Transforming Healthcare Delivery through Innovative Inventory Control Technology Strategy: Lessons from Bushenyi District, Uganda

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ABSTRACT

Transforming healthcare service delivery through technology-enhanced inventory control has emerged as a crucial strategy for improving efficiency in resource-limited environments. This study explored the impact of technology integration into inventory control management systems within healthcare facilities in Bushenyi District, Uganda. Grounded in Task-Technology Fit (TTF) Theory, the research utilized a quantitative approach with a correlational design. The target population comprised 192 permanent healthcare workers, from which 130 respondents were selected using the Yamane formula. The study collected primary data through a structured self-administered questionnaire, subsequently analyzed using Statistical Package for Social Scientists (SPSS) version 25. A pilot test involving 13 respondents ensured the validity and reliability of the instrument. Both descriptive and inferential statistics facilitated data analysis. Findings revealed a positive significant relationship between technological integration and service delivery ($t=2.226$, $P=0.028<0.05$). The study concludes that integrating technology significantly enhances service delivery in healthcare facilities. Recommendations urge healthcare facilities to prioritize technology integration within their service delivery processes to boost operational efficiency and improve patient outcomes. Policymakers can utilize these findings to implement initiatives that promote and invest in technological integration within healthcare systems, ultimately improving service delivery and enhancing patient care and operational efficiency.

Keywords: Technology Integration, Strategy, Service Delivery, Healthcare Facility

INTRODUCTION

Effective healthcare service delivery increasingly relies on integrating technology into inventory control management to ensure the timely availability and distribution of medical supplies. Inefficient inventory management can lead to stockouts and waste, adversely impacting patient care and operational efficiency (Aman et al., 2020). By adopting advanced technologies such as automated inventory tracking systems and data analytics, healthcare organisations can optimise supply chain processes and effectively respond to changing patient demands (Bai et al., 2021). Integrating technology in inventory control not only improves service delivery but also contributes to cost savings and efficient resource utilisation in healthcare settings (Murray & McGowan, 2021). As the healthcare landscape evolves and faces resource constraints, leveraging technology in inventory management becomes essential for enhancing overall service delivery (Zhou et al., 2022).

Healthcare facilities in the United States exhibit a complex interplay of quality, accessibility, and efficiency in service delivery, marked by significant strides in technology adoption and a focus on patient-centred care.

The Commonwealth Fund (2021) reports strong performance indicators, such as low mortality rates and high patient satisfaction scores, though disparities persist across regions and populations. Rural areas face greater challenges in accessing quality healthcare services, frequently experiencing longer wait times and limited provider availability, which hinders timely access to essential treatments (Snyder et al., 2020; Rural Health Research Gateway, 2022). Addressing these disparities remains crucial for enhancing overall service delivery, necessitating targeted policy interventions and resource allocation to underserved areas (Bodenheimer & Grumbach, 2016).

Despite several strengths, the U.S. healthcare system faces challenges that impede effective service delivery, including escalating healthcare costs that limit patient access to necessary services (Cohen et al., 2020). High out-of-pocket expenses often lead to delayed or avoided care, negatively impacting health outcomes (Nash et al., 2020). Additionally, staffing shortages, particularly among nursing and primary care professionals, present significant barriers to optimal service delivery, as highlighted by the American Association of Colleges of Nursing (2021), which notes critical nursing workforce shortages exacerbated by burnout and the COVID-19 pandemic. In response, healthcare facilities increasingly adopt telehealth solutions to expand access and alleviate provider shortages, thereby improving patient engagement and continuity of care (Koonin et al., 2020).

The effectiveness of healthcare facilities in Finland is often regarded as among the best globally, characterized by high accessibility, equity, and quality of care. The Finnish healthcare system relies primarily on public funding, ensuring all citizens can access necessary health services without direct costs at the point of service (Käyhkön et al., 2021). Finland consistently ranks highly in international health metrics, including life expectancy and low infant mortality rates, due to comprehensive services covering a wide range of needs (OECD, 2022).

These withstanding, increasing demand for healthcare services driven by an ageing population and chronic diseases poses significant challenges, placing immense pressure on resources and resulting in longer waiting times for elective surgeries (Valtonen et al., 2021; Southeast Finland University of Applied Sciences, 2020). The uneven distribution of healthcare professionals also contributes to these challenges, with urban centres attracting more specialists than rural areas (Niskanen et al., 2020). In response, the Finnish government has implemented strategies to increase funding for healthcare services and enhance training programmes to attract and retain professionals in underserved regions (Finnish Ministry of Social Affairs and Health, 2021).

Incorporating digital health technologies into healthcare facilities in Finland presents considerable challenges. While the country is known for its advanced digital infrastructure, the implementation of solutions like telemedicine and electronic health records has faced obstacles (Erittäin & Kuhlmann, 2021). The COVID-19 pandemic accelerated telehealth adoption; however, issues related to data privacy, system interoperability, and the digital divide among the population persist (Pärssinen et al., 2021). Despite these challenges, digital health technologies have considerable potential to enhance service delivery by improving access to care and streamlining processes. Stakeholders must prioritize robust policies that promote digital health use while ensuring equitable access for all citizens (Heinonen et al., 2021).

The operation of healthcare facilities in Malaysia features a dual system of public and private sectors, offering a wide range of services to the population. Malaysia's healthcare system is known for its accessibility and affordability, with the government allocating significant funds to public healthcare, providing many citizens with services at no direct cost (Ministry of Health Malaysia, 2022). The country achieves commendable health indicators, including high life expectancy and low maternal and infant mortality rates, reflecting its effective healthcare delivery system (World Health Organization, 2021).

However, challenges remain, particularly regarding resource allocation and equitable service distribution between urban and rural areas (Ismail et al., 2021). The increasing demand for healthcare services, driven by a growing population and the prevalence of non-communicable diseases like diabetes and hypertension, strains facilities, resulting in longer wait times for treatments (Chong et al., 2021). Insufficient medical personnel and

inadequate resources further affect services, especially in rural areas. In response, the Malaysian government has implemented strategies to increase funding, enhance training for healthcare professionals, and expand infrastructure to improve service delivery nationwide (Mohd et al., 2021).

Integrating technology into healthcare service delivery in Malaysia presents critical challenges. Although the country has progressed in adopting digital health solutions like electronic health records and telemedicine, implementation remains inconsistent, particularly in rural and underserved areas (Nadarajah et al., 2020). The COVID-19 pandemic accelerated telehealth adoption; however, barriers such as digital literacy and internet access hinder effective implementation (Tay et al., 2021). These challenges can worsen existing health disparities, especially among rural or low-income populations (Abdullah et al., 2021). Addressing these issues requires concerted efforts from the government and stakeholders to develop inclusive digital health policies that ensure equitable access to technology and improve the quality of care in healthcare facilities (Cheng et al., 2020).

The socio-economic landscape and the legacy of unequal healthcare access significantly influence the functioning of healthcare facilities in South Africa. The dual structure of the healthcare system encompasses public and private sectors, with about 80% of the population relying on the public sector, which faces challenges such as underfunding and limited resources (World Health Organization, 2021). The private sector offers superior services, primarily accessible to those who can afford them, creating disparities in health outcomes (Harrison, 2022). Major obstacles include the high burden of communicable diseases like HIV/AIDS and tuberculosis, compounded by rising non-communicable diseases, leading to overburdened facilities and increased patient wait times (Khan et al., 2022). Research shows lengthy queues negatively affect patient satisfaction and health outcomes due to treatment delays (Masango et al., 2021).

To address these challenges, the government has introduced the National Health Insurance system to provide universal health coverage and improve access (Kang & Wyk, 2021). Additionally, a shortage of skilled healthcare personnel, particularly in rural areas, severely impacts service delivery, exacerbated by high attrition rates due to burnout and poor working conditions (Dambisya, 2020). The government aims to enhance training programs and increase incentives for professionals in underserved areas to build a more robust healthcare workforce (Kang & Wyk, 2021).

The adoption of technology into healthcare facilities presents opportunities and challenges for service delivery improvement in South Africa. While electronic health records and telehealth services can enhance access and efficiency, many facilities face inadequate technological infrastructure and low digital literacy among healthcare workers (Walsh et al., 2020). The COVID-19 pandemic accelerated the shift towards digital health solutions; however, disparities in technology access persist, especially in rural and low-income regions (Van der Westhuizen et al., 2021). To address these barriers, stakeholders must prioritise investment in healthcare technology and develop training programmes to improve digital skills among healthcare professionals (Walsh et al., 2020).

The operation of healthcare facilities in Kenya reflects the nation's commitment to equitable and accessible services, with a mixed healthcare system comprising public, private, and faith-based providers. The public sector serves around 60% of the population, especially in rural areas (World Health Organization, 2021). Significant progress has been made through health policies like the Kenya Health Policy 2014-2030, which focuses on improving access, equity, and quality (Ministry of Health, 2021). However, challenges such as inadequate infrastructure, workforce shortages, and inefficiencies persist (Ngoya et al., 2021). Underfunding of public healthcare leads to resource limitations and stockouts of essential medicines, compromising patient care and increasing out-of-pocket costs for those seeking private alternatives (Ombaka et al., 2022; Muriuki et al., 2020). The dual burden of communicable and non-communicable diseases, along with systemic inefficiencies, contributes to long waiting times and overcrowding in facilities (Wamala et al., 2022).

In Uganda, healthcare facilities play a vital role in delivering essential services to a population exceeding 45 million. The Ugandan government has made significant progress in enhancing healthcare access and quality

through the Health Sector Strategic Plan (HSSP), which prioritizes primary healthcare and decentralizes health management to empower local governments (Ministry of Health, 2020; World Health Organization, 2021). Despite these advancements, challenges such as inadequate infrastructure, workforce shortages, and inefficiencies in service delivery persist (Nabudere et al., 2021). Inadequate infrastructure often results in overcrowded facilities and a lack of essential medical supplies, particularly in rural areas, leading to compromised service delivery and increased morbidity and mortality rates (Munyakazi et al., 2020; Katana et al., 2021). Lengthy patient wait times compel individuals to seek care from private providers, which can be costly (Babigumira et al., 2019).

To address these issues, the government has initiated infrastructure development programmes aimed at upgrading existing facilities and constructing new ones, especially in underserved areas (Ministry of Health, 2020). Additionally, the shortage of healthcare professionals, exacerbated by low salaries, poor working conditions, and high attrition rates, hinders service delivery (World Health Organization, 2021; Munyakazi et al., 2020). The government has implemented strategies to enhance compensation, offer scholarships for medical training, and incentivize professionals to work in underserved regions, while strengthening partnerships with educational institutions to improve training programmes (Katana et al., 2021).

Technological integration significantly affects healthcare service delivery in Uganda. The adoption of digital health technologies, including electronic health records (EHRs) and telemedicine, has the potential to enhance access and improve patient outcomes (Nabudere et al., 2021). However, many facilities encounter barriers such as limited technology access, inadequate training, and poor internet connectivity (Munyakazi et al., 2020). The COVID-19 pandemic accelerated the adoption of telehealth services, highlighting the need for comprehensive digital health strategies to bridge service delivery gaps (Katana et al., 2021). Healthcare facilities in Bushenyi District face numerous challenges, including inadequate infrastructure characterized by poorly equipped facilities and insufficient medical supplies, which compromise patient care and extend waiting times (Kanyesigye et al., 2023). The district also suffers from a shortage of skilled healthcare professionals, exacerbated by low remuneration, high attrition rates, and a lack of staff motivation (Mugisha et al., 2021). These challenges provide the backdrop for studying the impact of technology integration strategies on service delivery in this region.

Statement of the Problem

Efficient service delivery in healthcare facilities relies on effective inventory control management, with technology integration enhancing operational efficiency. Proper inventory management ensures the timely availability of essential medical supplies, crucial for maintaining high-quality patient care. Advanced technologies, such as automated systems and data analytics, enable healthcare providers to monitor stock levels in real time and anticipate demand changes, minimising waste and optimising resource allocation (Akhter et al., 2020; Khan et al., 2023). Integrating electronic health records (EHR) with inventory systems facilitates communication among departments, aligning inventory needs with clinical requirements and ultimately boosting patient safety and satisfaction by reducing delays caused by supply shortages (Mukhina & Uvarova, 2021).

The Ugandan government has implemented initiatives to enhance service delivery in healthcare facilities, focusing on infrastructure development, financing, and digital health solutions. A major effort is revitalizing primary healthcare through investments in building and upgrading health centers, especially in rural areas (WHO, 2021). Additionally, increased health budget allocations aim to ensure an adequate supply of medical materials and reduce service delivery bottlenecks (MoH Uganda, 2022). Uganda has also embraced digital health systems to manage patient records and improve care quality (Kasozi et al., 2023).

Healthcare service delivery in Bushenyi District, Uganda, faces significant challenges, including inadequate infrastructure, a shortage of medical personnel, and unreliable medical supplies. Limited funding has hindered the expansion of health facilities and the procurement of essential medicines, resulting in service delays and overcrowded clinics (Ministry of Health Uganda, 2021). Rural areas like Bushenyi struggle to retain healthcare

workers, exacerbating staff shortages (Kato et al., 2022). Additionally, the lack of advanced diagnostic equipment and poor road networks restrict access to timely healthcare services (Nuwagaba et al., 2023). If these challenges persist, healthcare service delivery in Bushenyi District could lead to increased morbidity and mortality rates, prolonged waiting times, and reduced access to essential health services. This study posited that addressing the gap in healthcare service delivery could be achieved through the integration of technology into inventory control management, underscoring the necessity of conducting this research.

Objective of the Study

To establish the extent to which technology integration strategy in inventory control management influences services delivery of healthcare facilities in Bushenyi district, Uganda

Hypothesis of the Study

There is no significant relationship between Technology integration strategy in inventory control management and services delivery of healthcare facilities in Bushenyi district, Uganda

UNDERPINNING THEORY

This study is based on the Task-Technology Fit (TTF) Theory, developed by Goodhue and Thompson in 1995. TTF posits that technology's effectiveness depends on its compatibility with specific organizational tasks. According to TTF, technology can enhance performance only when its capabilities align with task demands. The theory emphasizes that successful technology integration requires a proper match between tools and tasks to optimize efficiency and outcomes (Goodhue & Thompson, 1995).

TTF provides a framework for understanding how technology integration in inventory management can improve service delivery in healthcare facilities by aligning technology capabilities with operational tasks. Goodhue and Thompson (1995) assert that technology enhances performance only when suitably adapted to specific tasks. In healthcare inventory management, tools like automated tracking systems and electronic databases must meet the demands of managing medical supplies and equipment. Implementing technologies that enhance inventory control processes—such as real-time data tracking and predictive analytics—mitigates stockouts and overstock situations, improving the availability of critical supplies (Goodhue, 1998).

By addressing unique challenges in healthcare environments—such as fluctuations in patient demand and regulatory obligations—TTF underscores the importance of selecting technology that meets healthcare facilities' operational needs. This alignment ultimately contributes to improved service delivery and better patient outcomes (Dishaw & Strong, 1999).

Technology Integration in Inventory Control Management and Service Delivery in Healthcare Facilities

Akhter et al. (2020) investigated the impact of automated inventory systems on operational efficiency within healthcare environments. They employed systems theory to explore how automation influences various elements of healthcare service delivery. The researchers used a quantitative research design, gathering data from 300 healthcare providers working in urban hospitals. They ensured validity through expert reviews and achieved a reliability score of 0.82 using Cronbach’s alpha. Data collection involved structured surveys, and regression analysis was utilized for data evaluation. The findings revealed that automated inventory systems significantly decreased stockouts while enhancing service efficiency. The researchers concluded that integrating technology is vital for optimizing inventory control in healthcare settings.

Mukhina and Uvarova (2021) assessed the effects of digital technologies on inventory management in healthcare services. They applied resource dependency theory to illustrate how healthcare institutions depend on technology for effective resource management. The authors adopted a mixed-methods approach, conducting surveys and interviews with 150 healthcare managers. They ensured validity through pilot testing

and reliability with a Cronbach's alpha score of 0.88. Thematic analysis was employed for qualitative data, while descriptive statistics were used for quantitative analysis. The study concluded that digital inventory systems streamlined operations and improved resource utilization.

Khan et al. (2021) explored the influence of cloud-based inventory management systems on service delivery in hospitals. The study was guided by the technology acceptance model (TAM) to understand user adoption of cloud technologies. Researchers utilized a quantitative design with a cross-sectional survey involving 200 hospital staff in major metropolitan areas. Content validity checks were performed, and reliability was confirmed with a Cronbach's alpha of 0.85. The analysis employed structural equation modelling (SEM), revealing that cloud-based systems enhanced communication and reduced errors in supply management. The researchers concluded that cloud integration positively influences service delivery efficiency.

Davis et al. (2022) sought to explore the application of machine learning in predicting inventory requirements in healthcare settings. Grounded in the diffusion of innovations theory, the researchers adopted a quantitative approach with a sample of 250 hospital administrators from various regions. Validity was assured through confirmatory factor analysis, while reliability testing resulted in a Cronbach's alpha of 0.87. Data were collected via structured questionnaires and analyzed using predictive analytics. Findings indicated that machine learning algorithms effectively reduced overstocking and shortages, thus enhancing service continuity. The study concluded that predictive technologies can significantly improve inventory control.

Yuan et al. (2022) examined the integration of electronic health records (EHR) with inventory management systems, using systems integration theory as a foundation. The researchers employed a case study design involving 10 hospitals across different regions and used a qualitative approach to conduct interviews with 100 healthcare administrators. They analysed data using thematic analysis, ensuring validity through triangulation and reliability by cross-checking interview responses. The results demonstrated that EHR integration facilitated improved communication and supply coordination. The researchers concluded that technology integration leads to more effective service delivery.

METHODOLOGY

The study employed a quantitative research methodology to analyze and interpret data gathered from respondents, using measurable variables and statistical tools to draw conclusions. This approach enabled the researcher to generate objective, reliable results by focusing on numerical data that could be measured, compared, and subjected to statistical analysis. A correlational research design was utilized, wherein data was collected and statistically analyzed to explore the relationship between technology integration strategies and service delivery. As presented in Table 1, the target population consisted of 192 respondents from seven departments within the selected medical facilities, including Ishaka Adventist Hospital, Kampala International University-Teaching Hospital (KIU-TH), Bushenyi Health Center IV, and Bushenyi Medical Center (BMC). These departments were specifically chosen for their ability to provide insights into inventory management practices and their impact on service delivery.

Table 1: Target Population

Respondents Department	KIU-TH	Ishaka Adventist Hospital	BMC	Bushenyi Health center IV	Total Population
Procurement	2	1	1	2	6
Pharmacy	8	4	4	3	19
Stores	3	2	2	2	9
Finance	12	4	2	7	25
Audit	3	2	2	2	9

Top Management	10	7	7	10	34
Client/service users	34	20	12	24	90
Total					**192**

Source: Staff Human Resource of the Health Facilities (2024)

The study's sample size was chosen among the 192 target population calculated using Yamane formula.

$$n = \frac{N}{1 + Ne^2}$$

Whereby N = Population

n = Sample size

e^2 = margin error (0.05).

$n=192/1+192(0.05)^2$

n= 129.73

Purposive sampling was employed to ensure the collection of meaningful data by selecting departments capable of addressing the specific research questions. These departments were identified based on their relevant experience, knowledge, and expertise required to respond to the questionnaire. Following this, stratified random sampling was implemented to obtain a fair and proportional sample of respondents from each department, as indicated in Table 2. The diverse composition of the research population influenced this decision. Afterward, simple random sampling was used to select individual respondents to act as analytical units, utilizing computer-generated random numbers for this process.

Table 2: Sample Size

Departments	Population	Sample Size
Procurement Department	6	4
Pharmacy Department	19	13
Store Department	9	7
Finance Department	25	17
Audit Department	9	7
Top Management	34	22
Client/Service Users	90	60
Total	**192**	**130**

Source: Researcher (2024)

Given the respondents' presumed literacy levels, primary data was collected using self-administered structured questionnaires, which consisted of closed-ended questions. These questionnaires were designed to align with the study's quantitative approach. The study objectives guided the formulation of questions, presented on a 4-point Likert scale. To distribute and collect the completed questionnaires, the researcher employed a drop-and-pick-later method at an agreed time.

A pilot study, involving 13 participants (representing 10% of the sample size), was conducted to ensure that the survey questions were clear, understandable, and comprehensive in addressing all aspects of the constructs.

To assess the reliability of the questionnaire, Cronbach's alpha was used, yielding a coefficient of 0.79, which indicated satisfactory reliability. SPSS Software version 25 was employed to calculate this value. Content validity was assessed through the content validity index (CVI), ensuring the questionnaire accurately measured all relevant constructs. The CVI was calculated at 0.8, surpassing the acceptable threshold of 0.7, confirming the questionnaire's validity for the final study.

Both descriptive and inferential statistics were applied to analyse the quantitative data. Descriptive statistics, including percentages, measures of central tendency, and measures of dispersion, were used to examine the respondents' answers in relation to the research questions. To explore the relationship between independent and dependent variables, simple linear regression analysis was utilised. The study specifically used this method to examine the connection between technology integration strategy and service delivery. Pearson's correlation was also conducted to determine the strength and direction of these relationships. A significance level of 0.05 was applied to test the null hypothesis, with the statistical findings presented in tables and figures.

To maintain ethical research standards, the study was reviewed and approved by the Research Ethics Committee (REC) to ensure compliance with ethical guidelines. An introduction letter was obtained from the Directorate of Higher Degrees and Research at the institution. Participants were fully informed about the study's purpose, procedures, risks, and benefits before giving their consent. All participants signed a consent form, affirming their voluntary involvement. Confidentiality and anonymity were strictly observed throughout the study, and no incentives were provided. The research process adhered strictly to ethical guidelines to safeguard the integrity of the study.

RESPONSE RATE

In this study, a total of 130 questionnaires were distributed across various departments, including Procurement, Pharmacy, Stores, Finance, Audit, Client/Service Users, and Top Management. Out of these, 128 questionnaires were successfully recovered, resulting in a response rate of 98.5%. According to Mugenda and Mugenda (2003), a response rate of 50% is considered adequate, 60% is praiseworthy, and 70% or more is regarded as remarkable for data analysis and reporting. Consequently, a response rate of 98.5% is deemed highly appropriate for this study.

Table 3. Response Rate for Questionnaire

Respondents	Questionnaire Distributed	Questionnaire Returned	Non-Response	Response (%)	Non-Response (%)
Facility Staff	130	128	2	98.5%	1.5%

Source: Field Data (2024)

Descriptive Statistics on Technological Integration

The study evaluated the connection between service delivery and technology integration in Uganda's Bushenyi District's healthcare facilities. Using a scale ranging from 1 to 4 data were analyzed as presented in Table 4.

Table 4. Technological Integration and Service delivery in Health Care Facilities

	N	**Mean**	**Std. Deviation**
The use of technology in inventory control management has increased inventory accuracy count rates in the hospital	128	3.34	.667
The use of technology in inventory control management has led to higher inventory turnover rates in the hospital	128	2.90	.762

The use of technology in the control of inventory has led to fast order processing by the hospital	128	3.25	.774
Use of technology has reduced variations in lead time of medical supplies ordered by the hospital	128	2.84	.837
Use of technology in inventory management has protected sensitive inventory data of the hospital	128	3.34	.679
The use of technology has improved inventory forecasting in the hospital	128	3.27	.704
MTI		3.1549	.41840

Source: Field Data (2024)

The overall mean score for technology integration is 3.1549 with SD of 0.41840, indicating that respondents generally agreed with the statements on the influence of technological integration on service delivery in healthcare facilities.

Regarding the statement about whether the hospital's inventory accuracy count rates have improved due to technology in inventory control management, a mean score of 3.34 and SD of 0.667 demonstrate that a significant majority of respondents recognized an enhancement in inventory accuracy.

When assessing the impact of technology on inventory turnover rates, a mean response of 2.90 and SD of 0.762 indicate that most of the respondents agreed with the statement.

In response to the statement regarding the influence of technology on fast order processing within the hospital, a mean score of 3.25 and SD of 0.774 imply that most of the respondents were in agreement with the statement.

Concerning the reduction of variations in lead time for medical supplies ordered by the hospital, a mean score of 2.84 and SD of 0.837 indicate that majority of the participants agreed with this statement.

On the matter of whether technology in inventory management has protected sensitive inventory data of the hospital, a mean response of 3.34 and SD of 0.679 show that most of the respondents concurred with this statement.

Regarding the statement that the use of technology has improved inventory forecasting in the hospital, a mean response of 3.27 and SD of 0.704 show that most of the respondents concurred with this statement.

Descriptive on Service Delivery

The study assessed the health care providers' service delivery in health care facilities in Bushenyi District, using measures of central tendency on a scale ranging from1 to 4. The data is presented in Table 5

Table 5. Service Delivery of Health Care Facilities in Bushenyi District

	N	Mean	Std. Deviation
The ordering cycle time of medical supplies in the hospital is efficient	128	2.90	.850
The cost of carrying medical supplies in the hospital is sufficient	128	2.70	.757
There is operational efficiency of inventory control practices in the hospital	128	3.00	.710
There is supplier diversification of medical supplies in the hospital	128	2.73	.830
MSD		2.8320	.54800

Source: Field Data (2024)

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The overall mean score for Service Delivery is 2.8320 with SD of 0.54800, indicating that respondents generally agreed with the statements on service delivery in healthcare facilities.

Assessing on whether the ordering cycle time of medical supplies in the hospital is efficient, the mean response of 2.90 and SD of 0.850 suggest that most respondents generally supported this statement.

Regarding the sufficiency of the cost of carrying medical supplies in the hospital, a mean response of 2.70 and SD of 0.757 imply that most of the respondents concurred with the statement.

On whether there is operational efficiency in the inventory control practices of the hospital, a mean response of 3.00 and SD 0.710 indicate the agreement regarding operational efficiency.

confirming whether there is supplier diversification for medical supplies in the hospital, a mean response of 2.73 and 0.830 demonstrate that majority of the respondents concurred with the statement.

Simple Linear Regression Analysis on Technology Integration and Service Delivery

Technological integration was assessed to determine the extent to which it influences the service delivery in health care facilities in Bushenyi District Uganda and this was achieved by testing null hypothesis

Table 6. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.195[a]	.038	.030	.53966

a. Predictors: (Constant): Technological Integration b. Dependent variable: Service Delivery

Source: Field Data (2024)

The model demonstrates a weak but positive relationship between technological integration and service delivery, indicated by an RRR value of 0.195. This suggests that as technological integration increases, there is a slight improvement in service delivery. However, the R2R^2R2 value of 0.038 indicates that technological integration explains only 3.8% of the variation in service delivery. This means that a substantial 96.2% of the variation remains attributable to external factors not captured by the model.

The goodness of fit of the model was also evaluated using ANOVA[a]

Table 7: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.443	1	1.443	4.956	.028[b]
	Residual	36.695	126	.291		
	Total	38.139	127			

a. Dependent Variable: Service Delivery

b. Predictors: (Constant)Technological Integration

Source. Field Data (2024)

The model was a good fit for the data ($f=4.956$, $p=0.028$, $p<0.05$) and it significantly and linearly predicted service delivery

Table 8: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.028	.364		5.568	.000
	MTI	.255	.114	.195	2.226	.028

a. Dependent Variable: Service Delivery b. predictor (Technology Integration Strategy)

Source: Field Data (2024)

Hypothesis Testing: The null hypothesis (H_0) posited that no significant relationship exists between technological integration and service delivery in healthcare facilities. The results indicate a positive and significant relationship between the two variables, with a t-value of 2.226 and a p-value of 0.028 ($p < 0.05$). Given this evidence, the null hypothesis was rejected in favor of the alternative hypothesis, which asserts that a positive relationship between technological integration and service delivery does exist.

Correlation Analysis on Technology Integration and Service Delivery

The researcher conducted a Pearson correlation analysis to establish the strength and direction of the relationship between Inventory control management strategies and service delivery.

Table 9: Correlation Analysis

		MTI	MSD
MSD	Pearson Correlation	.195*	1
	Sig. (-tailed)	.028	
	N	128	128

a. MTI (Predictor): Technology Integration Strategy

b. MSD (Dependent variable): Service Delivery

Source: Field Data (2024).

The results shows that there is a significant positive correlation between technological integration and service delivery ($r=.195^*$, $p=0.028$, P-value <0.05) hence forming the basis of rejecting the null hypothesis and adopting the alternative hypothesis.

DISCUSSION OF FINDINGS

The findings of this study are consistent with the research of Akhter et al. (2020), who established that implementing automated inventory systems significantly decreased stockouts and enhanced overall efficiency in healthcare services. Their study emphasized that automation not only streamlined inventory processes but also contributed to timely patient care, ultimately improving service delivery.

Similarly, Mukhina and Uvarova (2021) reported that integrating digital technologies in inventory control led to better resource utilization and decreased wastage in healthcare facilities. Their findings highlighted that technology-driven inventory systems improved the tracking of medical supplies, thereby enhancing service delivery and increasing patient satisfaction.

These results align with those of Khan et al. (2021), who found that cloud-based inventory management systems improved communication and coordination among healthcare providers, resulting in fewer errors in

supply management. The study concluded that cloud technology significantly enhanced service delivery by ensuring healthcare facilities had the necessary supplies available when needed.

Additionally, the findings are in agreement with Davis et al. (2022), who highlighted that machine learning algorithms in inventory management led to more accurate supply forecasts and reduced operational inefficiencies. Their research suggested that integrating predictive analytics into inventory control can substantially improve service continuity and enhance patient outcomes.

The findings concur with Yuan et al. (2022) who found that integrating electronic health records (EHR) with inventory management systems improved interdepartmental communication, facilitating more efficient supply coordination. Their study concluded that EHR integration is essential for optimizing inventory control and enhancing service delivery in healthcare facilities.

CONCLUSION

The findings of this study indicate a significant positive relationship between the integration of technology in inventory control management and the service delivery of healthcare facilities, as demonstrated by a t-value of 2.226 and a p-value of 0.028 ($p<0.05$). This outcome implies that adopting advanced technological solutions in inventory management plays a crucial role in enhancing operational efficiency and service quality within healthcare environments.

RECOMMENDATIONS

Healthcare administrators should prioritize investments in advanced inventory management systems incorporating automation, cloud computing, and AI to streamline inventory processes, reduce operational inefficiencies, and ensure critical supplies are available. Implementing training programs for staff to use these technologies effectively will facilitate their adoption, enhance service delivery, and encourage a culture of innovation. Establishing a data management framework is essential to enable real-time monitoring and informed decision-making for inventory control. Interdepartmental collaboration should be encouraged to align inventory management with patient care needs, and policymakers can support these efforts by providing incentives, funding, or grants to accelerate technology adoption in healthcare.

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