



An investigation into the influence of information technology on the performance and quality of distribution centers in Gaborone

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Abstract

This study examines the impact of information technology (IT) on the performance of distribution centers. It explores how IT influences these centers, identifies stakeholders affected by inefficient technology use, and suggests measures to mitigate such impacts. Using a quantitative method, data was collected from 35 questionnaires, achieving a 70% response rate. The study highlights challenges in IT infrastructure within the expanding transportation and shipping sectors, leading to inefficient resource utilization. However, IT fosters advancements, particularly in inventory management, which remains challenging in warehouses without digital systems. Findings reveal that IT significantly enhances management system capabilities, improving company performance by reducing product lead times, offering competitive pricing, and increasing customer satisfaction. Recommendations are provided for distribution centers in Gaborone, such as CA Sales Distribution and Fours Distribution, urging them to prioritize IT dimensions. The study aims to contribute both theoretically and practically to stakeholders, helping them enhance supply chain efficiency, minimize costs, reduce lead times, and decrease inventory wastage. Managers gain insights into strategies to optimize IT utilization and resolve bottlenecks, while customers become more informed about IT's significance. The research also lays the foundation for future investigations into gaps between IT and performance and emphasizes the government's role in aiding private companies to adapt to new technologies.

Keywords: Supply chain; Performance; Distribution centers; Information technology

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1. Introduction

The realm of transportation and logistics is an ever-evolving landscape, continually enhancing the accessibility of goods and services for consumers and the general public. As developed nations forge ahead with rapid technological advancements, developing nations, as noted by Varian et al. (2012), strive to bridge the gap by intensifying business competition to bolster their respective economies. Distribution centers, at the forefront of handling daily trends in goods, consider information technology a pivotal force influencing their operational efficacy as they strive to meet client expectations and attain predefined financial objectives. Numerous studies have been conducted to delve into this intersection of technology and logistics.

Pelonomi's work (2014) emphasizes the importance of trade and investment, highlighting that technology is a prerequisite for expanding capabilities in effective technological diffusion. This expansion aims to align with high Botswana literacy levels, particularly in urban hubs like Gaborone, where facilities are most prevalent. The goal is to establish prominent brand names associated with quality goods and services, thereby contributing to the economic growth of Botswana through increased profits and competitive advantage.

Perego et al. (2011) underscore the critical role of advanced information technology in transforming enterprises. By enabling computer systems to retrieve manually planned and implemented raw data or knowledge, technology becomes an invaluable reference for current and future decision-making. The integration of automated systems, driven by advancements like Moore's Law (1965), not only enhances efficiency but also aligns with the constant evolution of technology. Moore's Law posits that the relentless progress in technology corresponds to increased processing speed, leading to time savings and heightened productivity as data is electronically processed and managed. The synergy of Moore's Law, the internet, digital awareness, and financial markets sparks an era of rapid innovation and consolidation, as evidenced by research conducted by Varian et al. (2012).

Despite the high literacy levels and urban prevalence of facilities in Gaborone, the absence of technology inhibits organizations from realizing their full competitive potential in logistics. The primary challenges include inadequate infrastructure supporting technology, resistance and inability of employees to adapt to technological changes, limited capital for investing in technological facilities and systems, and a shortage of skilled labor to operate these technologies. This study seeks to delve into these challenges, examining their impact on the efficiency of supply chain operations in Gaborone's urban center and proposing strategies for improvement.

1.1. Problem statement

Due to challenges in its information technology infrastructure stemming from the rapid growth of industries, the supply chain's operational pace has significantly slowed due to inefficient information technology utilization. This has led to unpredictable delivery schedules, heightened costs, diminished product quality, and compromised safety, resulting in dissatisfaction among supply chain stakeholders. Ineffectual computer system utilization and suboptimal strategic metrics contribute to logistics and transportation management delays, negatively impacting customers with inaccurate and misinterpreted information, leading to inconsistent services. Inventory management, encompassing the handling of goods from reception to storage and outbound shipping, becomes particularly intricate in warehouses with low turnover rates, exacerbated by

the absence of a digital system. Consequently, this study aims to investigate the influence of information technology on the efficiency of distribution centers in Gaborone.

1.2. Purpose of the study

The aim of this study is to underscore the significance of treating information with utmost importance, emphasizing its pivotal role in bridging temporal and spatial gaps. Recognizing the importance of information is crucial for ensuring timely and precise deliveries of high-quality products to customers, ultimately enhancing the overall efficiency of the supply chain. By delving into this investigation, businesses in Gaborone can position themselves competitively in the dynamic commercial landscape, striving to generate profits, build compelling brands, and appeal to discerning consumers and investors.

The insights derived from this study can guide managers in steering clear of errors that hindered previous distribution centers, enabling businesses to minimize risks and achieve heightened performance. Additionally, the outcomes of this research offer valuable contributions to future scholars by laying the groundwork for further exploration in this domain. The findings may serve as a reservoir of knowledge, facilitating deeper understanding and analysis. Lastly, this study holds relevance for the government and organizational entities, providing insights to fine-tune their strategies in response to the demands of the public sector supply chain and its clientele. In fostering awareness and understanding among the people of Botswana, this research encourages an open dialogue where concerns and perspectives on the subject can be expressed and addressed.

1.3. Main objectives of the study

The main objective of this study is to identify and propose the influence of information technology on the performance of distribution centers in Gaborone.

1.4. Specific objectives

- To identify stakeholders who are affected by inefficient usage of technology on distribution centers in Gaborone.
- To determine measures that can be undertaken to reduce the impact of information technology on performance of distribution centers in Gaborone.
- To establish the importance of information technology on performance of distribution centers in Gaborone

1.5. Research questions

- What factors contribute to the inefficiency or suboptimal utilization of information systems, impacting the performance of distribution centers in Gaborone?
- How do the consequences of inefficient information technology manifest in the overall performance of distribution centers in Gaborone, and what specific areas are most affected?
- What actionable recommendations can be proposed to enhance and optimize information technology within distribution centers in Gaborone, aiming to improve efficiency and overall performance?

- To what extent does the integration of emerging technologies influence the performance and quality of distribution centers in Gaborone?

2. Literature review

The aim of this section is to analyze existing literature on the efficiency of distribution centers and identify potential solutions. A comprehensive review of relevant studies was conducted to explore the relationships between distribution centers and information technology, while also addressing knowledge gaps in the field.

Sweis et al. (2018) emphasize that distribution centers play a crucial role in providing the infrastructure and technology necessary for online retailers to offer cost-effective, accurate, and prompt shipments. Modern electronic technology is employed in these centers for equipment monitoring and overseeing employee activity and production. The literature underscores the growing significance of information systems within organizations due to technological and trade globalization. Goodhue and Thompson (2006) assert that for an information system to positively impact performance, it must be appropriately utilized and aligned with the tasks it supports. Operational efficiency in distribution centers, as highlighted by Hou (2010), can significantly impact corporate operations, with effective storage management contributing to increased performance.

Refusal to adopt technology in distribution centers can lead to customer dissatisfaction and decreased profits. Mansell and When (1998) argue that quality can be enhanced through the streamlining of designs, layouts, and processes, emphasizing the importance of effective training for supply chain stakeholders to comprehend information technology.

Riste and Tamara (2019) stress the necessity of advanced technologies such as robotic material handling, order fulfillment systems, multi-level storage handling, and voice picking systems to handle high-level skills in production, distribution, and consumption integration processes. Tracking and monitoring tools like GPS, radio frequency identification, real-time location systems, and data loggers are deemed essential for the efficient movement of goods within the supply chain. The literature review thus provides a comprehensive overview of the current understanding of the intricate relationship between information technology and the performance of distribution centers.

Varma and Khan (2014) emphasize the necessity for organizations to effectively manage their supply chains in response to increased global competition, accelerated time-to-market demands, and the process of internationalization. They underscore the pivotal role of information technology in this digital transition, portraying it as a critical element providing visual and auditory information for informed decision-making. Reichstein (2019) elucidates that supply chain management encompasses the planning and orchestration of activities related to supply, information acquisition, management, logistics, and financial transactions within and between businesses. The ultimate goal is to elevate processes and functions to a high level of performance, reflecting the interconnected nature of these components. Masudin et al. (2020) delves into the impact of adopting a warehouse management system on business performance and the competitive advantage of regional distribution centers. Through a case study, the author reveals that the implementation of such a system positively affects operational efficiency, reducing costs and enhancing strategic competitiveness. The study suggests that distribution centers, especially in the automotive sector, can effectively compete by upgrading their warehouse systems.

Examining the role of RFID adoption, Chang (2011) identifies two key perspectives for improved performance: profit and customer satisfaction. The study finds that the application of RFID technology can boost sales, contributing to increased organizational profit. Furthermore, the reduction of inventory carrying costs is highlighted as a potential advantage for organizations adopting RFID.

Despite the exponential growth in information technology usage over the past two decades, ethical considerations in this domain have not progressed at a commensurate rate. This ethical lag is outlined by acknowledging a bias in the information literature towards issues involving powerful groups, such as software theft, system failures, and the moral choices of IT workers. A call is made for a comprehensive map that guides researchers, students, and practitioners in addressing ethical challenges related to information technology, emphasizing the need to address management and organizational ethical choices in addition to individual perspectives

3. Methodology

This chapter outlines the research strategy adopted to address the research questions, along with the methods and techniques chosen for data collection and analysis to achieve the research objectives. The researcher conducted data collection in Gaborone, focusing on various distribution centers including Fours Distribution Center and CA Sales Distribution Center, as well as the Department of Transport and Logistics due to its involvement in inventory management on a large scale.

Utilizing scientific measurement techniques, the researcher investigated distribution centers, aiming to elucidate causative factors and effects underlying specific impacts and actions. The research sought to provide explanations and predictions while being empirically observable through human senses. Quantitative research methods were employed, utilizing numerically structured data or data readily convertible into numerical form. Statistical tools such as tables, pie charts, bar graphs, or histograms were utilized to present the quantitative analysis findings.

For this study, descriptive research was deemed the most suitable approach to examine how information technology influences distribution center performance, allowing for a comprehensive understanding of underlying meanings and characteristics (Nassaji, 2015). The research employed a probability sampling technique, ensuring that each member of the community had an equal chance of selection.

A questionnaire served as the primary instrument for data collection, facilitating respondents to express information in their own words. The questionnaire comprised five sections:

- Section A focused on gathering demographic information using Likert scale questions, including gender, age, work experience, and educational qualifications.
- Section B solicited information on the influence of information technology on distribution center performance in Gaborone.
- Section C targeted stakeholders affected by inefficient technology usage in distribution centers.
- Section D aimed to gather insights into measures that could mitigate the impact of information technology on distribution center performance.

- Section E explored the importance of information technology on distribution center performance in Gaborone.

3.1. Choice of sampling and data collection methods

The study employs a probability sampling technique, specifically chosen to ensure that every member of the population has a known and equal chance of being selected. This approach aligns well with the study's aim to gather a representative sample, which is crucial for making generalizations about the larger population of distribution centers in Gaborone. The random selection process helps minimize selection bias and enhances the external validity of the study's findings.

Probability sampling is particularly suitable for this study because it allows for:

- **Generalizability:** The findings from the sample can be confidently extrapolated to the entire population of distribution centers in Gaborone.
- **Objectivity:** Random selection reduces the risk of researcher bias in the sample selection process.
- **Reliability:** The technique supports the reproducibility of the study, enabling future researchers to replicate the sampling process and verify the results.

In this study, a simple random sampling method was employed, where each distribution center in Gaborone was assigned a number. A random number generator was then used to select the sample. This method ensures that each distribution center had an equal probability of being included in the sample, thus supporting the study's goal of achieving a comprehensive understanding of the impact of information technology on their performance.

3.2. Limitations of probability sampling in this context

While probability sampling offers significant advantages, it is essential to acknowledge its limitations within the context of this study:

- **Resource Intensive:** The process of obtaining a complete list of all distribution centers in Gaborone and conducting random sampling can be time-consuming and resource-intensive.
- **Non-response Bias:** Even with a random sample, there is a possibility of non-response bias if certain distribution centers choose not to participate or are unavailable, potentially skewing the results.
- **Complexity in Implementation:** Ensuring true randomness and dealing with logistical challenges in contacting and collecting data from the selected distribution centers can be complex.

3.3. Addressing the limitations

To mitigate these limitations, the study incorporated several strategies:

- **Increasing Response Rates:** Follow-up reminders and multiple contact attempts were made to encourage participation and reduce non-response bias.
- **Supplementary Data Collection:** In cases where random sampling faced significant challenges, supplementary data collection methods, such as purposive sampling, were used to gather additional insights while clearly distinguishing these methods in the analysis.

3.4. Population

The targeted population in this study was the transport and logistics department workers of established population to be 110 respondents of CA sales distribution center and Fours distribution center in Gaborone. The population included procurement and logistics professionals but due to the limited time, population of only 2 companies were selected for sampling.

3.5. Rationale for choosing two distribution enters

The decision to focus on only two distribution centers was strategic. These centers were selected based on their significant roles within the company's overall logistics network and their geographical distribution, which represents a microcosm of the larger target population. By selecting these centers, we aimed to capture the variability in processes and challenges that different locations might face, while maintaining a manageable scope for the study. This approach allows us to gather detailed insights and develop a deeper understanding of the factors influencing IT adoption within distribution centers, which can then be extrapolated to other centers with similar characteristics.

3.6. Data collection procedures

The researcher arranged appointments with participants and obtained permission from BA ISAGO University to commence data collection, which spanned a period of two and a half weeks. The questionnaires comprised a combination of closed-ended and open-ended questions. Employing a drop and pick technique facilitated the collection of original data from a substantial sample at a low cost per datum, resulting in a response rate exceeding 70%. Follow-up and clarification calls were made to ensure respondents comprehended the questions and to prompt timely submission of completed questionnaires. On average, participants spent between 10 and 15 minutes to complete the assessment, which unfolded over approximately four weeks.

4. Analysis of data and interpretation of results

4.1. Response rate of questionnaire

This chapter provides an overview of the research findings, data analysis, and the numerous questionnaire replies. Percentages, tables, pie charts, and bar charts were used to present the data. The percentage of respondents divided by the total sample size is the response rate questionnaire, the most common way to express it is as a percentage (%).

Questionnaire with a response rate is the number of respondents divided by the sample size.

Table 1. Response Rate of Questionnaire

Description Issued	Issued	Returned Complete	Percentage of Response Rate (%)
Number of Questionnaires	50	35	70

The researcher gave out fifty (50) questionnaires, but only thirty-five (35) of participants were able to respond, as shown in (Table 1). According to Table 1, the overall response rate was thus calculated to be 70%. Despite this, the investigation went ahead because, Babbie (2017), any response rate above 50% can be regarded as statistically sufficient overall to represent the entire population; consequently, this percentage is justifiable enough to support research. A score of more than 60% or more than 70% is also extraordinary.

4.2. Sample size and generalization limitations

It is acknowledged that the sample size of 35 returned questionnaires from 50 distributed is relatively small for drawing broad conclusions about the entire IT sector in distribution. This limitation is particularly pertinent given the dynamic nature of IT in distribution, where rapid changes and diverse operational contexts can significantly influence outcomes. As such, the findings from this study should be interpreted with caution and considered as indicative rather than definitive. Future research with larger sample sizes and a broader range of distribution centers would be beneficial to validate and expand upon these initial findings.

4.3. Demographic data

The data shown here pertains to demographic categories of people based on characteristics like gender, age, professional background, occupation, relationship, and the amount of time you have worked in Gaborone's transportation industry. These characteristics were used to the results of the questionnaire used to gather data on the impact of information technology on the efficiency of distribution centers in Gaborone when interpreting the information gathered from it.

4.4. Gender of respondents

From the figure 1 it was established that 63% of the respondents were males and Females were second with 37% from the selected distribution centers in Gaborone who were willing to provide information.

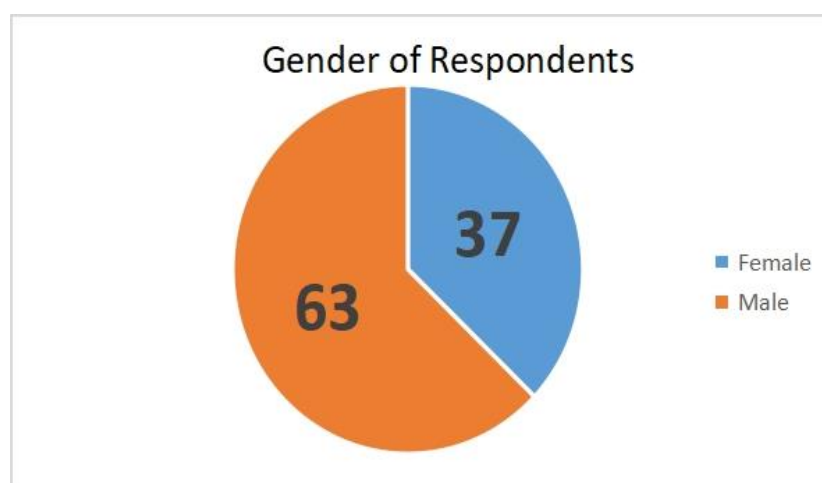


Figure 1. Gender of Respondents

The study implies that majority of the participants were males'. This could suggest that most of the employees in the logistics and procurement department among distribution centers are male. Nevertheless, since the emphasis of the study was on examining the impact of information technology on performance rather than individual perspectives, this aspect did not influence the research outcomes.

4.5. Years of experience

Participants were queried about their tenure within Gaborone's distribution centers. Results indicate that 28% of respondents reported less than one year of service, while 26% reported a tenure ranging from one to five years. Moreover, 37% reported tenure spanning six to ten years, with 9% reporting more than ten years of service. These findings are visually represented in Figure 2.

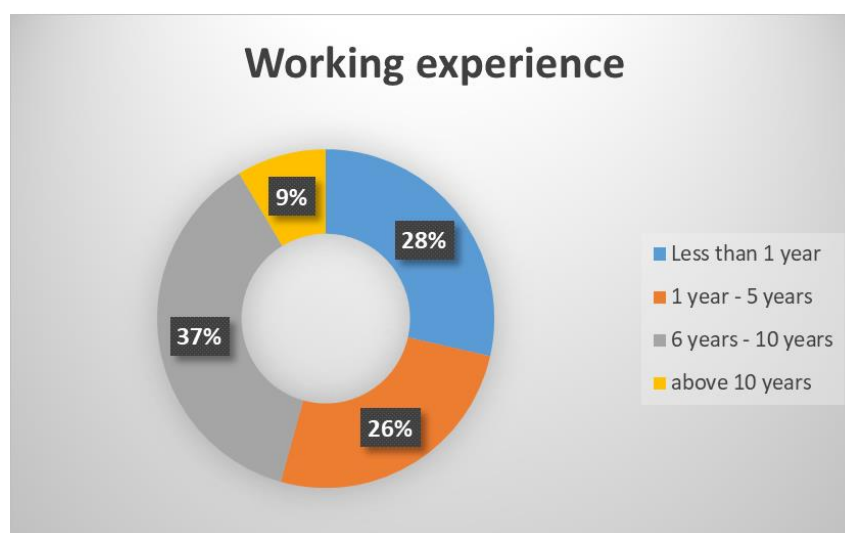


Figure 2. Years of experience

Figure 2 shows that 37% of the respondents' personnel have experience between six and ten years. According to this, the majority of the personnel included in the survey had sufficient expertise and could comprehend supply chain management. According to Banerjee and Mishra (2017), the significance of work experience lies in its ability to influence the reliability of information obtained in any study, as the duration of employment within a company plays a crucial role. As a result, the respondents chosen for the survey were in a position to give a precise picture of information technology.

4.6. Age distribution of respondents

The survey revealed that 26% of respondents fell below the age bracket of 25 years, as well as within the range of 25 to 30 years. A significant portion, 34%, belonged to the age group of 31 to 40 years. Those between 41 and 50 years constituted 9% of the respondents. The smallest proportion, 6%, comprised individuals above 51 years of age.

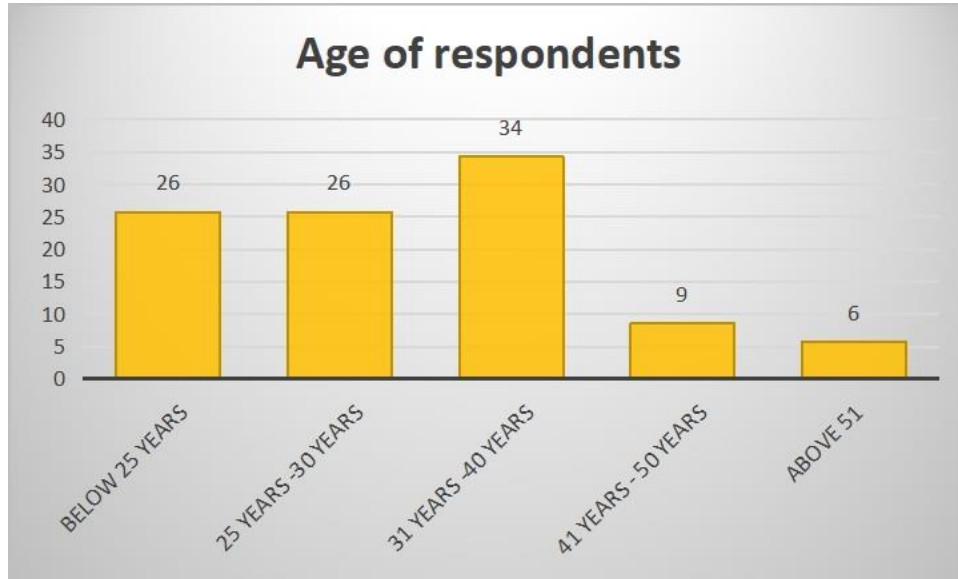


Figure 3. Age of respondents

The findings of the study revealed that 34% of the respondents were between the ages of 31 and 40, indicating that middle-aged individuals predominate in Gaborone's distribution centers. This demographic is often more economically active and concerned with organizational performance and success, as highlighted by Albright et al. (2010). The presence of a significant proportion of middle-aged employees suggests that the distribution centers have the potential for higher performance levels due to the maturity, experience, and active engagement of this age group.

The representation of adults aged 31 to 40 in the distribution centers also indicates that these individuals can provide informed opinions on the influence of information technology. Their experience and familiarity with both traditional and modern technological systems enable them to assess the impact of IT on operational efficiency and overall performance accurately. These insights align with the study's objectives, highlighting the importance of leveraging the expertise of middle-aged employees to optimize the use of information technology in distribution centers. By focusing on the active and knowledgeable segment of the workforce, distribution centers in Gaborone can better implement and utilize IT solutions to enhance productivity, communication, and collaboration. This approach underscores the critical role of demographic factors in understanding and improving the performance of distribution centers through effective information technology integration.

4.7. Educational attainment

Respondents were asked to specify their level of education. Results revealed that 14% of participants had completed secondary education, 29% held diplomas, and 46% had obtained undergraduate degrees. Additionally, 11% of respondents held master's degrees, while none possessed doctorate degrees. These findings are illustrated in Figure 4.

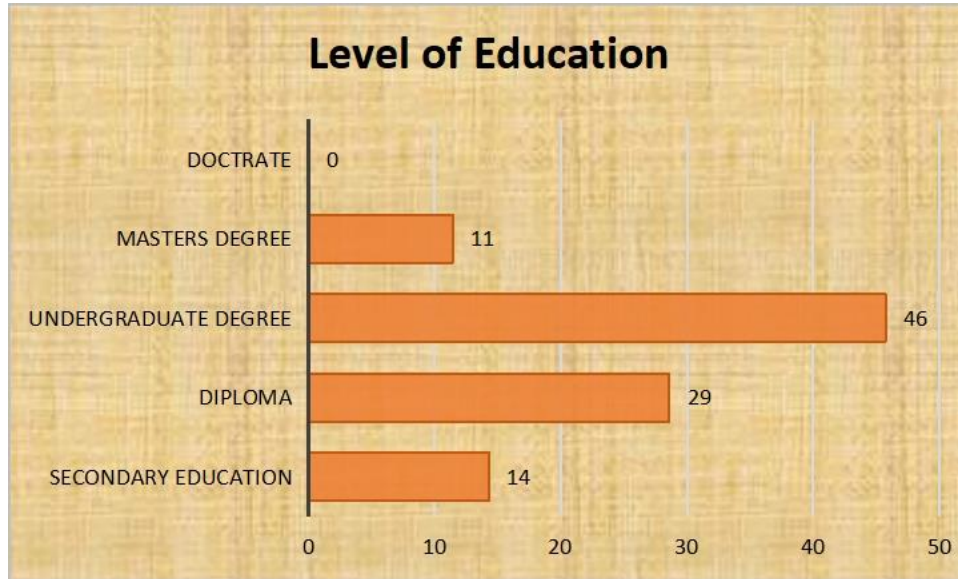


Figure 4. Level of education

The findings indicated that the majority (46%) of the respondents who participated in the study had at least an undergraduate degree, as shown in Figure 4. This suggests that the majority of the firms have the education necessary to comprehend the problems and ideas related to how distribution centers operate in relation to information technology. This also indicates a larger pool of highly educated workers within distribution centers, which is essential for maintaining competitiveness in the face of evolving market trends. It is crucial for organizations to acknowledge the significance of higher education among employees. Previous research supports the assertion that individuals with advanced education levels tend to achieve greater success due to their enhanced knowledge base and proficiency in contemporary skills.

Participants were requested to identify the predominant sources of information technology in distribution centers in Gaborone using a four-point Likert scale, where SD represents strongly disagree, D signifies disagree, NS indicates not sure, A denotes agree, and SA represents strongly agree. The Relative Importance Index (RII) was utilized for ranking these sources, which yielded values within the range of $0 < x \leq 1$. A higher RII value indicates the more frequently cited sources contributing to the prevalence of information technology in distribution centers in Gaborone. The RII was calculated using the formula:

$$RII = \Sigma W / (A * N)$$

where:

W = total score assigned to the effects by respondents

A = Highest weight

N = total number of respondents for the question.

The interpretation of these findings demonstrates the critical role of information technology in enhancing the efficiency and performance of distribution centers. The high level of education among employees facilitates better understanding and implementation of IT solutions, which, in turn, contributes to operational improvements. This highlights the importance of continuous education and training for employees to adapt to technological advancements and sustain competitive advantage in distribution centers.

4.8. Sources of information technology on distribution centres

Table 2. The influence of information Technology on the performance of distribution centers in Gaborone

	N	ΣW	(A*N)	RII	Rank
Increase productivity	35	147	175	0.84	1
Building new distribution hubs in strategic IT system planning	35	123	175	0.70	3
Distribution hubs communicate with trading partners about critical business procedures.	35	110	175	0.63	4
Improve the distribution facilities' current technology.	35	146	175	0.83	2

From Table 2, it is observed that the Relative Importance Index (RII) highlights several key influences of information technology on distribution centers. The findings indicate that increasing productivity is the most significant impact, with the highest number of respondents agreeing to its importance. This suggests that information technology plays a crucial role in enhancing productivity within distribution centers.

The second most influential factor is improving the distribution’s current technology. This high ranking demonstrates that updating and maintaining technology systems is vital for achieving predetermined productivity outcomes in distribution centers. Building new distribution hubs in strategic IT system planning is ranked third, while with less frequency than the top two factors. This indicates that while strategic planning and the establishment of new hubs are important, they are less frequently prioritized compared to direct productivity and technology improvements. Lastly, other influences were ranked the least, with minimal respondent agreement. This shows that these factors have a minor impact on the overall performance of distribution centers compared to the more highly ranked influences.

Table 3. Stakeholders affected by inefficient usage of information technology on distribution centers in Gaborone

	N	ΣW	(A*N)	RII	Rank
Competitors	35	108	175	0.62	4
Customers	35	154	175	0.88	1
Suppliers	35	146	175	0.83	2
Society	35	123	175	0.70	3

The data in Table 3 highlights the stakeholders most affected by the inefficient use of technology in distribution centers. Customers are the most impacted, ranking first. Suppliers come second, followed by society, which ranks third. Competitors are the least affected, ranking fourth. This ranking indicates that inefficiencies in technology use within distribution centers have the greatest direct impact on customers, influencing their satisfaction and experience. Suppliers are also significantly affected, likely due to disruptions in the supply chain. The broader society feels the impact to a lesser extent, potentially through economic and environmental effects. Competitors are least affected, though they may still experience some indirect consequences.

Table 4. The importance of information technology on the performance of distribution centers in Gaborone

	N	ΣW	(A*N)	RII	Rank
Business processes more efficient and effective and concentrate on their primary competencies	35	156	175	0.89	1
Centres are able to protect both their own and their clients' data safeguard.	35	107	175	0.61	4
Increasing customer confidence, reliance and global competitive penetration	35	139	175	0.79	3
Boost output and reduce the likelihood of human error	135	154	175	0.88	2

Table 5. Measures that can be undertaken to reduce the impact of inefficient usage of information technology in Distribution centers in Gaborone

	N	ΣW	(A*N)	RII	Rank
Employing Logistics outsourcing companies to execute activities	35	123	175	0.70	4
Distribution centres are to understand the attitudes and believes about new and advanced information technology	35	155	175	0.89	1
Participate actively in the creation, planning, and integration of the processes with the individuals who will use the technology so they can use it.	35	136	175	0.78	3
Make quality top priority by learning new technologies and making informed purchases.	35	141	175	0.81	2

The findings highlight the significant impact of information technology on the performance of distribution centers in Gaborone. The most crucial benefit identified is the enhancement of business process efficiency and effectiveness, allowing centers to concentrate on their primary competencies. This was followed by improvements in output and reductions in the likelihood of human error, ranked as the second most important benefit. Additionally, increasing customer confidence and reliance, as well as achieving global competitive

penetration, were ranked third. Data protection for both the centers and their clients, though still important, received the lowest ranking among the measures evaluated. These results underscore the multifaceted advantages of adopting information technology in distribution centers, emphasizing operational efficiency, customer satisfaction, and competitive positioning.

Table 5 highlights key measures to mitigate the impact of inefficient information technology in distribution centers. The top-ranked measure among respondents was understanding attitudes and beliefs about new and advanced information technology. Following closely was prioritizing quality by adopting new technologies and making informed purchases. In third place, although less commonly implemented according to its lower Relative Importance Index (RII), was active participation in the creation, planning, and integration of processes to enhance user adoption. Lastly, employing logistics outsourcing companies to execute activities was also noted as a strategy.

4.9. Discussion

The findings from this study hold significant relevance for the logistics industry. Most participants had less than 5 years of experience, while others had over 5 years, providing a diverse range of insights. The distribution manager constituted the largest group of respondents, followed by logistics planners, quality managers, and production managers, who all contributed valuable responses during data collection. Recommendations from these respondents were particularly emphasized for their potential to enhance the research findings.

Analysis of the questionnaire using Relative Importance Index (RII) revealed several impacts of inefficient information technology, including reduced productivity, decreased employee engagement, increased costs, compromised decision-making and forecasting, security vulnerabilities, slower development, and reduced competitive advantage. From the results, it can be inferred that distribution centers with appropriate and intelligent information technology have high percentages of increasing productivity because workers can work with automated machines that result in efficiency and effectiveness, producing more goods and providing more service at reduced costs while using fewer resources.

The performance of distribution centers has been found to be impacted by information technology. With the introduction of updated, if not brand-new, technology, distribution centers have been able to streamline their operations, cut costs, and increase efficiency. The capacity to automate is one of information technology's most important effects on distribution facilities. Centers have been able to decrease the time and effort needed to complete tasks, increased efficiency and productivity.

Drucker (2010), thinks that using information technology in the workplace can give businesses a competitive edge. On the same motion, Porter (2007) concurs that information technology may be used to increase productivity and efficiency. Distribution centers can use data analytics to examine data from a variety of sources, including customer orders, inventory levels, and shipping information. Trends in consumer orders can be found with the aid of these analytics. Thomas (Davenport, 2012) argues that data analytics boosts operational efficiency.

With the help of online portals and other communication technologies, distribution hubs may increase communication and collaboration with suppliers and customers by informing trading partners about crucial business procedures.

Findings, customers are the ones who suffer the most when information technology is used inefficiently since it causes delayed delivery, inaccurate orders, and subpar customer service. Customer unhappiness and business loss resulted from this. As a result of the delayed delivery, inaccurate orders, and poor communication, suppliers are also impacted, which leads to supplier unhappiness. Along with clients and vendors, shareholders are also impacted, which lowers profitability, shrinks market share, and lowers shareholder value. Additionally, employees deal with issues including growing workloads, extended working hours, and declining job satisfaction.

The government is confronted with issues like declining tax revenue, economic expansion, and worldwide market competition. By learning about new technology and making wise purchases, put quality first. Enhancing distribution facilities by spending money on new hardware and software that can increase output. This can entail deploying automated sorting systems, adopting new inventory management systems, and upgrading to quicker computers.

Engage the people who will use the technology in the development, planning, and integration of the processes so they can use it. Teaching staff members how to use modern software and technologies. This could increase productivity and assist to cut down on errors. Employees can also be taught how to troubleshoot typical IT issues, minimizing downtime and increasing productivity.(McAfee, 2016) and Davenport (2012), However, disagree, stating that they believe information technology is revolutionizing industry.

5. Conclusion

The study aimed to explore the impact of information technology on distribution centers in Gaborone. Specifically, the goals were to determine how information technology influences distribution center performance, identify stakeholders affected by inefficient technology use, and understand the significance of information technology in these centers. Additionally, the study sought to propose measures to mitigate the negative impacts of technology on distribution center performance.

Data were collected from respondents through distributed questionnaires. The findings suggest that information technology primarily boosts productivity, enhances communication and collaboration, and fosters overall development within distribution centers. Moreover, the study underscores the importance of adapting to technological changes, implementing data analytics, improving communication, and regularly maintaining or upgrading IT infrastructure to address inefficiencies.

Several factors need consideration to minimize these inefficiencies effectively. These include:

- Adapting to Change: Ensuring that staff are trained and prepared to work with new technologies.
- Implementing Data Analytics: Utilizing data analytics to make informed decisions and optimize operations.
- Improving Communication: Enhancing communication channels to facilitate better collaboration among stakeholders.
- Regular Maintenance and Upgrades: Continuously maintaining and upgrading IT infrastructure to keep up with technological advancements and prevent obsolescence.

In conclusion, while information technology offers significant benefits to distribution centers in Gaborone, addressing the challenges associated with its implementation and use is crucial. By focusing on these areas, distribution centers can maximize the positive impact of information technology and enhance their overall performance.

6. Recommendations

Based on the research findings, the following measures are suggested to mitigate inefficient usage of information technology in Botswana.

6.1. Recommendations for IT enhancements

- **Hardware Enhancements:**
 - **Modernizing Computer Systems:** Upgrading existing computers to newer models with faster processors and increased memory can significantly improve the efficiency of data processing and inventory management.
 - **Network Infrastructure:** Implementing high-speed internet connections and reliable network hardware (e.g., routers, switches) can ensure smooth communication and data transfer within and outside the distribution centers.
 - **Mobile Devices and Scanners:** Introducing handheld devices and barcode scanners for real-time inventory tracking and management can reduce errors and improve accuracy in stock handling.
- **Software Enhancements:**
 - **Inventory Management Systems (IMS):** Adopting advanced IMS software can automate inventory tracking, order processing, and stock replenishment, thereby reducing lead times and minimizing human errors.
 - **Enterprise Resource Planning (ERP) Systems:** Implementing ERP systems can integrate various business processes, providing a comprehensive view of operations and facilitating better decision-making.
 - **Customer Relationship Management (CRM) Software:** Utilizing CRM software can enhance customer service by managing customer interactions, tracking sales, and analyzing customer data to improve satisfaction and retention.
- **User Training:**
 - **Technical Training:** Providing ongoing training sessions for employees on the use of new hardware and software ensures that they are competent and comfortable with the technology, leading to more effective utilization.
 - **Cybersecurity Awareness:** Educating staff on cybersecurity best practices can protect the organization's data from potential threats and ensure safe handling of information.

- Change Management Programs: Implementing change management programs can help employees adapt to technological changes more smoothly, reducing resistance and increasing acceptance of new systems.

6.2. Implementation strategy

- Assessment and Planning: Conduct a thorough assessment of the current IT infrastructure and identify specific areas that need enhancement. Develop a detailed implementation plan that outlines the steps, timelines, and resources required for each enhancement.
- Pilot Testing: Start with pilot testing the new systems and hardware in a small section of the distribution center to identify potential issues and gather feedback from users. Make necessary adjustments based on the pilot test results before a full-scale rollout.
- Phased Rollout: Implement the enhancements in phases to ensure smooth transition and minimal disruption to operations. Monitor the performance and impact of each phase, making improvements as needed before moving to the next phase.

6.3. Continuous improvement

- Establish a system for continuous monitoring and evaluation of the IT infrastructure to identify further improvement opportunities. Stay updated with the latest technological advancements and be prepared to integrate new tools and systems that can enhance performance.

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