variety of business types. The former MRP II systems "disappeared" with the rise of ERP systems. Some of them underwent a simple name change (from MRP II to ERP), while others joined larger ERP systems. Nowadays, most businesses across all industries rely on an ERP system as their information system foundation.

The field of supply chain management (SCM) was born because of this shift in emphasis from internal process optimization to enhancing intercompany processes, both in theory and in practice. Supply chain management emphasizes cooperation among supply chain participants, including active information sharing and coordination of each party's individual plans for manufacturing, distribution, and purchase. Both ERP vendors and logistics-focused software firms built the

information systems that enable supply chain management (SCM systems). The former either created new SCM systems that work with existing ERP systems or expanded their ERP systems with new SCM capability. Software firms created specialized SCM systems and additionally supplied interfaces to widely used ERP systems. This is because SCM is essentially impossible without ERP.

Today's typical business makes use of numerous information systems. For them to cooperate, these systems frequently undergo integration. Information systems are used to represent and carry out all significant business processes. Companies are using their own systems less and less frequently. Instead, they use industry-standard software that has been enhanced and tailored to meet their demands. Standard software, often known as standard or application package, refers to a software system created with the intention of being utilized by numerous businesses. Enterprise resource planning, supply chain management, office work, database management, and other issues have standard software solutions in the industry.

2.5 Overview of ERP Implementation

Due to a few circumstances, implementing an ERP system in a business is a challenging task. First, thorough planning must be done before the execution. For instance, an ERP system is anticipated to support the business procedures of the company. Prior to being mapped into the ERP system, these processes must first be properly described to do so efficiently and in a way that takes the needs of the organization into account. Before the ERP system can be installed, it is also necessary to define all the organizational structures of the business in terms of the concepts that the system supports. Business procedures and regulations for the organization can then be represented within the ERP system.

Second, the system typically needs to be adjusted. Although ERP systems are considered standard software, this does not indicate that the "standard" can be used in the organization in its current form. Contrarily, given that every business has unique requirements, is actual. The software company that created and built the ERP system was unable to foresee and consider every requirement that might arise in the future. Because of this, it is common for the "standard" to need to be modified to fit the company in the issue.

In the implementation process, a variety of factors need to be considered. There is a significant risk of forgetting some aspect or not choosing the best possible solution for an issue. That is why both consulting firms and ERP system vendors recommend employing a proven implementation methodology, that is, a methodology that has been successfully applied in other ERP projects.

2.6 ERP Implementation stages

There are many authors and experts in the field of ERP implementation, and their models may vary slightly in the number and naming of stages. However, most of these models share similar stages, such as planning, analysis, design, development, testing, and deployment, which are considered the core stages of ERP implementation. Holland, C.P. and Light, B. (1999) proposed five stages for ERP implementation, which are Initiation, Adoption, Adaptation, Acceptance, Routinization. Holland and Light's model follows a linear sequence, starting with initiation and ending with routinization, with each stage building on the previous one. This model emphasizes the importance of user acceptance and routine use of the system, as well as ongoing maintenance and improvement.

Currently, the most used ERP implementation stages are like those proposed by Nah, S. and Delgado (2006), which include:

1. Planning: In this stage, the organization defines the goals and objectives of the ERP implementation project, assesses the resources needed, establishes timelines, and selects the appropriate ERP system.

2. Analysis: In this stage, the organization evaluates its current business processes and identifies the areas that need improvement. The organization maps out its existing processes and identifies gaps between the existing processes and the desired future state.

3. Design: In this stage, the organization designs the new processes and configurations needed to meet the goals of the ERP implementation. The organization determines how the new system will integrate with existing systems and outlines the testing plan.

4. Development: In this stage, the organization configures the ERP system to meet its specific needs. This includes data migration, customization, and integration with other systems.

5. Testing: In this stage, the organization tests the new ERP system to ensure that it works as intended. This includes testing the system for errors, bugs, and performance issues.

6. Deployment: In this stage, the organization rolls out the new ERP system to users. The organization provides training and support to users to ensure a smooth transition to the new system.

7. Post-implementation: This stage involves ongoing support and maintenance of the ERP system after it has been deployed. This includes identifying and addressing issues that arise, monitoring system performance, and implementing upgrades and enhancements as needed.

While there may be some variations in the naming or number of stages, the above stages are widely accepted as the core stages of ERP implementation.

2.7 ERP Implementation Risks

ERP implementation risks refer to the potential negative outcomes or failures that may occur during the process of implementing an enterprise resource planning (ERP) system. These risks can arise from a variety of factors, including inadequate planning, insufficient resources, poor communication, and resistance to change. ERP implementation risks can impact various aspects of the organization, such as the functionality of the system, data integrity, business operations, employee satisfaction, and financial performance. Effective risk management strategies, such as proactive planning, stakeholder engagement, and training and education, can help mitigate these risks and increase the chances of a successful ERP implementation.

Some of the ERP implementation risks identified by Al-Mashari and Zairi (2000) are: lack of top management support, insufficient project management and planning, ineffective communication, insufficient training and education and resistance to change.

Several authors have cited major ERP implementation challenges in supply chain management (SCM), including Sun et al. (2013) identified challenges related to data integration, standardization of business processes, and system compatibility. Saeed et al. (2013) cited issues related to organizational culture, employee resistance to change, and a lack of communication and collaboration among stakeholders. Karimi et al. (2001) highlighted challenges related to data accuracy and consistency, the complexity of supply chain networks, and the need for stakeholder involvement and support. Li and Lin (2006) identified challenges related to system customization, stakeholder engagement, and the alignment of the ERP system with SCM objectives. Gunasekaran et al. (2017) cited challenges related to system implementation, data management, stakeholder involvement, and performance evaluation.

These authors all recognized that implementing an ERP system in SCM is a complex process that requires careful planning, effective communication, and strong leadership. They emphasized the importance of addressing the challenges related to data integration, standardization of business processes, and stakeholder involvement to ensure the success of the implementation.

2.8 ERP Implementation and SCM

Manufacturing resource planning II (MRP II) and material needs planning (MRP) were older methods that focused on an individual company, particularly the planning and control within the organization. Enterprise resource planning (ERP) is a more recent method. Supply chain management (SCM), in contrast, examines networks (or chains) of businesses linked to one another via supplier-customer interactions.

Logistics has given way to supply chain management, which has a higher emphasis on managing chains that go across organizational boundaries as well as business functions and procedures. This indicates that supply chain management is concerned with the appropriate operation of the entire supply chain, including all partners, and is not just concerned with the efficient operations of a single organization.

Enterprise resource planning focuses solely on an organization's internal operations, whereas supply chain management also aims to take advantage of the potential for

optimization that exists between the organizations. It focuses on how well all participants in a supply chain, both inside and outside the organization, work together.

According to Sun et al. (2013), ERP systems provide an integrated platform for enterprises to manage their internal and external resources, and they have been widely implemented in supply chain management. However, the implementation of ERP systems in supply chain management is often challenging due to the complexity of supply chain networks, the diversity of stakeholders involved, and the need for close coordination among different functions and departments.

According to Awad and Nassar (2010), a successful organization must be able to manage the integration of its operations, technologies, business processes, departments, and personnel both within and across extended businesses. In any business organization, integration entails not only integrating ERP systems with legacy systems to guarantee effective and efficient communications between these systems, but also integrating ERP systems with SCM systems and connecting them to CRM systems to promote cooperation and collaboration throughout the entire value chain (Awad & Nassar, 2010). The traditional supply chain management processes have been improved to be integrated with various business processes to increase the overall value of the chain, reduce costs, improve the production process, and other goals because of the information and communication technologies' (ICT) rapid evolution.

2.9 Critical Success Factors for ERP Implementation

Critical success factors (CSFs) are the essential factors or conditions that are necessary for the success of a project, program, or organization. They are the key areas that must be focused on to achieve the desired results. CSFs are typically specific to a particular organization, project, or industry, and they may vary depending on the context and objectives of the initiative. Identifying and addressing CSFs can help ensure that a project or initiative is successful and that the desired outcomes are achieved.

Some of the critical success factors (CSFs) identified by Nah and Delgado (2006) for successful ERP implementation are, top management support and involvement, business process reengineering and change management, project management skills

and methodology, software vendor support and partnership, data accuracy and quality, training and education, communication and collaboration, user involvement and acceptance, project team composition and competency, system testing and quality assurance.

Holland and Light (1999) also mention similar critical success factors (CSFs) for ERP implementation including IT infrastructure and technical compatibility, effective project management and control, adequate training and education, vendor and consultant support, appropriate software customization and configuration and effective communication and collaboration.

The authors emphasized the importance of these CSFs for achieving a successful ERP implementation and noted that organizations must pay careful attention to each of these factors to ensure the desired outcomes. They also noted that the CSFs may vary depending on the context of the organization and the specifics of the ERP implementation project. These CSFs can help organizations to ensure the successful implementation of ERP systems, which can lead to improved business performance and competitiveness.

2.10 Related Works

Numerous studies and works of literature on ERP deployment have been published globally and from the perspectives of various nations. Even though there has been a lot of ERP research done globally, Ethiopia has some literature and research on the subject in various sectors including Ethiopian Airlines, Ethio-telecom, Banks and Private Sectors.

In a case study of Mesfin Industrial Engineering, Abiot and Gomez (2012) performed research on a successful ERP implementation. The study's primary goal was to analyze the installation of ERP system while taking important technical, business, and cultural factors into account. The final proposal was that more ERP deployments in various Ethiopian enterprises needed to be researched and reported on.

In a similar research topic, Derese (2013) evaluated the framework for a successful ERP installation at the government-owned enterprise Ethio-Telecom. The study's primary goal was to provide learnings from an ERP deployment project that was

successful. To address CSFs during the reimplementation, implementation, and post-implementation stages, the researcher created a framework. Finally, he suggested that additional research be done to find more contextual elements.

The success factors for the deployment of the Enterprise Resource Planning system at Ethiopian Airlines were also the subject of research by Sintayehu (2014). The study's goals included looking into CSFs and discussing lessons learned with other Ethiopian companies operating in comparable environments and contexts. Finally, the researcher determined 20 variables that could be crucial to Ethiopia's implementation of the ERP system. These include organizational preparation, project planning, support from senior management, project management and leadership, consultant skill, change management, and communication. To support the conclusions of success determinants, the researcher suggested doing additional single and multiple case studies of ERP installation in Ethiopian enterprises.

Last but not least, Foziya, A. (2017) did research on "Factors Affecting the Implementation of Enterprise Resource Planning At Commercial Bank of Ethiopia," and the results show that organizational, technological, and human or individual aspects influence ERP deployment within the business.

CHAPTER THREE

Research Methodology

3.1 Introduction

Research methodology refers to the systematic approach and techniques used by researchers to collect and analyze data to answer research questions or test hypotheses. It provides a framework for researchers to address their research questions or objectives effectively. Yin (2018) defines research methodology as "a strategy or plan for how the research will be conducted, providing the overall framework that guides the collection and analysis of data." It involves the selection of appropriate research design, data collection methods, and data analysis techniques. Creswell (2014) describes research methodology as "the procedures and techniques used to collect and analyze data needed to answer research questions." It encompasses the choice of research design, sampling techniques, data collection instruments, and data analysis methods.

The research methodology used for this study is covered in detail in this section. The research's methodology and design, demographic and sampling methods, data type and source, data collection and analysis methodologies, the reliability of the data acquired, and ethical issues are all addressed in turn. To back up the essential decisions taken, their importance to this study is thoroughly analyzed.

3.2 Research Design

3.2.1 Research Design

The broad framework or strategy that directs the researcher in carrying out a study and addressing research questions or objectives is referred to as the research design. It describes the techniques and methods that will be used to gather and analyze the data.

Research design, as defined by Creswell (2014), is "the set of methods and procedures used in collecting and analyzing measures of the variables specified in the research problem." It describes the whole process, including the decision on the research approach, the means for gathering data, and the procedures for data analysis. These approaches include qualitative, quantitative, and mixed methods, which reflect

different philosophical orientations and research paradigms. The method of approach (qualitative, quantitative, or mixed approaches) determines the methods chosen, the methods used for data collecting, and the methods used for data analysis. The research design approach is important for ensuring that the research study is in line with the research questions and objectives, for addressing underlying assumptions about the nature of reality, and for selecting the best methodologies for knowledge creation.

This research design incorporates both quantitative and qualitative data collection techniques to gain a comprehensive understanding of the research topic. The quantitative component involved administering Likert scale questionnaires to collect data from different groups. This component focuses on obtaining numerical data to assess participants' perceptions, attitudes, and satisfaction levels related to the impact of ERP. The qualitative component involves conducting interviews with unit managers and implementors and analyzing relevant documents. This component aims to gather rich qualitative data that provide in-depth insights into participants' experiences, challenges, successes, and perspectives regarding the impact of ERP. The interviews and document analysis help capture nuanced information that goes beyond numerical ratings.

3.3 Population, sampling, and sampling technique

3.3.1 Population

The population, according to Sekaran and Bougie (2016), is the total group of people, things, or events that fit certain requirements and are of interest to the researcher. It stands in for the bigger target audience from which the researcher wants to infer conclusions. The population would consist of all the people employed by that organization. The estimated population size used for this study where a total of 173 classified into four groups as summarized below.

Table 3.1 Target Population used as a sample size.

No	Target Populations	Number of populations
1	Top Management	20
2	Supply Chain Unit	12
3	ERP Users	170
4	ERP Implementors	3

3.3.2 Sampling technique

The sampling technique used for purpose of this study is a combination of purposive and convenience sampling. Purposive sampling was used to obtain in-depth information or specialized knowledge from a specific group of individuals who possess the desired characteristics or experiences in the implementation and usage of ERP. Convenience sampling was used to select participants based on their availability and willingness to participate in the study. All participants are employees of the organization or hosted staff in the organization and this sampling method is used to gather the required data quickly and efficiently.

3.4 Data Collection Methods

In this study, structured questionnaires using Likert scale questions on the effects of ERP on general users, managers, implementors and supply units was used. A typical five-level Likert scale of 1 to 5 was used to collect quantitative data on participants' perceptions, attitudes, and satisfaction levels. A set of 4 different types of questionnaires were designed and sent electronically to selected groups who were unit managers, implementors and users of the ERP system.

Moreover, individual interviews with ICT expert, managers and users were also conducted to provide an opportunity to explore participants' experiences, challenges, successes, and insights regarding the impact of ERP implementation. Documents including project plans, system documentation and other relevant documents were also collected and analyzed that provide insights into the goals, processes, challenges, and outcomes of the ERP implementation.

3.5 Reliability and Validity

3.5.1 Reliability

The reliability of the data collected in this study was assessed to ensure the consistency and stability of the measurements. Internal consistency reliability was examined for the Likert scale questionnaire items using Cronbach's alpha. A Cronbach's alpha value of 0.717 was obtained, indicating high internal consistency among the items.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.717	.770	12

3.5.2 Validity

To ensure the validity of the data, several measures were taken. A thorough literature review was used to ensure that the questionnaire items adequately covered the relevant aspects of the impact of ERP implementation on supply chain management. Furthermore, face validity was established by pre-testing the questionnaire with a pilot sample of participants like the target population. Feedback from the pilot study participants was collected and incorporated into refining the questionnaire, ensuring that the items were clear, understandable, and relevant to the participants.

It is important to note that while efforts were made to establish reliability and validity, there may be inherent limitations and potential sources of error in the data collected. These include potential response biases, sampling limitations, data errors and reliance on self-reported data. Despite these limitations, the steps taken to assess reliability and validity enhance the confidence in the findings of this study.

3.6 Ethical Consideration

The rules and regulations that researchers should follow to secure the protection, well-being, and rights of the participants as well as to preserve the objectivity of the study process are known as ethical considerations in research methodology. This research project adhered to ethical guidelines to ensure the protection of participants' rights, privacy, and confidentiality throughout the data collection and analysis process. The following ethical considerations were carefully addressed:

Informed consent: was obtained from all participants, including ERP users, managers, SCM staff, and implementors. Prior to their participation in the study, participants were provided with detailed information about the research purpose, procedures, potential risks and benefits, and their rights to voluntary participation. Participants were assured that their involvement was entirely voluntary, and they had the freedom to withdraw from the study at any time without penalty.

Data Collection and Privacy: The collection of participant data was conducted in accordance with applicable data protection laws and regulations. Participants' privacy was of utmost importance, and all data were handled confidentially and stored securely. Personal identifying information, such as names and contact details, was anonymized or pseudonymized during data collection to ensure participant confidentiality. Measures were taken to safeguard the privacy of participants during the research process.

In summary, this research project was conducted with a strong commitment to ethical principles and considerations. The rights, privacy, and confidentiality of all participants were protected, and the study was carried out in accordance with relevant ethical guidelines and regulations.

CHAPTER FOUR

Data Presentation, Analysis and Discussion

4.1 Introduction

This section presents the results of the data analysis conducted on the feedback collected from different groups of users working in various levels of the organization. The data were obtained through Likert scale questionnaires and interviews. The data was then analyzed using quantitative descriptive statistics with the help of IBM SPSS Statistics version 25 statistical computer software of Cronbach's Alpha test model. The analysis aimed to explore the perceptions, experiences, and outcomes associated with the impact and challenges of implementing ERP system.

4.2 Data Presentation

The total number of distributed questionnaires was 170 and the number of responses were 38.

The response rate is 22%. While this sample size may be considered relatively small, it provided some valuable insights and trends since the responses were diverse and representative of the target population. Alternatively, qualitative interviews were also conducted to further enhance the data analyses. Shih and Fan (2008) reported a 34% averaged response rate of online surveys.

(Office of Management and Budget, 2016) have concern about surveys with response rates lower than 80% is that the responses might not represent the intended survey population, which could introduce nonresponse bias and impact the data quality. Nonetheless, researchers found no evidence suggesting an 80% or higher response rate is an optimum response rate (Hendra & Hill, 2019). The National Survey of Student Engagement (NSSE), one of the most frequently used higher education assessment tools, was examined by Fosnacht et al. (2017) to generate alternative hypotheses. With a sample size of at least 500, they discovered that the estimations based on the data remained accurate even with a 5%–10% response rate. Additionally, they discovered that surveys with lower sample sizes—less than 500—need response rates of 20% to 25% to get estimates that are reasonably certain.

4.2.1 Demographic Data

Below is the summary of employees age, department they reside in and the number or years they have been using ERP in the organization.

Table 4.1 Age, Department and Usage Table

Groups		***Managers***	***Implementors***	***Supply Chain Unit***	***Users***	***Percent***
Age	18-25	0	0	0	0	0
	26-35	0	0	0	11	33.3%
	36-45	2	4	2	16	48.5%
	46-55	2	0	0	5	15.2%
	56 and above	0	0	0	1	3%
Department	Admin	1	0	0	4	12.1%
	Agroforestry	0	0	0	2	12.1%
	Finance	0	0	0	11	33.3%
	HR	0	0	0	2	6.1%
	Hospitality	1	0	0	4	12.1%
	ICT	1	2	0	4	12.1%
	M&E	1	0	0	0	3.0%
	SCM	0	0	2	0	6%
	Communication	1	0	0	0	3.0%
	Others	0	0	0	3	9%
ERP Usage	Less Than a year	0	0	0	1	2.9%
	1-3 Years	0	0	0	7	20.5%
	3-5 years	2	2	1	6	32.4%
	More than 5 Years	2	2	1	10	44.11%

Based on the data, it can be observed that the age group with the highest representation among respondents is 36-45 years, accounting for 48.5% of the total. On the other hand, the age group of 56 and above has the lowest representation at only 3%, while no respondents fell within the 18-25 age group. This suggests that the survey sample predominantly consists of individuals in their late thirties to mid-forties. The lack of any respondents in the 18-25 age group indicates that younger individuals may be underrepresented or not included in the survey.

The finance department comprises the largest proportion of respondents, making up 33.3%, while the departments of M and E and communications have the lowest representation at 3% each. All participants surveyed confirmed their use of ERP, except for a single individual. Most respondents (44.11%) reported using ERP for more than 5 years, indicating the highest duration of usage. Conversely, the lowest usage duration of less than a year was reported by 2.9% of respondents. This indicates a significant proportion of long-term users, suggesting familiarity and experience with the ERP system. On the other hand, a small percentage (2.9%) reported using ERP for less than a year, indicating a relatively new user base or recent implementation of ERP within the organization.

In summary, the analysis reveals a predominant age group, variations in departmental representation, widespread adoption of ERP with few exceptions, and a mix of long-term and relatively new users.

Table 4.2 Survey Response Data on Effects of ERP Implementation

Statement	***Strongly Agree***	***Agree***	***Neutral***	***Disagree***	***Strongly Disagree***	***Mean***	***Std.Deviation***
Improved Efficiency in performing daily tasks	12 (36.4%)	20 (60%)	0%	0%	0%	4.37	.492
Enhanced Data Access and Retrieval	23 (69.7%)	9 (27.3)	0%	0%	0%	4.28	.457
Streamlined Business process and workflow	13 (39.4%)	18 (54.5%)	0%	0%	0%	4.42	.502
Improved Data Accuracy and Reliability	7 (21.2%)	23 (69.7%)	0%	0%	0%	4.23	.430
Increased Collaboration and Communication	12 (36.4%)	19 (57.6%)	0%	0%	0%	4.39	.495
Increased Productivity	5 (15.2%)	24 (72.7%)	0%	1 (3%)	0%	4.10	.548
Facilitated better decision making	3 (9.1%)	26 (78.8%)	0%	1 (3%)	0%	4.03	.490
Statement	***Greatly Improved***	***Improved***	***Remained the same***	***Hindered***	***Greatly Hindered***	***Mean***	***Std.Deviation***
Improved Quality of Work Outcomes	8 (24.2%)	20 (60.6%)	1 (3%)			4.24	.511
Statement	***Very Effective***	***Effective***	***Moderately Effective***	***Ineffective***	***Very Ineffective***	***Mean***	***Std.Deviation***
Effectiveness of Training and Support	2 (6.1%)	13 (39.4%)	12 (36.4%)	2 (6.1%)		3.52	.738
Statement	***Very Satisfied***	***Satisfied***	***Neutral***	***Dissatisfied***	***Very Dissatisfied***	***Mean***	***Std.Deviation***
Satisfaction of using the system	13 (39.4%)	17 (51.5%)	1 (3%)	1 (3%)		4.31	.693

Based on the data summary above, I will summarize the three highest outcomes of the data. We can see that the highest mean value is 4.42 with a standard deviation of 0.502. The mean value of 4.42 indicates that, on average, the respondents' opinions or attitudes towards ERP streamlining business process and workflow tend to lean towards agreement. This suggests that, overall, the respondents have a positive perception of the effectiveness and efficiency of ERP in streamlining business processes and workflows.

Next with a mean value of 4.39, it suggests that, on average, the respondents tend to agree or strongly agree that ERP implementation has resulted in increased collaboration and communication within the organization. The standard deviation of 0.495 suggests a relatively low level of variability in responses. This indicates that most respondents share a similar perspective on the positive impact of ERP on collaboration and communication, as the responses cluster around the mean value. Overall, these findings suggest that the implementation of ERP systems has been perceived positively by the respondents in terms of improving collaboration and communication within the organization.

And finally, the respondents, on average, reported a high level of agreement (mean of 4.37) that implementing an ERP system increased efficiency in their day-to-day tasks. This indicates that many respondents expressed positive views regarding the impact of ERP on improving efficiency. The standard deviation of 0.492 suggests that there is relatively little variability in the responses. The responses are clustered closely around the mean, indicating a high level of agreement among the respondents regarding the positive impact of ERP on efficiency. Overall, this information suggests that, according to the respondents, implementing an ERP system has significantly increased efficiency in their day-to-day tasks.

The lowest mean value of 3.52 and standard deviation of 0.738 were found on responses to measure the effectiveness of user training and support during ERP implementation. This suggests that, on average, the respondents rated the effectiveness of user training and support during ERP implementation between "Neutral" and "Slightly Agree." It indicates a moderate level of agreement or positive perception regarding the effectiveness of training and support. The standard deviation of 0.738 indicates the variability or spread of the responses around the mean. In this

case, the relatively low standard deviation suggests that the responses tend to cluster relatively close to the mean. It implies that there is a degree of agreement among the respondents regarding the effectiveness of user training and support during ERP implementation. Overall, based on the provided mean and standard deviation, it appears that the respondents have a moderately positive perception of the effectiveness of user training and support during ERP implementation.

4.3 Challenges of ERP Implementation

Table 4.3 Survey Response Data on Challenges of ERP Implementation

Statement	***Mean***	***Std. Deviation***
Please rate the level of difficulty your organization faced in addressing the following challenges during the ERP implementation: Change management and employee engagement	4.50	.577
How challenging was it to ensure effective user adoption during the ERP implementation?	4.25	.500
Please rate the level of difficulty your organization faced in addressing the following challenges during the ERP implementation: System customization and configuration	4.25	.500
Please rate your level of agreement or disagreement with the following statement: "ERP implementation has positively impacted our organization's financial performance."	4.25	.816
Please rate the level of difficulty your organization faced in addressing the following challenges during the ERP implementation: Data migration and cleansing	4.25	.500
Please rate the level of difficulty your organization faced in addressing the following challenges during the ERP implementation: User training and education	4.00	.000
To what extent do you agree or disagree with the statement: "ERP implementation has reduced operational costs within our organization."	4.00	.816
To what extent did the following factors contribute to the	3.75	.500

challenges faced during the ERP implementation process? Lack of clear communication and coordination among stakeholders		
To what extent did the following factors contribute to the challenges faced during the ERP implementation process? Insufficient budget and resources allocated for implementation	3.50	1.291
To what extent did the following factors contribute to the challenges faced during the ERP implementation process? Inadequate project planning and management	3.25	.957
To what extent did the following factors contribute to the challenges faced during the ERP implementation process? Resistance to change from organizational culture	3.25	1.500

The provided table presents a summary of responses regarding the challenges encountered during the implementation of ERP. It is important to note that the sample size is relatively small compared to the total number of respondents or user groups surveyed. The data was collected specifically from ERP system implementors who were able to provide their input.

For example, based on a mean of 3.75 and a standard deviation of 0.500, it can be inferred that the lack of clear communication and coordination among stakeholders is considered a significant challenge during ERP implementation. Respondents generally perceive this factor as having a notable impact on the overall challenges faced.

Furthermore, the average mean value of 3.50 suggests that insufficient budget and resources are perceived as moderately impactful challenges during ERP implementation.

Additionally, with a mean value of 3.25 and a standard deviation of 0.957, respondents perceive inadequate project planning and management as a contributing challenge during the ERP implementation process.

The mean value of 3.25 indicates that, on average, respondents consider resistance to change from organizational culture as a moderate contributing factor to the challenges encountered during ERP implementation.

In summary, the analysis focuses on the lowest mean value and standard deviation, identifying inadequate project planning and management and resistance to change from organizational culture as the most significant challenges during and after the ERP implementation.

CHAPTER FIVE

FINDINGS, CONCLUSIONS AND RECOMMENDATION

5.1 Introduction

My personal interest in the topic, as well as my present position as an ICT Infrastructure officer, drove my research, which focused on 'The Effects of ERP Implementation in Supply Chain Management (SCM)' with the International Livestock Research Institute (ILRI) as a case organization. Being involved in the ICT infrastructure of ILRI, I have had the opportunity to use the ERP system myself and provide support whenever needed. This firsthand experience motivated me to delve deeper into the subject and explore the impact of ERP implementation on ILRI's supply chain management processes. In summary, this chapter serves as a comprehensive overview of my research findings, conclusions, and recommendations regarding the effects of ERP implementation in supply chain management at ILRI. The insights gained from this study provide a foundation for ILRI to make informed decisions and strategic adjustments to optimize the utilization and longevity of its ERP system, thereby enhancing its overall business flow and achieving its supply chain management objectives.

5.2 Findings

The findings of this study shed light on the critical factors that contribute to the success of ERP deployment in an organization like ILRI.

Some of the participants who were part of the study were ICT customer service technicians who have been using the ERP system for more than 4 years after the system's implementation. One of the biggest challenges post-implementations was the lack of frequent training of the system. Because of the nature of their job, they had to learn how to utilize the system without any formal training. This created a significant gap in aiding others during difficult times.

ICT technicians also had to rely on their own expertise and experience to try to fix issues when users faced faults or unexpected behavior. This was frequently time-consuming and frustrating, and it resulted in lengthier customer wait times. They were frequently requested to train other users on the ERP system. However, because they

lacked official training, they were limited in what they could teach others. This caused a lot of confusion and frustration among users, making it more difficult for them to complete their tasks.

User training was found as one of the challenges faced post implementation. During the study, it is found that 77% of the respondents were given training only once while only 40% agreed about the effectiveness of the training.

Another key success element identified by 70% of respondents is an improvement in data access accuracy and reliability. Effective communication within the organization's management team, as well as post-installation support, were also identified as essential success factors for ERP deployment. The most significant challenges found during ERP implementation were insufficient project planning and management, organizational culture resistance to change, and a lack of clear communication and coordination among stakeholders.

5.3 Conclusion

Based on the research findings, I have drawn meaningful conclusions that provide valuable insights for ILRI and other organizations considering or undergoing ERP implementation. The conclusions highlight the importance of proper planning, stakeholder engagement, effective communication, and continuous evaluation throughout the ERP deployment process. Furthermore, the conclusions emphasize the significance of organizational commitment, training programs, and ongoing support to ensure successful ERP adoption and utilization.

The study concludes that the implementation of Unit 4 Enterprise Resource Planning (ERP) in International Livestock Research Institute (ILRI) has the potential to improve Supply Chain Management (SCM) performance. However, successful implementation relies on addressing critical success factors, overcoming challenges, and ensuring effective user adoption through adequate training and user involvement.

5.4 Recommendations

Several recommendations can be conducted for ILRI to maximize the benefits of the ERP system and ensure its long-term success. These recommendations include developing a comprehensive change management strategy, investing in user training

and education, fostering a culture of continuous improvement, establishing a dedicated support team, and regularly evaluating the system's performance and user satisfaction.

To achieve a seamless implementation process, organizations wanting to install ERP systems in SCM should prioritize proper project planning and management. Addressing company culture-based resistance to change is critical for successful ERP deployment. Organizations should prioritize change management methods and cultivate an open and adaptable culture. To increase user adoption and reduce opposition to the new system, comprehensive user training programs should be devised and implemented. It is recommended that the ERP deployment process be evaluated on a regular basis using appropriate metrics to quantify success and identify areas for improvement. Further study should be carried out to investigate additional difficulties and potential solutions that are unique to the business or industry setting. Given the good feedback on improved data access and retrieval, companies should prioritize data governance standards and procedures.

These recommendations aim to address the areas identified in the study's findings and support organizations in optimizing the benefits derived from ERP implementation. By focusing on user training, change management, continuous evaluation, data governance, and strategic alignment, organizations can enhance the overall effectiveness and success of their ERP systems.

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Appendices

Addis Ababa University

School of Commerce, Department of project Management

Questionnaires to be filled by employees of International Livestock Research Institute (ILRI)

Dear respondents.

I am a postgraduate student at the School of Commerce, Addis Ababa University, currently conducting research on the topic of "**THE EFFECT OF ERP SYSTEMS IN SUPPLY CHAIN MANAGEMENT: IMPLEMENTATION OF UNIT 4 ERP IN A RESEARCH INSTITUTE**" This research forms part of my Master of Project Management program requirements. The information collected in this survey will be kept strictly confidential. Your responses will be anonymous, and no personally identifiable information will be collected. I sincerely appreciate your time, willingness, and participation in advance.

1. What is your age?

   18-25 ☐ 26-35 ☐ 36-45 ☐ 46-55 ☐ 56 and above

2. Which organization do you work for?

   ☐ ILRI ☐ Hosted.

3. Which department are you working in?

   Admin ☐ Finance ☐ Hospitality ☐ ICT ☐

   Liaison ☐ HR SCM ☐ Security Other ☐

4. Do you use an Enterprise Resource Planning Software in your organization or department?

   Yes ☐ No ☐

5. How long have you been using Unit 4 Agresso ERP System?

   Less than a year ☐ 1-3 Years ☐ 3-5 Years ☐ More than 5 Years ☐

6. Please indicate the extent to which you agree or disagree with the following statement: "ERP implementation has improved the efficiency in my day-to-day tasks".

Strongly Agree ☐ Agree Neutral ☐ Disagree ☐ Strongly Disagree ☐

7. "ERP system has enhanced my ability to access and retrieve information easily".

Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly Disagree ☐

8. “ERP implementation has streamlined our business processes and workflows".

Strongly Agree ☐ Agree ☐ Neutral Disagree ☐ Strongly Disagree ☐

9. "The ERP system has improved the accuracy and reliability of data entry and retrieval".

Strongly Agree ☐ Agree Neutral ☐ Disagree Strongly Disagree☐

10. "ERP implementation has increased collaboration and communication among different departments within our organization".

Strongly Agree ☐ Agree Neutral☐ Disagree ☐ Strongly Disagree ☐

11. "My overall productivity has increased since the implementation of the ERP system".

Strongly Agree ☐ Agree Neutral ☐ Disagree ☐ Strongly Disagree

12. The ERP system has facilitated better decision-making in my role".

Strongly Agree ☐ Agree Neutral ☐ Disagree ☐ Strongly Disagree☐

13. To what extent has the ERP implementation improved the quality of your work outcomes?

Greatly Improved ☐ Improved ☐ Remained the same Declined ☐

Greatly Declined ☐

14. How often did the organization provide user training and support during the ERP implementation?

Yearly ☐ Quarterly ☐ Monthly ☐ Weekly ☐ Once

15. How effective was the user training and support during the ERP implementation?

Very Effective ☐ Effective ☐ Moderately ☐

Effective Ineffective ☐ Very ineffective ☐

16. Please rate your level of agreement or disagreement with the following statement: "ERP implementation has positively impacted our organization's financial performance."

Strongly Agree ☐ Agree ☐ Neutral ☐ Disagree ☐

Strongly Disagree ☐

17. To what extent do you agree or disagree with the statement: "ERP implementation has reduced operational costs within our organization."

    Strongly Agree ☐ Agree Neutral ☐ Disagree ☐

    Strongly Disagree ☐

18. Please rate the level of difficulty your organization faced in addressing the following challenges during the ERP implementation: Data migration and cleansing.

    ☐ High Difficulty ☐ Moderate Difficulty

    ☐ Low Difficulty ☐ No Difficulty

19. Please rate the level of difficulty your organization faced in addressing the following challenges during the ERP implementation: System customization and configuration.

    ☐ High Difficulty ☐ Moderate Difficulty
    ☐ Low Difficulty ☐ No Difficulty

20. Please rate the level of difficulty your organization faced in addressing the following challenges during the ERP implementation: User training and education.

    ☐ High Difficulty ☐ Moderate Difficulty ☐ Low Difficulty
    ☐ No Difficulty

21. Please rate the level of difficulty your organization faced in addressing the following challenges during the ERP implementation: Change management and employee engagement.

    ☐ High Difficulty ☐ Moderate Difficulty ☐ Low Difficulty
    ☐ No Difficulty

22. To what extent did the following factors contribute to the challenges faced during the ERP implementation process? Inadequate project planning and management.

    ☐ Strongly Contributed ☐ Contributed
    ☐ NeitherHindered ☐ Strongly Hindered

23. To what extent did the following factors contribute to the challenges faced during the ERP implementation process? Insufficient budget and resources allocated for implementation.

☐ Strongly Contributed ☐ Contributed

☐ Neither Hindered ☐ Strongly Hindered

24. To what extent did the following factors contribute to the challenges faced during the ERP implementation process? Lack of clear communication and coordination among stakeholders.

☐ Strongly Contributed ☐ Contributed Neither

☐ Hindered ☐ Strongly Hindered

25. To what extent did the following factors contribute to the challenges faced during the ERP implementation process? Resistance to change from organizational culture.

☐ Strongly Contributed ☐ Contributed ☐ Neither

☐ Hindered. ☐ Strongly Hindered

26. How effectively were the challenges addressed during the ERP implementation process?

☐ Very Effectively ☐ Effectively ☐ Moderately Effectively

☐ Ineffectively ☐ Very Ineffectively

27. How satisfied are you with the overall usability and user-friendliness of the ERP system?

☐ Very Satisfied ☐ Somewhat Satisfied ☐ Neutral

☐ Somewhat Dissatisfied ☐ Very Dissatisfied

28. Overall, how satisfied are you with the ERP system?

☐ Very Satisfied ☐ Somewhat Satisfied ☐ Neutral ☐ Somewhat

☐ Dissatisfied ☐ Very Dissatisfied

Interview Questions

Below are interview questions provided for managers and ERP implementers of the project areas.

1. What were the criteria's for ILRI to be motivated to implement ERP project?
2. What were the strengths and weaknesses of implementing ERP?
3. Which challenges did the ERP implementers and management tried to mitigate to make the ERP project successful?
4. Were there any major challenges related to project scope, user adaption and change management?
5. What were the benefits in implementing ERP project in the SCM?