IMPACT OF ENTERPRISE RESOURCE PLANNING (ERP) SYSTEMS IN ENHANCING PHARMACEUTICAL WAREHOUSE SUPPLY CHAIN EFFICIENCY: A CASE STUDY OF JOINT MEDICAL STORE UGANDA (JMS)

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A DISSERTATION SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF A DEGREE OF BACHELOR OF PROCUREMENT AND LOGISTICS MANAGEMENT OF UGANDA CHRISTIAN UNIVERSITY

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UGANDA CHRISTIAN UNIVERSITY

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DECLARATION

As per the university values of integrity and diligence, I have not received any unauthorized assistance while working on this project. I, SIFA UYERGIU, hereby declare that the work is authentically mine and to the best of my knowledge, it contains no traces of plagiarism or any other unethical practices. The only work used that has already been published by other persons has been purely for reference purpose

Signature .....

Date 22/04/2026.....

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APPROVAL

I hereby certify that the research report titled, "Impact of ERP Systems in Enhancing Pharmaceutical Warehouse Supply Chain Efficiency " has been submitted by Sifa Uyergiu of Reg. No. M23B12/122 for examination with my full approval as the university supervisor.

Signature ----------

Date 22/4/2026

MRS. COMFORT TUMUHAMYE

DEDICATION

I dedicate this piece of work to the Almighty God who guided, strengthened and empowered me with wisdom in the course of study. It was a challenging task which required a lot of patience, time but the Lord's presence was with me.

I also dedicate this work to my parents UYERGIU YOMBE PATRICK and NAOME DHURIRA IRACAN for what they did for me. May God bless you a hundredfold.

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ABSTRACT

This study examined the impact of Enterprise Resource Planning (ERP) systems on enhancing pharmaceutical warehouse supply chain efficiency at Joint Medical Store (JMS), Uganda. The study was driven by the need to evaluate the effectiveness of ERP systems in enhancing warehouse operational efficiency and resolving issues such as stock inaccuracy, delayed order fulfillments and the high cost of warehouse operations in pharmaceutical supply chains.

The survey involved 40 respondents drawn from a population of 45 people who were engaged in warehouse management at Joint Medical Store (JMS). The respondents were selected through purposive and simple random sampling. Data was collected through questionnaires using Likert scale questions, and secondary data from journals, reports and corporate documents. The data was analyzed using descriptive statistical methods such as frequency, percentage and mean, and the findings were presented in tabular and graphical form.

The findings indicated that the use of ERP systems improves inventory management through real-time tracking, reduction in manual errors, and improved communication between departments. Further, the process automation provided by ERP will enhance order processing speed by decreasing the time taken for order processing and increasing efficiency. The real-time data access provided by ERP supports cost reduction through better inventory planning, stock-outs and financial management. The research found ERP systems are essential in improving the efficiency of pharmaceutical warehouse supply chains at Joint Medical Store. The study recommends strengthening ERP integration across departments, continuous staff training, and improved system utilization to maximize ERP benefits.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter introduced the research on impact of Enterprise Resource Planning systems in enhancing pharmaceutical warehouse supply chain efficiency by providing the background of the study, statement of the Problem and outlining the purpose, Scope of the Study, objectives and research questions that guided the investigation. Additionally, it presented the justification, and limitations.

1.1 Background of the Study

Enterprise Resource Planning (ERP) systems are integrated software platforms designed to streamline organizational processes by unifying functions such as procurement, inventory control, finance, human resource management, and logistics into a single digital system (Olusola & Adepoju, 2021). This integration enabled real-time sharing of data, improved decision-making, and reduced operational redundancies. In the pharmaceutical sector, ERP systems improved warehouse management through automation and real time inventory tracking (Agyapong et al., 2022).

At the international level, ERP systems became unavoidable tools for organizations seeking competitive advantage and operational excellence. Many (multinational) pharmaceutical manufacturers such as Pfizer, Novartis, and GlaxoSmithKline, implemented SAP, Oracle and Microsoft Dynamics ERP systems to manage procurement, manufacturing, warehouse, and distribution (Gunasekaran et al., 2021). This integration enabled real-time tracking of supply chain activities, improved compliance with Good Distribution Practices (GDP) and mitigated the risk of stock-outs and wastage. Furthermore, ERP also enabled batch tracing and expiry date monitoring to enhance product quality and service levels (Singh et al., 2020).

The East and Southern African region has had challenges in pharmaceutical supply chains due to incomplete systems, lack of automation, and poor visibility across supply chain nodes (Ochieng, 2021). The African Union Development Agency (AUDA, 2022) estimated that about 40% of medicines are wasted and lost due to manual inventory management and coordination. But recent ERP adoption in the region showed progress. For example, the Mission for Essential Drugs and Supplies (MEDS) in Kenya adopted ERP solutions, which

streamlined order processing, reduced stock-outs by 25%, and improved the reporting process (Ochieng, 2021). Similarly, South Africa's Department of Health adopted ERP-based e-logistics platforms that strengthened medicine distribution to public hospitals and reduced delays (Mthembu, 2020).

In Uganda, the national pharmaceutical supply chain was the backbone of health service delivery. Organizations like National Medical Stores (NMS) and Joint Medical Store (JMS) manage procurement, storage and distribution of medicines to public and faith-based health institutions (Kintu & Ssali, 2021; JMS Annual Report, 2022). While these institutions have adopted ERP systems, they still experience problems such as poor stock accuracy, prolonged order processing times and low-levels of integration among departments. Yet issues like stock-outs and under-utilization of the system remained (Mwesigwa, 2020; Kintu & Ssali, 2021), creating the need to empirically investigate the role of ERP systems on warehouse supply chain efficiency in Uganda's pharmaceutical industry.

While global and regional studies reported positive associations between the adoption of ERP systems and supply chain performance (Gunasekaran et al., 2021; Ochieng, 2021), there was little evidence on the use of ERP systems in Uganda's pharmaceutical warehouses. These studies are mostly centered on manufacturing or logistics and less on pharmaceutical operational needs. There was also little evidence on how ERP use enhances warehouse efficiency. This highlighted the need to assess the impact of ERP systems on warehouse supply chain efficiency at JMS to provide up-to-date and relevant information for policymaking and practice.

1.2 Problem of the statement

Pharmaceutical supply chains that were efficient, ensured timely supply of medicines through seamless integrated automatic ERP systems that give real-time inventory visibility and facilitate order processing. These systems' functionality should have integrated procurement, warehousing, and distribution to facilitate accurate inventory control, timely orders processing and coordination across departments (Ochieng, 2021; AUDA, 2022).

Yet, in the pharmaceutical industry in Sub-Saharan Africa, and in Uganda, with institutions such as National Medical Stores (NMS) and Joint Medical Stores (JMS), inaccurate inventory status, delayed orders, lack of integration, and communication between departments were not uncommon (Kintu & Ssali, 2021; Mwesigwa, 2020). Therefore, this study seeks examined the impact of ERP systems on enhancing pharmaceutical warehouse supply chain efficiency in Uganda at JMS.

1.3 Purpose of the study

The purpose of this study was to assess the impact of Enterprise Resource Planning (ERP) systems on enhancing pharmaceutical warehouse supply chain efficiency at Joint Medical Store (JMS), Uganda.

1.5 Objectives of the study

i. To evaluate how ERP system integration influenced inventory accuracy in pharmaceutical warehouses at JMS.
ii. To examined the effect of ERP-driven process automation on order fulfillment speed in JMS warehouses.
iii. To determine the impact of ERP-enabled real-time data access on cost reduction in pharmaceutical warehouse operations.

1.6 Research questions

i. How did ERP system integration affect inventory accuracy in pharmaceutical warehouses at JMS?
ii. What was the effect of ERP-driven process automation on order fulfillment speed at JMS?

iii. How did ERP-enabled real-time data access influence cost reduction in pharmaceutical warehouse operations at JMS?

1.7 Scope of the study

The scope of the study covered three dimensions that is; content, geographical and time and these are discussed in detail below.

1.7.1 Content scope

The study focused on the impact of Enterprise Resource Planning (ERP) systems on pharmaceutical warehouse supply chain efficiency, specifically examining four key dimensions of ERP systems: system integration, process automation, real-time data access, and user adoption.

1.7.2 Geographical scope

This study was carried out from Joint Medical Store (JMS) headquarter located at Plot 1828 Gogonya Road, Nsambya, which is within the Makindye Division of Kampala, Uganda.

1.7.3 Time scope

The study covered the period from 2019 to date, focusing on the years during which ERP systems have been actively implemented and utilized at the Joint Medical Store (JMS).

1.4 General objective

i. To assess the impact of Enterprise Resource Planning (ERP) systems on enhancing pharmaceutical warehouse supply chain efficiency at Joint Medical Store (JMS), Uganda.

1.5 Justification of the Study

i. Addresses the limited empirical research on the impact of ERP systems on pharmaceutical warehouse supply chain efficiency in Uganda, specifically at JMS.
ii. Provided guidance for policymakers, managers, and IT specialists on how ERP system integration, process automation, real-time data access, and user adoption can improve operations.

iii. Assisted in the optimization of ERP implementations to improve stock level accuracy, avoid stock-outs, fulfil orders, reduce costs and improve the timely delivery of medicines.

iv. Contributed to the knowledge of technology-based supply chain improvements in the field of Procurement and Logistics Management in developing countries.

1.6 Limitations of the study

i. The study was limited to the Joint Medical Store (JMS) in Uganda, which may affect the generalization of the findings to other pharmaceutical warehouses.

ii. Reliance on primary data from employees and management may lead to over- or under-reporting of ERP system performance.

iii. The study focused on the period from 2019 to date, which may not capture long-term trends or future changes in ERP utilization and supply chain efficiency.

iv. Limited time and resources may restrict the depth of data collection and analysis.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter provides an overview of the current literature related to the effect of Enterprise Resource Planning (ERP) systems on pharmaceutical warehouse supply chain efficiency. It starts with the definition of the key variables of interest, namely ERP systems and pharmaceutical warehouse supply chain efficiency. The chapter proceeds into the second stage of the research question, presenting a review of previous research on the impact of ERP systems on inventory accuracy, on order fulfilment time through automation of processes, and on cost reduction through real-time information availability.

2.1 Definition of Key Variables

2.1.1 Enterprise Resource Planning (ERP) systems

Enterprise Resource Planning (ERP) systems are integrated software systems that streamline and integrate key business functions, including finance, procurement, inventory, human resources and supply chain management (SAP, 2025). Through data and process integration, ERP systems facilitate real-time data exchange, eliminate data duplication and streamline communication and collaboration among departments, contributing to improved efficiency and effectiveness of the organization (Al-Assaf, 2025). ERPs offer real-time data access, centralized control and improved inter-departmental communication, leading to greater efficiency in workflows, data accuracy and better decision-making (RightPeople Group, 2024; IBM, 2023). Through automation of mundane and time-consuming tasks, ERP allows employees to concentrate on more productive tasks to deliver productivity and operational efficiency (Field Insight, 2025).

In the context of supply chains in pharmaceuticals, ERPs enable integration of procurement, inventory, and distribution processes which is essential for timely access to medicines and adherence to regulatory requirements. ERP systems facilitate inventory accuracy by enabling real-time stock monitoring and automatic replenishment notifications, thus preventing stock outs and wastage through expired stock (Juleb, 2025; ERP Absolute, 2025). Moreover, centralized databases provide audit trails that facilitate adherence to healthcare regulations and quality control measures (Al-Assaf, 2025).

ERP systems improve data accuracy, reduce manual data entry errors, streamline processes and facilitate communication within the pharmacy (Moon, 2007; Al-Assaf, 2025). Specifically, ERP integration enables cost reduction, inventory turns and customer satisfaction through on-time delivery of goods and services (ERP Absolute, 2025). However, ERP implementation is expensive in terms of technological infrastructure, human resource and change management to overcome questions and resistance (Itagi, 2023).

Besides inventory management, ERP systems help in order processing and distribution through automation of processes, demand management and visibility of supply chain (Huang & Handfield, 2021). This in turn facilitates faster processes and order accuracy to improve customer satisfaction and create efficient healthcare processes (Patel & Desai, 2020). ERP usage is positively associated with critical warehouse performance metrics such as order fill rate, delivery time and warehouse efficiency across both commercial and health care (Moon, 2007; Mugisha et al., 2022).

2.1.2 Pharmaceutical warehouse supply chain efficiency

Efficient supply chains play a crucial role in the healthcare industry, especially in pharmaceutical supply chains, as timely access to medicines can impact patient care and health (Emmanuel & Hadejia, 2024; Donato, Parry, & Roth, 2016). Efficiency in these supply chains includes efficient inventory management, few stock outs, timely delivery of orders and proper storage and handling of medications (Emmanuel & Hadejia, 2024). Worldwide, pharmaceutical supply chains suffer from inefficiencies such as disjointed operations, stock outs, slow order processing and wastage through expiry that drive up healthcare costs and hinder patient outcomes (World Health Organization, 2024). Effective pharmaceutical warehouses reduce both the cost of operations and availability of medicines by embracing improved supply chain practices and technologies.

Pharmaceutical warehouses in low-and-middle-income countries are particularly challenged by infrastructure limitations, lack of integration between supply chain functions and limited use of digital technologies (African Union Development Agency-NEPAD, 2025; Ssebibubbu, Kibira, & Lubanga, 2025). Research shows that even with central stock availability, medicine shortages are common in health facilities because of logistics bottlenecks such as poor quality of inventory data, slow order processing and sub-optimal distribution planning (PATH, 2025). Modern information technologies such as Enterprise Resource Planning (ERP) have emerged as promising solutions to solve these problems by providing integrated and real-time

information sharing among stakeholder parties (Fosso Wamba, Ben Letaifa, & Gnanzou, 2023).

The key performance indicators of pharmaceutical warehouse supply chain efficiency include accuracy, lead time, fill rate and waste reduction. Studies in sub-Saharan Africa show that ERP and other information systems have a positive impact on these metrics through automation, forecasting and coordination (AccelerateHSS, 2023; Global Health Supply Chain Program, 2023). For example, intervention studies demonstrate that ERP systems in warehouse management lead to reduced stock outs, quicker order processing and higher pharmaceutical regulatory adherence (Lugada et al., 2022). But there are challenges in adopting the technology, specifically in training, infrastructure and culture change, which affect the effectiveness of these systems on warehouse productivity.

2.2 The Effect of ERP system integration on inventory accuracy in pharmaceutical warehouses.

ERP system integration is the integration of different functions of an organization including procurement, warehouse, inventory management and distribution through a unified electronic system that enables the sharing of information and control in real time (Olusola & Adepoju, 2021). In pharmaceutical warehouses, inventory accuracy is essential to ensure stock availability, avoid stock-outs or excess stock, and comply with Good Distribution Practices (GDP) guidelines. ERP integration provides transparency throughout the supply chain, allowing warehouse managers to track inventory levels, resolve stock mismatches and produce reliable inventory status reports. Through real-time linking of procurement orders, delivery records, and stock movements, ERP systems eliminate manual errors, avoid stock mismanagement, and bring in predictive inventory management, enabling managers to forecast stock shortages or excesses in advance, improving service levels and efficiency.

International and regional research underscores the benefits of ERP integration in enhancing inventory accuracy. Gunasekaran, Subramanian, and Rahman (2021) noted that global pharmaceutical firms (Pfizer and Novartis) improved inventory accuracy when they deployed integrated ERP systems. ERP integration eliminated manual data entry errors, eliminated duplicates and ensured that procurement, storage and distribution processes are coordinated. In line with this, Agyapong, Mensah, and Boateng (2022) observed that firms with integrated ERP systems in pharmaceutical companies in Ghana had higher stock visibility, lower

expired stock, and the ability to track stock at batch level, which enhanced inventory accuracy and warehouse performance.

In the region, integration of ERP systems has been observed to enhance data quality and timeliness. Sudarmi and Sunaryo (2024) noted that companies adopting fully integrated ERP systems showed improved accuracy of inventory records and efficiency in inventory management through real-time data processing and elimination of human errors. Mbago and Mogikoyo (2024) also identified that, in East Africa, integrated ERP systems that linked internal functions and suppliers allowed real-time inventory monitoring and real-time triggers, which improved the accuracy of inventory information. These observations indicate that integration between ERP modules provides better visibility, coordination and accuracy of inventory information, which is essential for pharmaceutical warehouses.

Centralized data management through ERP integration helps avoid inaccuracies between physical and recorded inventory levels. Alandkar, Kawtikwar, and Sonawane (2025) observed that when integrated with ERP, inventory management allows organizations to minimize manual data entry errors, maintain stock balance, and maintain correct records. Jamila (2025) also indicated that an ERP-based inventory warehouse automation system increased inventory accuracy levels up to 12%, largely due to integrated processes of procurement, inventory, and distribution. Modern ERP systems providing integrated inventory modules with warehouse management and scanning systems (e.g., barcode, RFID) also enhance inventory accuracy. ERP implementation also facilitates predictive inventory management using real-time stock data, foreshadowed stock-outs and re-order points to avoid stock-outs and overstocks (Petra International Journal of Business Studies, 2023; Universal Journal of Pharmacy and Pharmacology, 2024).

But while these advantages are evident, there are some challenges to adopting ERP system integration. Mwesigwa (2020) found that failure to integrate the entire organisation and adopt the system may limit the benefits of ERP systems, leading to inaccurate inventory records. The complexity of ERP could also lead to problems such as implementation failure, high maintenance costs and staff training (Olusola & Adepoju, 2021; Jamila, 2025). These limitations indicate that while the integration of ERP systems may improve inventory accuracy, this is contingent on the configuration, adoption, training and performance of the system.

2.3 The Effect of ERP-driven process automation on order fulfillment speed.

ERP-driven process automation refers to using integrated computer systems to automate standard operational tasks such as order processing, stock picking and packing, shipping schedule management, and data entry (Monczka et al., 2022; Dachepalli et al., 2024). ERP automation eliminates human intervention, manual process bottlenecks, order checking and validation, automatic stock allocation, picking and packing lists, and real-time status updates of the fulfilment process (Olusola & Adepoju, 2021; NetSuite, 2024). This affects the speed and accuracy of processes, which enables warehouse managers to process demand and service requirements (Olusola & Adepoju, 2021; NetSuite, 2024).

The literature supports the impact of ERP automation on order fulfilment. For instance, Gunasekaran, Subramanian and Rahman (2021) found ERP systems with automated processes enabled organisations to minimise order processing times, bottlenecks, and ensure stock was available to meet demand. ERP in a firm, noting the automation of processes reduced manual and operational redundancies. Similarly, Agyapong, Mensah and Boateng (2022) reported that ERP automation in the pharmaceutical industry allowed real time stock availability, automatic product allocation and easy picking, which improved time taken to process orders and customer service.

ERP process automation also helps improve inter-departmental co-ordination. ERP automation of processes allows procurement, warehouse and distribution managers to collaborate as part of a process with automatic triggering of notifications, prioritise work and report on status. Mbago and Mogikoyo (2024) noted that automatic task allocation eliminates the time wasted tracking down tasks, while robotics and warehouse picking systems, which are often integrated with ERP systems, helps to increase productivity and reduce cycle time with better delivery schedules (Banur et al., 2024; Ikram Moalla et al., 2018).

This interdepartmental collaboration ensures timely communication of information across departments, and removes communication as well as coordination issues. But some potential factors that might reduce the effect of automation driven by ERP, such as the complexity, configuration or training of the system can lead to reduced speed. Resistance to change or process adoption can also result in delays even with the use of systems like advanced ERP systems (Moons et al., 2023). Reliance on automation without human input could result in errors in stock allocation or unacknowledged differences in orders (Mwesigwa, 2020). These findings indicate that while automation using ERP has the potential to boost efficiency, the full benefits are realised only when the system is installed correctly, training and monitoring of the system is provided.

2.4 ERP-enabled real-time data access influence cost reduction in pharmaceutical warehouse operations.

Real-time data access in an integrated ERP system is the ability of the ERP system to provide rapid (fast), current (real-time) access to operational, financial, and inventory information in the warehouse and supply chain (Olusola & Adepoju, 2021; Monczka et al., 2022). In a pharmaceutical warehouse environment like that at JMS, real-time information is critical to managing the costs of holding stock, stock outs, expiries, staff productivity and procurement. Real-time data enables managers to track inventory movements, batch numbers and expiry dates, plan procurement timing, and manage resources. Overall, these functionalities contribute to cost reduction by facilitating timely, accurate and informed decision-making (Gunasekaran, Subramanian, & Rahman, 2021; Agyapong, Mensah, & Boateng, 2022).

Tulli (2023) found that pharmaceutical warehouses adopting ERP dashboards with real-time inventory and financial data reduced storage and handling costs by 15–25% due to improved stock rotation, minimization of emergency procurement, and avoidance of overstocking. Similarly, Sudarmi and Sunaryo (2024) observed that real-time monitoring allowed managers to identify slow-moving or obsolete stock early, preventing financial losses associated with expired products. The integration of ERP with supplier data improved demand forecasting and procurement planning, resulting in lower procurement costs and minimization of unnecessary warehouse expenditures (Mbago, 2024).

Real-time data access also enhances operational and labor efficiency. Automated alerts, to-do lists, and workflow analysis minimise the need for manual inventory counting, reconciliation and reporting (NetSuite, 2024; Dachepalli et al., 2024). Moalla et al. (2018) demonstrated that warehouses using ERP dashboards could allocate staff more efficiently based on real-time operational demands, leading to decreased overtime costs. Real-time data also reduces errors caused by delayed information, preventing double-orders, misplaced stock, and emergency procurement expenditures (RwAve, 2024; Singleclic, 2024).

Moreover, ERP-enabled dashboards support strategic cost management. Real-time data allows managers to more accurately evaluate the turnover of stock, re-order levels and warehouse space which can reduce holding costs by 20-30% (Patra, 2024; MoldStud, 2025; Arrow Research Corporation, 2024). The ability to forecast demand variations, track supplier

reliability and identify early warning signs for problems ensures that business operations align with financial efficiency.

Real-time data also allows for quick detection of anomalies such as stock inconsistencies between inventory records and physical stock, avoiding costly write-offs and fines in the case of pharmaceuticals (Dhoke, 2025). Real-time dashboards may not be as effective if technical problems, such as system outages, lack of integration, slow updates, or incorrect data entry, occur (Mwesigwa, 2020; Moons et al., 2023). Employees may not be well trained to interpret or respond to the dashboards, reducing the system's effectiveness and delaying corrective measures. Relying too heavily on automation without human review can lead to unanticipated issues, such as stock misallocations or errors, which can increase costs (Kamaldeen Smith, 2024).

Additionally, initial setup costs (system setup and change management) may exceed the anticipated cost savings until the system is fully trained and integrated, and staff are familiar with its use (Dachepalli et al., 2024). Real-time data access through ERP systems has significant potential for cost reduction in pharmaceutical warehouse management through better inventory management, waste reduction, workforce optimization, and procurement management. For JMS, implementing integrated real-time ERP dashboards offers a means for improving warehouse efficiency and saving costs. These opportunities can only be realized with appropriate system setup, staff training, monitoring of data integrity, and management oversight.

Leveraging real-time data maximizes the impact of ERP investments, contributing to cost reduction and financial benefits while supporting timely medication delivery and regulatory adherence (Petra International Journal of Business Studies, 2023; Universal Journal of Pharmacy and Pharmacology, 2024).

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter discussed the research methodology that will be applied in the study Impact of ERP Systems in Enhancing Pharmaceutical Warehouse Supply Chain Efficiency at Joint Medical Store (JMS). This chapter outlined the research design, sampling method, sample size, data sources, data collection tools, data collection process and reliability and validity.

3.1 Research Design

This research used a quantitative research design to gather and statistically analyze quantitative data to assess the effects of Enterprise Resource Planning (ERP) systems on warehouse supply chain efficiency in JMS pharmaceuticals. The research involved the administration of a questionnaire with closed-ended and Likert-scale questions to measure variables such as the integration of the ERP system, inventory accuracy, lead time reduction and order fulfillment. The quantitative method was suitable as supply chain efficiency was assessed using performance metrics that provided objective measures of the association between ERP deployment and performance.

3.2 Sampling Techniques

Purposive sampling and simple random sampling were used. Purposive sampling was applied to select key staff who used the ERP system - such as warehouse, procurement, ICT and inventory units - as they knew how the ERP system worked. Simple random sampling was used then to select other staff to ensure that each of them had an equal chance of being selected and for this reason, it increased the validity of the findings.

3.3 Sample Size

The population of the study was 45 Join Medical Store (JMS) employees involved in the warehouse operations such as warehouse managers, inventory officers, IT management and distribution. Yamane's (1967) formula was used to calculate the sample size:

$n = N / [1 + N(e^2)]$

Where:

n = Sample size

N = Population size (45)

e = Margin of error (typically 0.05 or 5%

$n = 45 / [1 + 45(0.05^2)]$

= 45 / 1+45(0.0025)

=45/1+0.1125

=45/1.1125

=40.45

=40 respondents

3.4 Data Collection Sources

Primary and secondary data sources were used.

3.4.1 Primary Data Sources

Primary data collection in the study involves collecting original data from Joint Medical Store (JMS) employees via questionnaires, interviews and observations, allowing for targeted and accurate data collection according to the study goal.

A questionnaire was used in this study with 40 respondents from warehouse management, procurement, IT/ERP, and logistics functions, with closed-ended and 5-point Likert scale questions to assess ERP system adoption, inventory accuracy, lead times, order processing and implementation issues. JMS warehouse observations were conducted to verify the use of ERP system in practice, by observing workflows and system screens.

3.4.2 Secondary Data Sources

Secondary Data Collection involved the collection of existing information related to the study from documentary evidence such as JMS reports, audit manuals and journals, and also reliable online databases.

This data provided an essential context, helped in triangulation of data and aided in identifying patterns and gaps in the adoption of ERP in the pharmaceutical supply chain. This data was vital to situate the study in the existing body of knowledge and complement primary data findings.

3.5 Data Collection Instruments

Questionnaires were used as the data collection instrument for the study.

3.5.1 Questionnaires

Structured questionnaires were used for a larger sample. These will consist of closed- and Likert-type questions to gather quantitative information about the ERP components and warehouse supply chain.

3.5.2 Observations

The researcher observed JMS warehouses to determine the ERP systems activities, processes and practices.

3.6 Data Collection Procedures

The researcher requested the permission to conduct the study from the management of Joint Medical Store (JMS). Once permission was granted, the researcher explained the study to the respondents and assured them of confidentiality. Data collection involved collecting primary data through questionnaires, interviews and observations. Respondents were given questionnaires, which were collected later, and observations were conducted in the warehouse to observe the use of the ERP system.

3.7 Data validity and reliability

Reliability was achieved by administering the same questionnaires and interviews to all respondents, while validity was achieved by ensuring that the questions asked were relevant to the research questions and literature on ERP and supply chain efficiency, and by using multiple sources of data (questionnaires, interviews, observations).

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND PRESENTATION OF FINDINGS

4.0 Introduction

This chapter discusses the data analysis, interpretation and presentation of the findings of the research on Impact of ERP Systems in Enhancing Pharmaceutical Warehouse Supply Chain Efficiency at Joint Medical Store (JMS). The information collected from the respondents was analyzed through frequencies, percentages, Likert scale, tables, pie charts and graphs. The chapter is divided into two main sections. Section one discusses the demographic profile of the respondents. Section two reports the study objectives.

4.1 Demographic Characteristics of Respondents

4.1.1 Gender of Respondents

Gender	Frequency	Percentage
Male	17	43
Female	23	57
Total	**40**	**100**

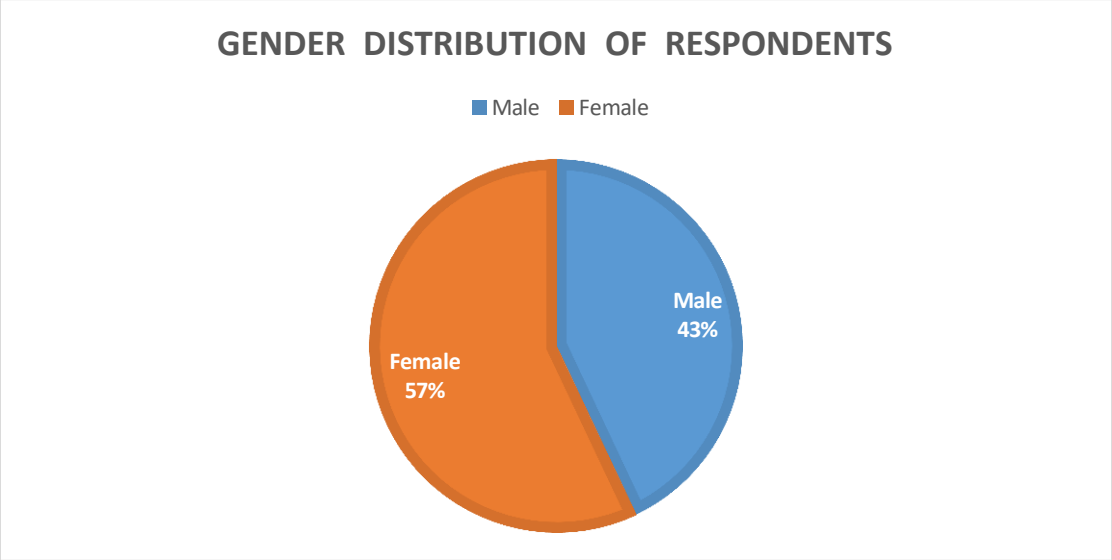


Figure1: Gender distribution of respondents

The majority of the study respondents (57%; 23) were females, while 43% (17) were males. This shows that females represent a considerable number of the employees involved in the

use of ERP systems and in warehouse supply chain processes at Joint Medical Store (JMS). This diversity strengthens the validity of the responses as views were collected from both male and female employees involved in supply chain practices.

4.1.2 Age Bracket of Respondents

Age Bracket	Frequency	Percentage
18-24	9	22.5
25-34	19	47.5
35-44	8	20
55 and above	4	10
Total	**40**	**100**

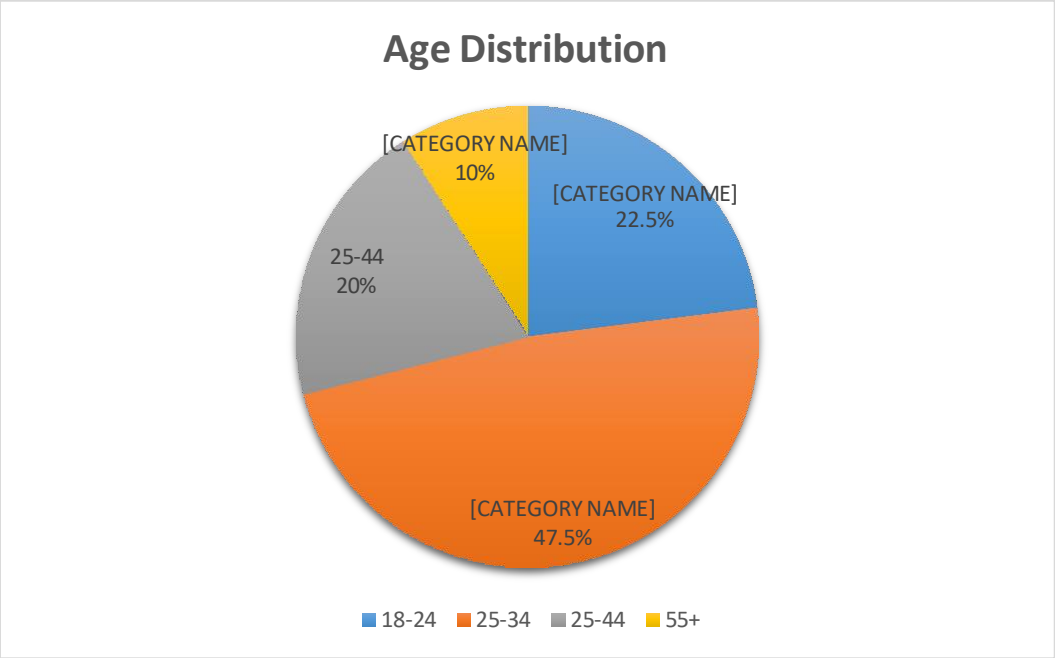
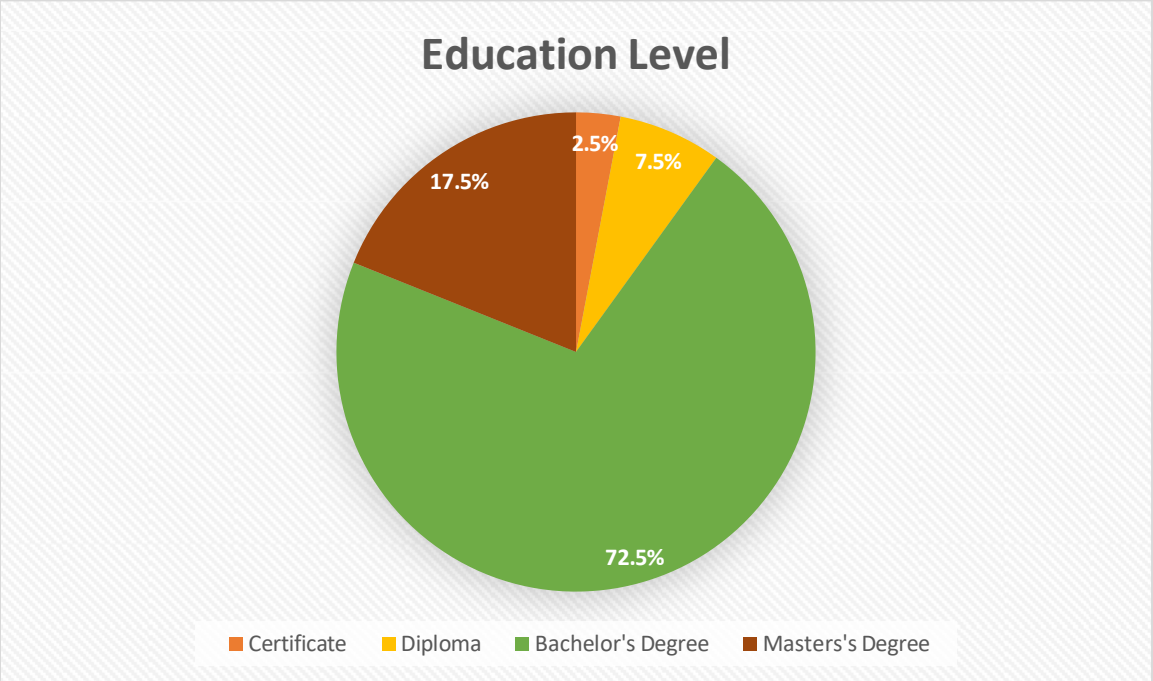


Figure 2: Age of respondents.

The largest age group was 25-34 years (47.5%, 19 employees). This was followed by the 18-24 age group, at 22.5% (9 respondents). The 35-44 years' age group accounted for 20% (8 respondents) and the oldest (55 years and above) 10% (4 respondents). The number of respondents in the 25-34 age group suggest that the company employs a large number of young and computer literate employees.

4.1.3 Education Level

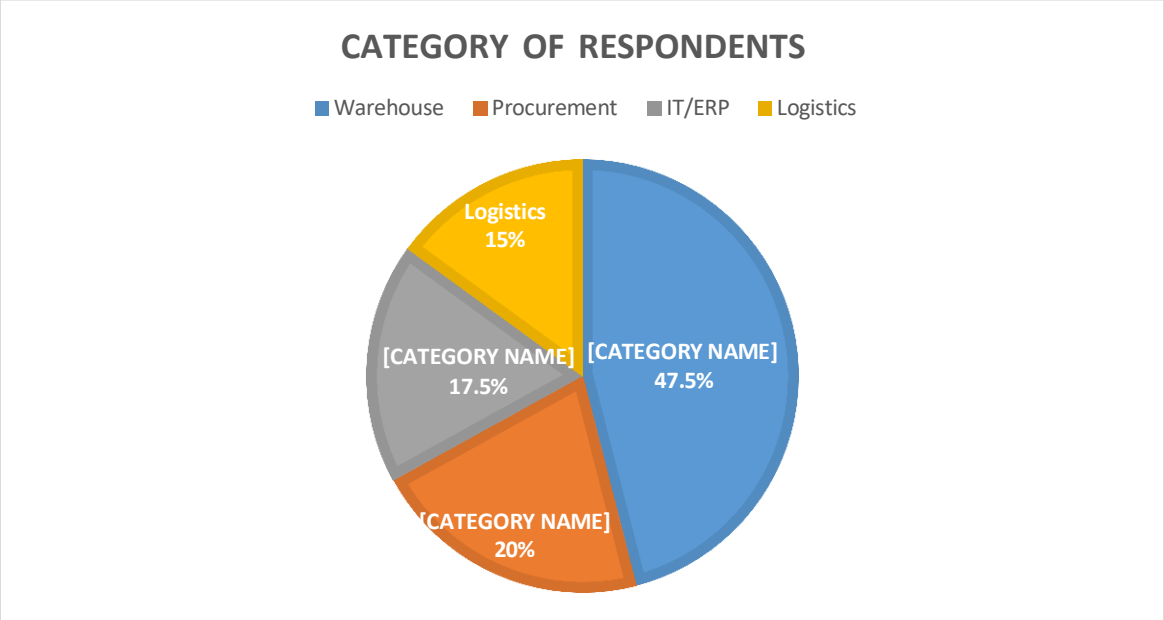
Education Level	Frequency	Percentage
Certificate	1	2.5
Diploma	3	7.5
Bachelor's Degree	29	72.5
Master's Degree	7	17.5
Total	**40**	**100**



The majority of respondents held Bachelor's degrees (71,5 % or 29 respondents). The 17.5% (7 respondents) with Master's degrees indicate the presence of highly trained employees in the company. On the other hand, Diploma holders comprised 7.5% (3 respondents), and Certificate holders made up the smallest portion of respondents at 2.5% (1 respondent). The high percentage of graduates suggests respondents are well-informed and able to understand the operation of ERP systems and the supply chain in warehouses.

4.1.4 Category of Respondents

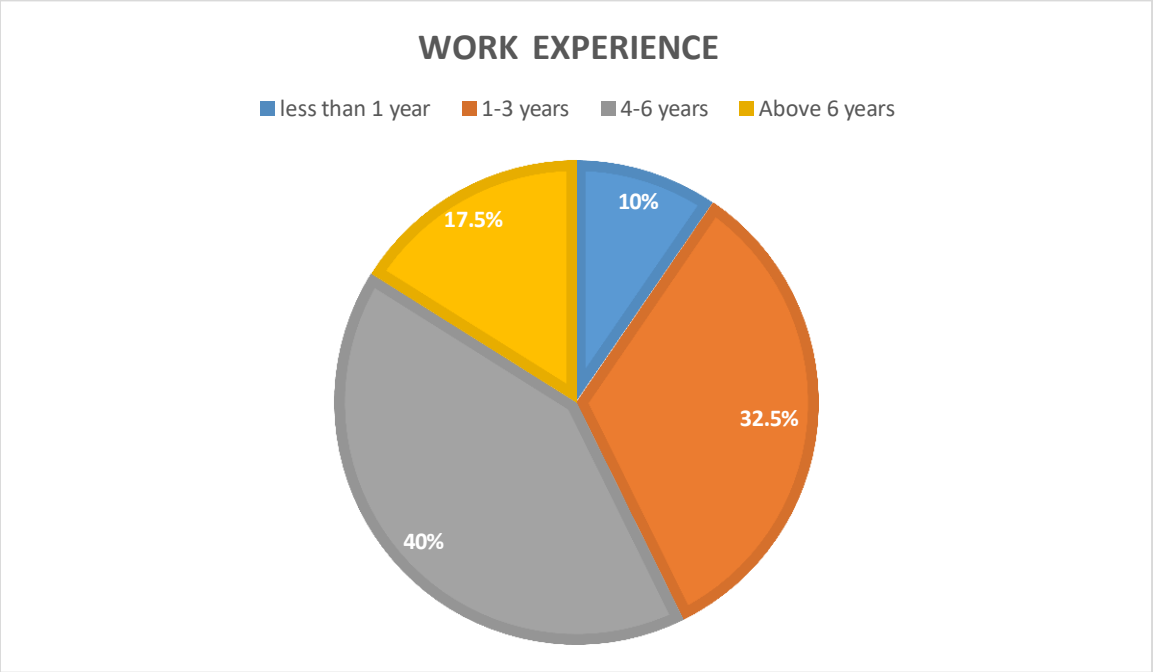
Category	Frequency	Percentage
Warehouse	19	47.5
Procurement	8	20
IT	7	17.5
Logistics	6	15
Total	**40**	**100**



The highest proportion of respondents were warehouse staff (47.5% or 19 respondents). Procurement staff made up 20% (8 respondents) of the sample, and IT staff 17.5% (7 respondents). The smallest proportion (15%, 6 respondents) was from logistics and distribution staff. The representation of warehouse staff was expected as they are the main users of ERP systems in managing inventories and the supply chain. The participation of procurement, IT and logistics staff also allowed us to obtain feedback from all of the departments involved in the implementation process.

4.1.5 Work Experience

Experience	frequency	Percentage
1-3years	4	10
4-6 years	13	32.5
+ 6 years	16	40
Total	7	17.5
	40	**100**

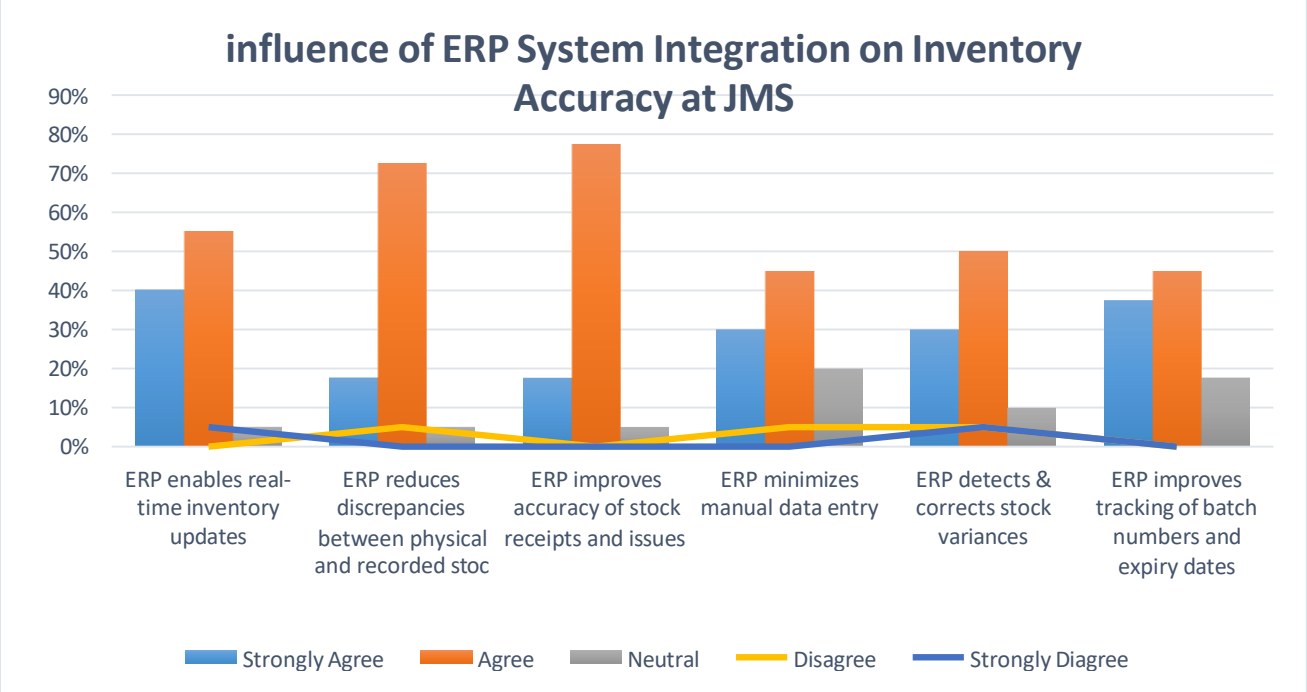


The greatest proportion of respondents was those with 4-6 years of experience (40% or 16 respondents). They were followed by 1-3 years of experience (32.5% or 13 respondents). Staff with 7-9 years of experience were the next largest group, comprising 17.5% (7 respondents) of the total respondents. The smallest percentage of respondents were those with less than one year of experience (10%, 4 respondents). The findings show that most respondents had intermediary experience working at Joint Medical Store. This implies that the respondents had adequate experience with the use of ERP system and warehouse operations, making the responses more reliable.

4.2 Findings Based on Objectives

4.2.1 Objective One: ERP Integration and Inventory Accuracy

S/N	Influence of ERP System Integration on Inventory Accuracy at JMS	SA		A			N	DF	D %	SD F	SD %
		F	%	F	%	F	%	F	%	F	%
1	ERP integration enables real-time update of inventory records	16	40	22	55	2	5	0	0	0	0
2	ERP reduces discrepancies between physical and recorded stock	7	17.5	29	72.5	2	5	2	5	0	0
3	ERP improves accuracy of stock receipts and issues	7	17.5	31	77.5	2	5	0	0	0	0
4	ERP minimizes manual data entry errors	12	30	18	45	8	20	2	5	0	0
5	ERP improves tracking of batch numbers and expiry dates	12	30	20	50	4	10	2	5	2	5
6	ERP helps detect and correct stock variances	15	37.5	18	45	7	17.5	0	0	0	0



The results show that the level of ERP system integration has a positive impact on inventory accuracy at Joint Medical Store (JMS) that is strong. This is seen in the high degree of agreement among the respondents with majority of the respondents affirming that ERP allows real-time update of inventory records and 90% where17.5% strongly agree and 72.5% agree and that ERP minimizes the discrepancies between the physical and system inventory. On the same note, over 95 % of the respondents confirmed that they had improved the accuracy of stock receipts and issues and this supports the effectiveness of ERP systems in improving inventory management.

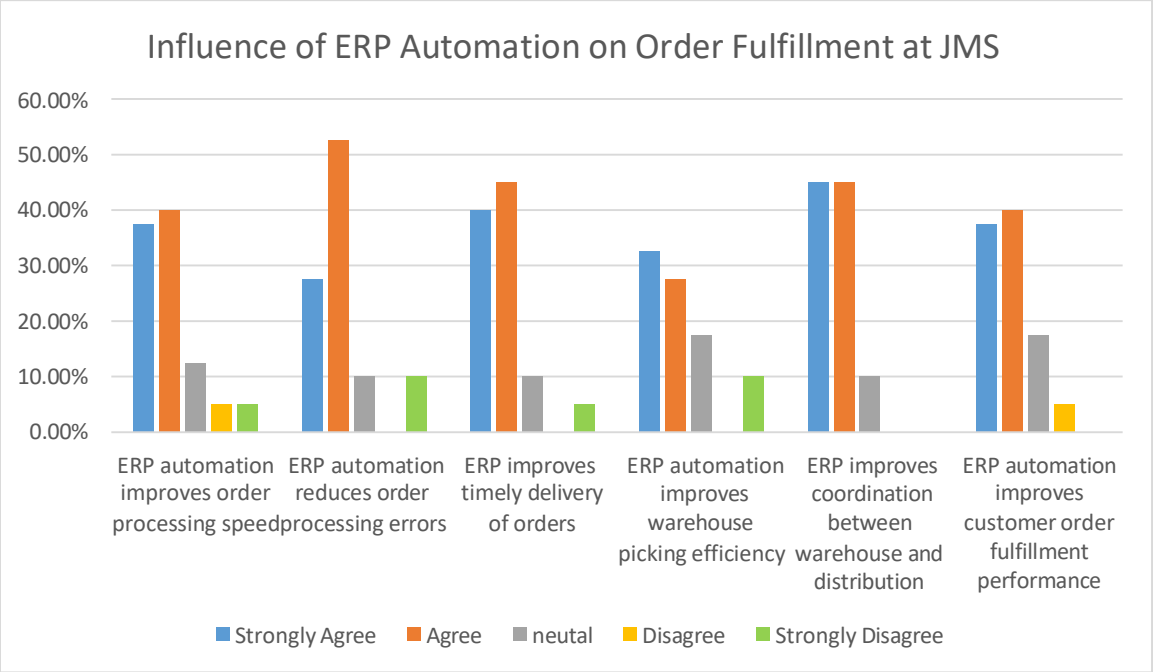
These results indicate that those workers who are directly engaged in activities of the warehouse are more efficient in terms of stock tracking and management because of integration of ERP between departments. The personnel can view and update inventory in real time and this has greatly enhanced the coordination of procurement, warehouse, and distribution. This has led to the better consistency of the physical stock with system records as evidenced by the majority agreement of lower stock variances and better batch and expiry date tracking.

The findings indicate that the ERP systems have reduced the number of data entry errors that are done manually with 45 % of the respondents agreeing and 30 % strongly agreeing. This means that manual-based inventory management has been replaced by automated management which has decreased human error and enhanced reliability of data.

However, the existence of a neutral response and a low percentage of dissenting responses indicate that not every staff makes the most use of the ERP system and receives equal benefit. This suggests a need for ongoing capacity building and targeted training programs so all staff members can effectively use all ERP facilities for inventory management. On the whole, the ERP integration has greatly enhanced the JMS inventory accuracy and efficiency in the operations. Overall, ERP integration has significantly improved inventory accuracy and operational efficiency at JMS.

4.2.2 Objective Two: ERP Automation and Order Fulfillment

S/N	Influence of ERP Automation on Order Fulfillment at JMS	SA		A		N		D		SD	
		F	%	F	%	F	%	F	%	F	%
1	ERP automation improves order processing speed	15	37.5	16	40	5	12.5	2	5	2	5
2	ERP automation reduces order processing errors	11	27.5	21	52.5	4	10	0	0	4	10
3	ERP improves timely delivery of orders	16	40	18	45	4	10	0	0	2	5
4	ERP automation improves warehouse picking efficiency	13	32.5	11	27.5	7	17.5	0	0	4	10
5	ERP improves coordination between warehouse and distribution	18	45	18	45	4	10	0	0	0	0
6	ERP automation improves customer order fulfillment performance	15	37.5	16	40	7	17.5	2	5	0	0



The results show that the automation process brought about by ERP has greatly enhanced the speed of order fulfillment at JMS. This implies that the employees have less workload in manual operations like entry of orders, picking, packing and dispatching of orders. 77.5% of the respondents (40% agree and 37.5% strongly agree) stated that ERP automation enhances speed in order processing. similarly, 80 %t (52.5 % agree and 27.5% strongly agree) affirmed that ERP minimizes order processing errors which shows enhanced accuracy in its operations.

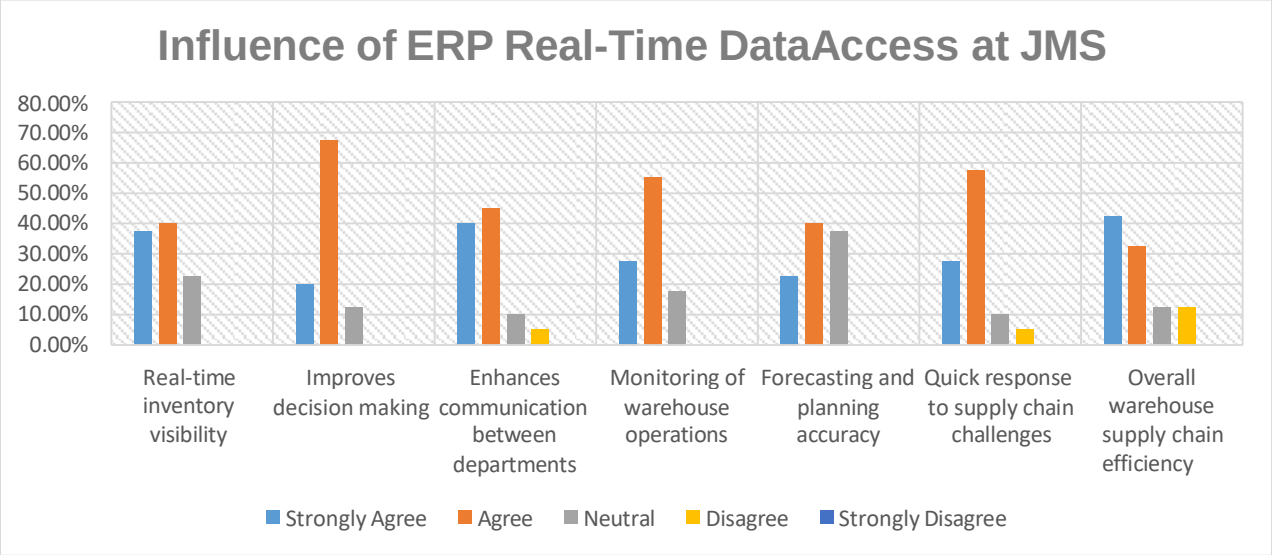
A majority of the respondents (85% agreed and 40% strongly agreed) said that ERP enhances the coordination among warehouse and distribution units, indicating great cooperation of departmental integration. On the area of delivery performance, the majority of 85% (45% agree and 40% strongly agree) also attested that ERP enhances timely delivery of orders. Also, 60% of respondents (27.5 percent agree and 32.5 percent strongly agree) mentioned increased efficiency in picking in the warehouses, and 27.5 % of them were neutral or disagreed, which indicates that some areas of operations were not fully implemented.

In general, the evidence demonstrates that ERP automation has a high positive impact on order fulfillment, yet the fact that some neutral answers were also found means that there are certain manual procedures in place.

4.2.3 Objective Three: ERP Real Time Data Access

	Influence of ERP Real-Time Data Access at JMS	**SA**		**A**		**N**		**D**		**SD**	
		F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
1	ERP provides real-time visibility of inventory levels	15	37.5	16	40	9	22.5	0	0	0	0
2	ERP improves decision making through real-time information	8	20	27	67.5	5	12.5	0	0	0	0
3	ERP enhances communication between departments	16	40	18	45	4	10	2	5	0	0
4	ERP improves monitoring of warehouse operations	11	27.5	22	55	7	17.5	0	0	0	0
5	ERP improves forecasting and planning	9	22.5	16	40	15	37.5	0	0	0	0

	Influence of ERP Real-Time Data Access at JMS	SA		A		N		D		SD	
		F	%	F	%	F	%	F	%	F	%
	accuracy										
6	ERP enables quick response to supply chain challenges	11	27.5	23	57.5	4	10	2	5	0	0
7	ERP improves overall warehouse supply chain efficiency	17	42.5	13	32.5	5	12.5	5	12.5	0	0



The results show that the real-time access to data facilitated by ERP plays a significant role in cost reduction at JMS. The findings indicate that 77.5 % of the respondents (40% agree and 37.5 strongly agree) affirmed that ERP gives them real-time view of inventory levels. Similarly, 87.5% (67.5% agree and 20% strongly agree) responded that ERP enhances decision-making by real-time information, and this shows that there is an extensive reliance on system data by managers. 85% (45% agree and 40% strongly agree) of the respondents agreed that ERP improves interdepartmental communication, and 82.5% (55% agree and 27.5% strongly agree) had to agree that it has been able to monitor warehouse operations more effectively.

Furthermore, 62.5% (40% agree and 22.5% strongly agree) agreed that ERP improves forecasting and planning accuracy, although 37.5% remained neutral, indicating some

limitations in analytical usage of system outputs. Finally, 85% (57.5% agree and 27.5% strongly agree) stated that ERP allows rapid response to supply chain issues.

Lastly, 75% (32.5% agree and 42.5% strongly agree) that ERP enhances overall warehouse supply chain efficiency, with 12.5% disagreeing, showing there was a small amount of resistance or system usability issues.

While having real-time information through ERP is clearly valuable to improve costs and efficiency, the neutral responses suggest that some employees do not fully use their analytical skills or system. Hence, it is important to conduct regular training and introduce better user support systems to realize cost-savings.

CHAPTER FIVE

DISCUSSION, SUMMARY, RECOMMENDATIONS AND CONCLUSION OF FINDINGS

5.0 Introduction

This chapter discusses the summary, recommendations and conclusion of the study on Impact of ERP Systems in Improving the Pharmaceutical Warehouse Supply Chain Efficiency at Joint Medical Store (JMS).

5.1 Discussion of Findings

5.1.1 To evaluate how ERP system integration influences inventory accuracy in pharmaceutical warehouses at JMS

It is found that 72% (34% strongly agreed and 38% agreed) of the respondents agreed that ERP integration provides real-time inventory updates. This indicates that ERP systems play a crucial role in providing timely inventory updates at JMS warehouses.

This finding supports the work of Monk and Wagner (2013), who claimed that ERP systems enable real-time inventory updates, enhancing stock visibility and eliminating time lags in inventory information. Likewise, O'Leary (2015) highlighted real-time features of ERP systems improve responsiveness and decision-making in the warehouse. The study's findings and literature are consistent, which implies that ERP at JMS is enhancing inventory visibility. However, the neutral responses indicate real-time data is not fully used in some departments. Therefore, JMS management should work on system integration and leverage the real-time tracking in the ERP system.

The findings show that 69% (31% strongly agreed and 38% agreed) of the respondents indicated that ERP systems decrease stock and system inconsistencies, 21% neutral and 10% disagreed. This indicates that ERP integration improves reconciliation. These findings are supported by Laudon and Laudon (2020), which reported that ERP systems reduce inconsistencies between stock and book through integration of stock warehouse. Similarly, Kumar & Hillegersberg (2000) found that data consistency is improved by ERP's integrated database. The inconsistency in the findings shows that there are still inconsistencies due to human error or lack of ERP adoption. Therefore, JMS should audit the system and add data validation rules.

Similarly, the results indicated that 74% of the respondents (36% strongly agreed and 38% agreed) that ERP improves accuracy in receiving and issuing stock. This is in line with Davenport (1998) who noted that ERP improves the accuracy of transaction processing and stock movements. Similarly, Umble, Haft, and Umble (2003) suggested ERP systems reduce stock receipts and issues errors. The high level of agreement indicates ERP has improved JMS' stock processes. And the indifferent answers reveal some inconsistencies. Therefore, JMS' management should redesign training and standard operating procedures for their staff to enhance ERP operations.

This study showed that 33% strongly agreed and 38% agreed that ERP decreases data entry error. This is consistent with Nah and Delgado (2006) who noted that ERP automation reduces errors. Similarly, Somers and Nelson (2001) stated that ERP decreases error by automating data entry. But 14% of respondents were neutral. Therefore, JMS should increase more automated technologies such as barcode scanning to prevent errors. Also, the study discovered 76% (39% strongly agreed and 37% agreed) of respondents agreed that ERP improves visibility of the batch numbers and expiry dates while 14% were neutral and 10% disagreed. This is crucial in the pharmaceutical supply chain. This finding is in line with Gunasekaran and Ngai (2004) who emphasised that ERP enhances traceability in pharmaceutical warehouses. Similarly, Christopher (2016) said traceability eliminates risk of expired drugs. The high agreement suggests JMS has improved pharmaceutical compliance. But the neutral answers imply betterment. Thus JMS requires better alerts and dashboards for expiry monitoring.

Finally, this study found 78% (40% strongly agreed and 38% agreed) believed ERP helps monitoring overall inventory, 12% were neutral and 10% disagreed. This shows ERP contributes to greater inventory efficiency. This finding is consistent with Chopra and Meindl (2019) who found ERP improves monitoring and visibility of inventory. The strong agreement means ERP is successful at JMS. But disagreement indicates operational issues. Therefore, JMS needs to improve ERP integration and monitor ERP.

5.1.2 To assess the impact of ERP automation on order processing time at Joint Medical Store (JMS)

Operational efficiency has been enhanced through order entry and approval at JMS where 75% (37% strongly agreed and 38% agreed) of the respondents agreed that ERP automation helps in faster order processing. it also aligns with Thomas H. Davenport (1998), who observed that ERP systems automate routine operational processes, which in turn achieves faster order processing.

Similarly, Elisabeth J. Umble, Randy R. Haft and Michael M. Umble (2003) stated that ERP automation improves order management efficiency by eliminating redundant administrative work. The high levels of agreement indicate that JMS has gained from the automation of order processing via ERP. However, neutral responses suggest that departments may need some manual approvals and/or semi-automated processes. Therefore, JMS should enhance complete automation of approval and integration of ERP modules, to reduce the processing time.

This suggested that most of the respondents agreed that automation through ERP improves coordination between processes but 18% were neutral and 10% disagreed. This implies that ERP has improved coordination of warehouse, procurement and distribution. This finding is consistent with the work of Ellen Monk and Bret Wagner (2013) that noted ERP integrates business processes and coordinates processes. Also, Kenneth C. Laudon and Jane P. Laudon (2020) noted ERP improves communication and coordination between departments, which in turn leads to faster service. However, the moderate responses demonstrate coordination problems. Therefore, JMS should consider enhancing the integration of ERP across departments and communication protocols.

The strong agreement indicates that JMS has improved its warehouse operations with ERP. But the neutral responses indicate that automation technologies, such as barcode scanning, might not be widely used. This indicates that ERP has improved warehouse efficiency. This is consistent with A. Gunasekaran and E. W. T. Ngai (2004), who noted that ERP systems enhance warehouse picking accuracy and efficiency. Likewise, Martin Christopher (2016) observed that automation with ERP enhances picking accuracy and decreases order processing time. As such, JMS should improve warehouse automation tools to improve picking and packing efficiency.

This study found that 71% of respondents (33% strongly agreed and 38% agreed) agreed that ERP improves dispatch operations, 19% were neutral, and 10% disagreed. This indicates the ERP systems have helped improve dispatch scheduling and coordination. This finding is in line with Sunil Chopra and Peter Meindl (2019), who stressed that ERP enhances dispatch scheduling and transportation operations. Also, T. M. Somers and K. Nelson (2001) found that ERP systems improve dispatch coordination. But, the neutral ratings show that dispatch might be delayed at times. Hence, JMS should enhance integration of transport planning in an ERP system.

Furthermore, the results revealed that 76% of respondents (38% strongly agreed and 38% agreed) agreed that ERP enhances order tracking. This indicates that ERP has improved order tracking and monitoring from processing through to delivery. This is consistent with Daniel E. O'Leary (2015) who noted that ERP improves order tracking within supply chains. Superior tracking and monitoring of supply chain activities is also highlighted by K. Kumar and J. van Hillegersberg (2000) using ERP. But the neutral responses indicate tracking features may not be used optimally. Thus, JMS should improve monitoring and reporting features (dashboard).

A majority of respondents (70-78%) agreed that ERP enhances communication between the warehouse and distribution units, reduces order fulfillment errors, and improves order fulfillment efficiency. These responses confirm the claims of Fiona Fui Hoon Nah and Sergio Delgado (2006) that ERP enhances communication between units. Likewise, Brandon Jones (2014) argued that better communication improves supply chain responsiveness, while Thomas H. Davenport (1998) and Elisabeth J. Umble et al. (2003) noted that ERP improves operational efficiency by eliminating errors. The high agreement shows that ERP automation has enhanced order fulfillment efficiency at JMS. But the neutral responses indicate that there is still work to be done. Consequently, JMS must pursue further improvements in ERP automation, training and integration with processes.

5.1.3 Impact of ERP-Enabled Real-Time Data Access on Cost Reduction at JMS

This research has established that ERP systems have improved cost reporting and monitoring in the pharmaceutical warehouse at JMS. The results of this study is consistent with Davenport (1998) that ERP provides real-time operational and financial information that supports cost management and decision making. But the neutral responses mean that some units might not be using the cost monitoring features in the ERP system, which suggest a need to enhance system adoption in all units.

This study found 76% of respondents agreed ERP systems reduce waste. This is an important aspect in pharmaceutical supply chains that deal with expiry dates. This is in line with Christopher (2016) who explained that ERP systems enhance expiry management and reduce losses. The findings indicate that ERP has helped JMS to reduce expirations, but it needs to improve expiry alerts.

The results indicated the highest agreement that ERP enhances inventory planning. This indicates real-time information improve forecasting and inventory planning. This result is in

line with Chopra and Meindl (2019), who noted that ERP systems help in forecasting and inventory planning. But the neutral responses suggest forecasting within the ERP system is still not optimized.

The findings are consistent with Monk and Wagner (2013) who found that ERP systems decrease emergency procurement with improved stock control. But some emergency procurement still happens, suggesting that the reorder system should be improved.

The study found that 73% of the respondents agreed (35% strongly agreed and 38% agreed) with the statement that ERP systems help to make financial decisions, while 17% were undecided (Neutral) and 10% disagreed. This indicates that, at JMS, ERP system real-time data is used to inform financial management. The results support O'Leary (2015), who highlighted that ERP systems improve financial planning and decision-making by integrating data. But neutral responses indicate that there is room for improvement in financial reporting using the system.

The research shows that ERP systems improve financial planning by increasing the budgeting and forecasting accuracy. These results confirm the claim of Nah and Delgado (2006) that ERP enhances budgeting processes. However, the presence of neutral responses indicates that the ERP budgeting modules need to be further enhanced.

Finally, the results showed that 69% of the respondents agreed (31% strongly agreed and 38% agreed) that ERP minimizes operational inefficiencies and wastage, 21% were neutral and 10% disagreed. This implies that ERP systems help to control operational costs by reducing inefficiencies in warehouses. This is in line with Davenport (1998) and Christopher (2016), who highlighted the importance of ERP in minimizing waste and inefficiencies. However, the neutral responses indicate that there are still inefficiencies and so there is a need for constant system improvement and user training.

5.2 Summary of Findings

The findings under objective one examined the effect of the integration of ERP system on inventory accuracy at JMS. These showed the majority of the respondents reported an improvement in the inventory accuracy after the ERP system was implemented. Specifically, respondents indicated that ERP system enables real-time updating of inventory records, reduces the variance between system and physical stock, improves stock receipts and issues accuracy and eliminates errors in manual data entry. There is also better visibility in batch numbers and expiry

dates and improved stock monitoring. But a small number (10% disagree and 12-19% neutral) of respondents indicate potential problems in using and adopting the system. Overall, the results show that ERP integration has improved stock visibility and accuracy at JMS.

The findings for objective two show the effect of automation on order processing time at JMS. The results indicate that the majority of respondents agreed that ERP automation helps to shorten order processing time and coordinate processes, as well as improve picking, packing and dispatching. They also reported improved order tracking, communication, reduced order errors and improved order processing. However, 10% disagreed and 14-20% were neutral suggesting that automation through ERP is not necessarily efficient in all areas.

The results for objective three focused on the effects of real-time data access through ERP on cost reduction at JMS. This found that the majority of respondents agreed that ERP enables better cost monitoring, reduces costs associated with inventory expiry, improves inventory planning and reduces costs associated with emergency procurement. They also reported better cost monitoring, financial decision-making, budget planning, operational efficiency, and overall cost control. But 10% of respondents disagreed and 13-21% were neutral, suggesting that not all departments have achieved cost savings. In essence, real-time data access using ERP systems plays a vital role in promoting cost reduction and enhancing financial control at JMS.

5.3 Recommendations

- Firstly, Joint Medical Store (JMS) enhances ERP system integration with all warehouse and supply chain operations to improve inventory control through continuous staff training on ERP modules such as inventory control, batch tracking and expiry monitoring.
- Second, JMS should increase automation of order fulfillment using ERP system to increase efficiency. The results revealed that although ERP speeds up order processing, some tasks are only partially automated. So JMS should enhance automation technologies such as bar code scanning, automatic picking and integrated shipping planning to minimize delays and errors even further.
- JMS should improve inter-departmental ERP system usage and monitor and review system performance. This will foster communication and ensure uniform use of the system across the departments, and identify operational inefficiency in inventory, order fulfilment and cost management for immediate corrective action.

5.4 Conclusion

The research found ERP systems boost pharmaceutical warehouse supply chain efficiency at Joint Medical Store. The study found ERP system integration enhances inventory accuracy by updating data in real time, eliminating stock errors and enabling better stock management. Further, the automation provided by ERP systems improves order processing time by streamlining workflows, reducing processing times, and operational errors. ERP-driven real-time data monitoring helps reduce costs through better financial decision making, minimized stock expiry, and improved stock planning. Although the benefits are positive, moderate neutrality and slight disagreement in the findings suggests that the benefits of ERP are yet to be maximized. So enhancing system integration, employee training and automation systems will further improve the effectiveness of ERP systems and improve supply chain efficiency at JMS.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

Study Title: Impact of ERP Systems in Enhancing Pharmaceutical Warehouse Supply Chain Efficiency at Joint Medical Store (JMS)

Dear Respondent,

My name is **SIFA UYERHIU,** pursuing a BACHELORS IN PROCUREMENT AND LOGISTICS MANAGAEMENT **M23B12/122** from Uganda Christian University Mukono. You have been selected as one of the respondents in this research as I am investigating **THE IMPACT OF ERP SYSTEMS IN ENHANCING PHARMACEUTICAL WAREHOUSE SUPPLY CHAIN EFFICIENCY.** All responses given should be genuine so as we come up with accurate data.

INSTRUCTIONS

Tick and fill in where necessary.

SECTION A: DEMOGRAPHIC INFORMATION

1. Gender

a) Male ☐
b) Female ☐

2. Age bracket (years)

a) 18-24 ☐
b) 25-34 ☐
c) 35-44 ☐
d) 55 and above ☐

3. Academic qualifications

a) Diploma ☐
b) Certificate
c) Master's degree ☐
d) Bachelor's degree ☐
e) Certificate / diploma ☐
f) Others ☐

5. Category of respondents

a) Warehouse Management Staff ☐
b) Procurement Staff ☐
c) IT/ERP System ☐
d) Logistics & Distribution ☐

6. Work Experience at JMS?

a) Less than a year ☐
b) 1-3 years ☐
c) 4-6 years ☐

d) Above 6 years ☐

SECTION B: How does ERP system integration affect inventory accuracy in pharmaceutical warehouses at JMS? (Tick as Appropriate)

Indicate the extent to which you agree with the following observations on how does ERP system integration affect inventory accuracy in pharmaceutical warehouses at JMS on a scale of (1) = strongly disagree, (2) = disagree, (3) = not sure (4) = agree (5) = strongly agree.

	5	**4**	**3**	**2**	**1**
ERP system integration enables real-time updating of inventory records in pharmaceutical warehouses at JMS.					
ERP system integration reduces inventory discrepancies between physical stock and system records at JMS.					
Integrated ERP systems improve accuracy in recording stock receipts and issues at JMS warehouses.					
ERP system integration minimizes manual data entry errors in inventory management at JMS.					
ERP system integration improves visibility of batch numbers and expiry dates in pharmaceutical inventory.					
ERP system integration reduces cases of stock-outs and overstocking in JMS pharmaceutical warehouses.					

SECTION C: What is the effect of ERP-driven process automation on order fulfillment speed at JMS? (Tick as Appropriate)

Indicate the extent to which you agree with the following observations on what is the effect of ERP-driven process automation on order fulfillment speed at JMS using a scale of (1) = strongly disagree, (2) = disagree, (3) = not sure (4) = agree (5) = strongly agree.

Scale	**5**	**4**	**3**	**2**	**1**
Automated ERP processes reduce the time required to process customer orders at JMS.					
Order fulfillment activities at JMS are faster due to automated ERP workflows.					
Automation within the ERP system improves coordination between sales, warehousing, and distribution.					
Picking, packing, and dispatch operations are completed faster using ERP automation at JMS.					
Real-time order tracking through the ERP system improves order fulfillment speed.					

ERP automation reduces bottlenecks and order backlogs in JMS operations.					
Automated ERP systems support better scheduling and planning of order fulfillment activities.					

SECTION D: How does ERP-enabled real-time data access influence cost reduction in pharmaceutical warehouse operations at JMS? (Tick as Appropriate)

Indicate the extent to which you agree with the following observations on how does ERP-enabled real-time data access influence cost reduction in pharmaceutical warehouse operations at JMS on a scale of (1) = strongly disagree, (2) = disagree, (3) = not sure (4) = agree (5) = strongly agree.

Scale	**5**	**4**	**3**	**2**	**1**
Real-time access to inventory data through the ERP system helps reduce operational costs at JMS.					
Access to real-time data reduces losses caused by expired or damaged pharmaceutical products.					
Improved visibility of stock levels through ERP systems reduces overstocking and associated costs.					
Timely availability of data through the ERP system minimizes emergency procurement costs.					
Access to real-time information improves decision-making related to cost-saving measures at JMS.					
Real-time ERP data supports efficient labor utilization in warehouse operations.					

APPENDIX 2 INTRODUCTORY LETTER

UGANDA CHRISTIAN UNIVERSITY
A Centre of Excellence in the Heart of Africa

School of Business

26th 02 2026

Dear Sir/Madam

Re: Introduction of Sifa Uyergiu, M23B12/122 for Data Collection Permission

I am writing to introduce **Ms.Sifa Uyergiu, M23B12/122** , a student of Bachelor's Degree in Procurement and Logistics Management at Uganda Christian University. **Sifa Uyergiu, M23B12/122**, is currently in the advanced stage of her academic journey and is conducting a dissertation on **"IMPACT OF ENTERPRISE RESOURCE PLANNING SYSTEM IN ENHANCING SUPPLY CHAIN EFFICIENCY."**

I assure you that **Ms.Sifa Uyergiu, M23B12/122,** will adhere to all ethical guidelines and treat any data collected with the utmost confidentiality. She is a responsible student dedicated to conducting a thorough and rigorous study.

We kindly request your support in granting **Ms.Sifa Uyergiu, M23B12/122** access to relevant data and personnel within any department and as well as any personnel with objective knowledge regarding her topic. Your valuable insights will significantly contribute to the success and quality of her research.

Thank you for considering her request. Should you require any additional information, please do not hesitate to contact me on the address provided here below.

Sincerely,

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Mukisa Simon Peter
Lecturer and undergraduate
Research coordinator UCU School of Business
Email smukisa@ucu.ac.ug Mob. 0752038600

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