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Research Article

Optimizing Digital Transition: Addressing Challenges in Modernizing Inventory Systems in Primary Healthcare Facilities

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ABSTRACT

This study investigates the challenges and potential solutions associated with modernizing inventory systems in primary healthcare facilities in the National Capital Region (NCR) of the Philippines, emphasizing operational efficiency, resource management and staff training. A descriptive research design was applied, using both quantitative and qualitative approaches. Data was collected from 67 trained staff members through purposive sampling, ensuring diverse perspectives across various organizational roles. The questionnaire was evaluated in relation to users' perceptions of satisfaction, operational efficiency, and the perceived difficulties with digital inventory systems. Reliability is established with the help of Chronbach's Alpha, and ANOVA, used in establishing the relationship between user satisfaction and operational effectiveness. From the thematic analysis of the questionnaire, lack of infrastructure, lack of training, and fractured supply chains were pointed out as being the obvious challenges that reduce the smooth digital transition. The study found that while digital transformation has the potential to enhance inventory management and healthcare delivery, significant barriers must be addressed to achieve full adoption. Overall, findings help highlight the need for focussed training with strong digital solutions in optimizing resource management and service delivery in public health settings, providing valuable insights for policymakers and healthcare administrators.

Keywords: *Digital Transformation, Modernization, Health Information Systems, Inventory Management, Primary Healthcare, Supply Chain, System Optimization, Public Health, User Response, Operational Efficiency, Technical Assistance*

Introduction

Digital healthcare systems face substantial challenges due to infrastructure that has been pursued in siloes, resulting in a fragmented digital health landscape. Barriers to data integration result in inefficient health and public

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health systems, which are unable to access critical data from a wide variety of sources (CDC, 2022). These infrastructure problems hamper the adoption of inventory management systems in healthcare, affecting the real-time tracking of medical supplies (Gichoya, 2005).

Public health centers in NCR often lack the necessary hardware and reliable internet connections to support robust digital systems. And most healthcare facilities use separate platforms for inventory management, patient records, and financial systems, leading to data inconsistencies and difficulties in managing medical supplies across different facilities (DOH, 2019). A survey conducted by the University of the Philippines Manila revealed that while healthcare workers recognize the importance of digital tools, many lack the necessary skills to use inventory management software effectively. This lack of training leads to suboptimal utilization of digital systems and a reliance on manual methods, which are prone to error (University of the Philippines Manila, 2020).

Also, the fragmented supply chains result in frequent stockouts and overstock situations, primarily due to lack of real-time data and poor coordination among suppliers and healthcare facilities is a significant barrier to optimizing inventory systems (Philippine Institute for Development Studies, 2019). A 2020 study by Mendoza and Dy discusses how regulatory barriers, such as stringent requirements for data management and privacy, hinder the adoption of modern inventory systems in primary healthcare facilities.

The integration of these digital technologies across different sectors will, therefore, become a significant driver for efficiency and innovation as well as operational effectiveness in most sectors. In the public health sector, effective management in SCM is a basic requirement to ensure timely delivery of medical supplies with reduced stockouts and better quality service provision for healthcare. Supply chain management in public health care, specifically in urban cities like the National Capital Region (NCR) of the Philippines, has been a challenge that utilizes manual processing and has no real-time data and asset inventory control.

Digital transformation offers effective solutions by automating inventory management and procurement processes, which minimizes manual labor and errors in tracking and ordering supplies. This also provides real-time analytics, which supports high productivity as it responds immediately to the most urgent needs, such as fast track delivery of supplies in case of an outbreak. It also makes every detail visible regarding the used supplies, helping plan better, reduce waste, and provide optimum patient care. Overall, digital transformation gets to enhance the efficiency as well as improve the delivery of services for primary health care facilities better.

This study tries to identify the challenges of the inventory system modernization process in primary health care facilities. Providing solutions and support to primary health care facilities would be achieved by addressing the challenges identified. The intent is a new digital inventory system with full adoption and use that should yield successful adoption for improvements in the management of resources, better efficiency in the operations, and on-time guaranteed access to necessary stock levels of medicines. Consequently, improvement in supply chain operations will be realized and thus an improvement in healthcare delivery and equity.

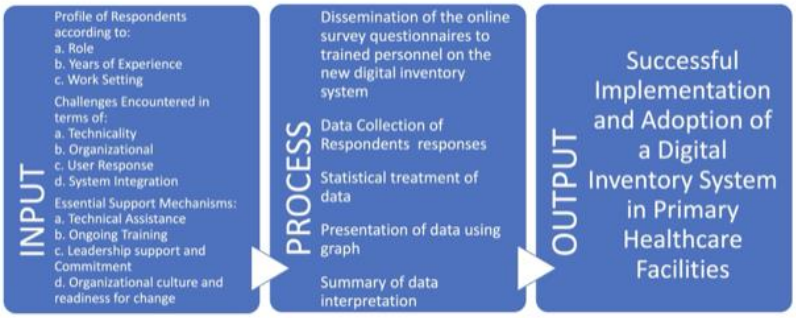

Figure 1. Input-Process-Ouput Model (IPO Model)

This conceptual framework aims to guide the understanding and implementation of effective strategies for optimizing the digital transition. By framing the digital transition of inventory systems within this approach, primary healthcare facilities can navigate the complexities of modernization effectively. The researchers utilized the Input-Process-Output Model, illustrated in Figure 1. This model emphasizes the significance of recognizing demographic factors, the challenges encountered, and the essential support mechanisms. It outlines the process for gathering and analyzing data, demonstrating how effectively addressing these challenges can facilitate the successful implementation and adoption of a digital inventory system in primary healthcare facilities, ultimately resulting in improved operational efficiency, higher user satisfaction, and better data management outcomes.

The input consists of the respondents' demographic profiles and the current challenges they face, which serve as independent and mediating variables. All the questions outlined in the statement of the problems are included in this section.

The process includes the target respondents which consists of all trained personnel on the new inventory system, questionnaires are distributed via an online google form survey. The collected data is analyzed using statistical methods and presented through graphs. Additionally, a summary of the final results and recommendations is included.

The output comprises the action plan developed following the interpretation of the final results. Recommendations are provided to the relevant organizations, particularly primary healthcare facilities, on how to successfully implement and adopt the new digital inventory system.

Methodology

Research Design

The primary purpose of this study is to optimize the digital transition of inventory systems in primary healthcare facilities by addressing implementation challenges. The impact of the newly introduced digital system will, therefore, be measured through its effects on operation efficiency, user satisfaction, and general performance, thus enhancing the public health delivery services. A mixed-methods research design was employed, integrating quantitative data—such as user satisfaction ratings and operational efficiency metrics—with qualitative insights from open-ended survey responses. This approach allows for a comprehensive understanding of both measurable impacts and nuanced human experiences, capturing a fuller picture of the system's effectiveness.

The study, conducted over a month, included a literature review, participant recruitment, data collection, analysis, and report writing. The survey phase involved a structured questionnaire that provided some quantitative insights into demographics and user experiences. Respective responses were rated based on the Likert scale to identify technical challenges and support mechanisms. Open-ended questions bring up qualitative information about barriers and strategies that can contribute to success. This mixed-method design identifies particular challenges but, at the same time, enriches analysis by highlighting user perceptions, thereby allowing for well-informed discussions on improving public health service delivery and the implementation strategies of digital systems.

Population and Sampling

The target population for this study consists of trained staff members working in public primary healthcare facilities within the National Capital Region. A purposive sampling technique was used in order to select participants. This kind of non-probability sampling selects the desired individuals who possess a good amount of knowledge and experience regarding digital inventory systems. In this study, all such trained participants was included so that a variety of ranges of perspectives would be covered while keeping the data manageable for collection and analysis. The sample size was perceived to be the minimum necessary to ensure saturation in qualitative data. Therefore, it will allow capturing most of the main themes relevant to the challenges and benefits of the digital transition.

A purposive sampling technique to guarantee representation across various

organizational levels: Encoder (33 respondents, 48.5 percents of 67 total respondents), Health center staff (22 respondents, 32.4 percents of 67 total respondents), Pharmacist (11 respondents, 16.2 percents of 67 total respondents) and Supply Officer (2 respondents, 2.9 percents of 67 total respondents)

Research Instrument

A structured questionnaire was designed for the collection of quantitative data regarding user satisfaction, efficiency in operations, and perceived difficulties of the digital inventory system. The questionnaire was closed-ended with items of Likert scales to assess attitudes and perceptions concerning usability, effectiveness, and support mechanisms. It captured the respondents' demographic questions on their roles, levels of experience, and the nature of facilities.

The research instrument was reviewed and validated by an expert in the academe. All comments and recommendations for improvement were incorporated. The use of Google Forms facilitated efficient data collection and management, ensuring the accuracy of the data gathering.

Data Gathering Procedure

The survey questionnaire was created using Google Forms. The link was distributed online using emails, social media, and text messaging to improve participant convenience and accessibility. The survey was available for three days (23 September 2024 to 26 September 2024), with further reminders sent to non-respondents to ensure a satisfactory response rate.

Researchers ensured a respectful and supportive atmosphere throughout the data-gathering process which was characterized by greater freedom on the part of the participants to contribute their thoughts freely. The study aimed to gather rich and diverse data through a systematic procedure for gathering data throughout the study.

Data Analysis Procedure

All gathered data were first validated for accuracy and completeness using Cronbach's Alpha test. The said data were analyzed using the Data *Analysis in Jamovi*, along with statistical tests like Analysis of Variance (ANOVA). This is to examine differences across groups and relationships between key variables, such as User satisfaction and operational efficiency.

The findings were analyzed which will serve as the basis in developing relevant conclusions and recommendations of the study.

Ethical Considerations

The study obtained approval from respondents by including a confidentiality statement and adhering to the Data Privacy Act of the Philippines (Republic Act No. 10173, series of 2012). All personal information collected was treated with the highest level of confidentiality and used solely for academic purposes. Respondents were allowed to access, modify, and request a copy of their submitted data at any time through Google Forms. Security measures were implemented to protect the data, which was retained only for the necessary duration. Upon completion of the research, the data was either securely stored for future reference or disposed of in accordance with the Data Privacy Act.

Results And Discussion

Results Overview

This chapter summarizes the research findings related to the digital transformation of inventory systems in primary healthcare facilities in the National Capital Region (NCR), which are in line with the study's goals. The findings provide insightful demographic information on the trained employees who participated in the survey.

The discussions address respondents' levels of awareness regarding the digital inventory system, the challenges they encountered during implementation, and their overall satisfaction with the new system. The presentation of data was supported by statistical analyses, utilizing summary tables and figures where appropriate to highlight significant findings.

Demographic Profile of the Respondents

A total of 67 respondents participated in the survey, composed of different primary health care facility staff in National Capital

Region who were already trained in the new digital inventory system.

Table 1 summarizes the demographic profile of respondents, detailing stakeholder categories, and years of experience. These criteria offer insight into the variety of perspectives collected in this study.

Table 1. Demographic Distribution of the Respondents

Respondents' Profile	**Frequency**	**Percentage** (%)
Role		
Encoder	33	48.5
Health Center Staff	22	32.4
Pharmacist	11	16.2
Supply Officer	2	2.9
Length of involvement with inventory management		
1-3 years	26	38.2
4-7 years	10	14.7
Less than 1 year	23	33.8
More than 7 years	9	13.2
Type of healthcare facility		
Health Center	50	73.5
LGU Warehouse	16	23.5
Program Coordinator's Office	2	2.9
Male	166	131

As per the data, there is a wide spectrum of roles as far as inventory management is concerned, where 48.5 % of the respondents are Encoders, 32.4 % are Health Center Staff, 16.2 % are Pharmacists, and only 2.9 % are Supply Officers. Looking at the distribution of the respondents, it indicates that not all respondents are directly engaged in inventory management, potentially impacting their commitment to the digital transformation efforts.

Concerning years of experience, they mostly had 1-3 years of experience 38.2%, and 33.8% of them had less than a year. This then depicted an inexperienced workforce, which may influence their acceptance and proficiency with the new digital inventory system. On the contrary, 13.2% have more than 7 years of experience, indicating that while they are a minority, their expertise could significantly affect the system's implementation and use. Also certain factors—such as experience or role specialization, for instance the Encoders managing inventory instead of Pharmacists—could exert some influence.

Among the types of healthcare facility respondents, 73.5% work at Health Centers, a lower number came from the LGU Warehouses (23.5%) or Program Coordinator's Offices (2.9). This highlights the predominance of smaller local healthcare units, which may face unique challenges related to resource availability and technical capacity.

Level of Influence of Demographic Factors

The following data assessed how various demographic factors influence the success of digital transformation in inventory management. The respondents' level of agreement with statements related to these factors is summarized in **Table 2.**

Table 2.

Level of Influence of Demographic Factors	**Mean**	**SD**	**Verbal interpretation**
[I am familiar with digital inventory management systems.]	3.15	0.53	Agree

Level of Influence of Demographic Factors	Mean	SD	Verbal interpretation
[I have received sufficient training on digital inventory management systems.]	3.10	0.52	Agree
[My role provides me with sufficient influence to drive the digital transformation of inventory management systems.]			
[My years of experience influence my adaptability to digital inventory systems.]	3.06	0.54	Agree
[The type of facility I work in influences the success of digital inventory transformation.]	3.03	0.46	Agree
[The digital transformation of inventory management has improved the efficiency of healthcare delivery in my facility.]	3.04	0.44	Agree
[My role in the healthcare facility has a significant influence on the success of the digital transformation.]	3.09	0.41	Agree
[My healthcare facility has sufficient technological resources (e.g., computers, software, internet connectivity) for digital inventory management.]	2.85	0.70	Agree
[I am familiar with digital inventory management systems.]	3.15	0.53	Agree
[I have received sufficient training on digital inventory management systems.]	3.10	0.52	Agree
[My role provides me with sufficient influence to drive the digital transformation of inventory management systems.]	3.00	0.57	Agree
[My years of experience influence my adaptability to digital inventory systems.]	3.06	0.54	Agree
[The type of facility I work in influences the success of digital inventory transformation.]	3.03	0.46	Agree
[The digital transformation of inventory management has improved the efficiency of healthcare delivery in my facility.]	3.04	0.44	Agree
[My role in the healthcare facility has a significant influence on the success of the digital transformation.]	3.09	0.41	Agree
[My healthcare facility has sufficient technological resources (e.g., computers, software, internet connectivity) for digital inventory management.]	2.85	0.70	Agree
Overall Mean	**3.04**	**0.40**	**Agree**

Strongly Disagree (1.00-1.75); Disagree (1.76-2.50); Agree (2.51-3.25); Strongly Agree (3.26-4.00)

According to data, demographic factors, such as role (M=3.00, SD=0.57), experience (M=3.06, SD=0.54) and facility type (M=3.03, SD=0.46) all received responses indicating that participants agree these elements significantly influence success of digital transformation. The assertion regarding efficiency improvement through digital transformation (M=3.04, SD=0.44) indicates that respondents perceive a connection between digital inventory management and operational efficiency. Because of moderately high levels of agreement, this further implies a relationship exists between overcoming technical challenges (e.g., familiarity and training) and enhanced operational efficiency.

Currently, there is no direct data concerning organizational resistance; however, the prevailing consensus surrounding familiarity, training and resource availability, indicates that respondents do not perceive overwhelming resistance. The consensus that roles exert influence (M=3.00, SD=0.57) suggests user satisfaction could be positively affected by clearly defined roles within the context of digital transformation. Although specific data on technical assistance is lacking, the comparatively low mean score for adequate technological resources (M=2.85, SD=0.70) points to a pressing need for additional technical support. Because technological resources are deficient, such assistance would be essential for successful implementation. Respondents also concur that the type of facility influences success (M=3.03, SD=0.46), suggesting that variations in control measures (e.g., larger facilities with more stringent controls) could impact system adoption.

Level of Technical, Organizational, User Response, and Integration Challenges Faced
Table 3. Level of Technical Challenges

Level technical challenges	Mean	SD	Verbal Interpretation
[Users encounter frequent system crashes or errors while using the digital inventory system.]	2.94	0.57	Agree
[Users experience delays and lag when performing tasks in the digital inventory system.]	3.07	0.61	Agree
[Users experience difficulties with system security features, such as login issues or access controls.]	2.62	0.65	Agree
[Users have trouble finding and using the features they need in the digital inventory system.]	2.68	0.66	Agree
Overall Challenges	**2.83**	**0.50**	**Agree**

Strongly Disagree (1.00-1.75); Disagree (1.76-2.50); Agree (2.51-3.25); Strongly Agree (3.26-4.00)

Based on the results, the respondents generally agree that there are technical challenges in the use of the digital inventory systems (M = 2.83, SD = 0.50). The highest challenge reported was the delays and lag in the system (M = 3.07, SD = 0.61), while challenges related to system security (M = 2.62, SD = 0.65) were still significant, but deemed less critical.

Table 4. Level of organizational Challenges

Level organizational challenges	Mean	SD	Verbal Interpretation
[Users face challenges due to a lack of adequate staffing and financial resources for the new system.]	3.03	0.65	Agree
[Users are not well-informed about how the digital inventory system will improve their work processes.]	2.32	0.66	Agree
[Users feel that their concerns and suggestions regarding the system are not addressed by the organization.]	2.37	0.67	Agree
[Users face difficulties due to poor planning and execution of the system's rollout.]	2.54	0.66	Agree
[Users feel that the organization is not fully committed to the successful implementation of the new system.]	2.35	0.75	Disagree
Overall Challenges	**2.52**	**0.52**	**Agree**

Strongly Disagree (1.00-1.75); Disagree (1.76-2.50); Agree (2.51-3.25); Strongly Agree (3.26-4.00)

Organizational challenges reveal that the lack of resources (M = 3.03, SD = 0.65) constitutes a significant issue that could negatively impact operational efficiency. This could lead to dissatisfaction, especially if concerns are not being addressed (M = 2.37, SD = 0.67). Furthermore, planning and execution challenges were significant (M = 2.54, SD = 0.66). However, respondents did not agree with statements indicating that they were unaware about the benefits of the system (M=2.32, SD=0.66).

Table 5. Level User Response Challenges

Level user response challenges	Mean	SD	Verbal Interpretation
[Users are resistant to adopting the new digital inventory system.]	2.63	0.69	Agree
[Users do not receive adequate training on how to use the new digital inventory system.]	2.32	0.68	Disagree
[Users find the interface of the digital inventory system confusing and not user-friendly.]	2.46	0.63	Disagree
[Users' feedback on the digital inventory system is not adequately considered or addressed.]	2.38	0.62	Disagree
[The new digital inventory system does not meet users' needs and expectations.]	2.34	0.64	Disagree
Overall Mean	**2.43**	**0.51**	**Disagree**

Strongly Disagree (1.00-1.75); Disagree (1.76-2.50); Agree (2.51-3.25); Strongly Agree (3.26-4.00)

Respondents generally disagreed with the presence of user response challenges (M = 2.43, SD = 0.51). However, there was some agreement that resistance to adopting the new system existed (M = 2.63, SD = 0.69). The lack of sufficient training (M = 2.32, SD = 0.68) and feedback consideration (M = 2.38, SD = 0.62) were also identified, which indicate areas for improvement. However, users' overall satisfaction with system usability and feedback mechanisms, indicates that the adoption process is progressing smoothly without significant risks to control measures. There remains no clear evidence suggesting that challenges in user responses are related to the adoption of control measures impacting system security or data integrity.

Table 6. Level Integration Aspect Challenges

Level integration aspect challenges	Mean	SD	Verbal Interpretation
[Users frequently encounter issues when trying to connect the digital inventory system with other systems in use.]	2.59	0.65	Agree
[Users have difficulty keeping data consistent between the digital inventory system and other systems.]	2.51	0.68	Agree
[Users find it hard to adjust their regular tasks to accommodate the new digital inventory system.]	2.74	0.68	Agree
[Users struggle to get effective help with integration problems due to limited technical support.]	2.65	0.69	Agree
[Users find it challenging to modify the system to fit their unique integration requirements.]	2.76	0.63	Agree
Overall Mean	**2.65**	**0.56**	**Agree**

Strongly Disagree (1.00-1.75); Disagree (1.76-2.50); Agree (2.51-3.25); Strongly Agree (3.26-4.00)

The challenges related to system integration were agreed upon by respondents (M = 2.65, SD = 0.56) which suggests that these issues could affect operational efficiency; however, because the challenges are not extreme, their impact on efficiency might not be drastic enough. The difficulty of modifying the system to meet specific needs is the most significant challenge (**M = 2.76, SD = 0.63**). This suggests that the digital inventory system may lack the flexibility required for seamless integration with other systems and workflows. Users report moderate agreement with challenges related to receiving technical support for integration issues; however, the challenges do not seem to be severe enough that technical support has no significant relationship with successful implementation. The challenges with integration—especially around data consistency and technical support—could affect control measures related to data integrity and accessibility.

Potential Impact of a Digital Inventory System on Operational Efficiency, User Satisfaction, and Overall Performance
Table 7.

Level Potential Impact of a Digital Inventory System on Operational Efficiency, User Satisfaction, and Overall Performance	**Mean**	**SD**	**Verbal Interpretation**
[The previous inventory management system was efficient.]	2.85	0.47	Agree
[The new digital inventory system has significantly increased the speed of inventory processing.]	2.88	0.50	Agree
[The new system has significantly improved the accuracy of inventory tracking.]	2.96	0.50	Agree
[The new system has significantly reduced the time spent on manual inventory checks and adjustments.]	2.88	0.64	Agree
[The new system is highly effective in integrating with other operational systems.]	2.90	0.55	Agree
[I am satisfied with the training provided for the new system.]	3.01	0.53	Agree
[I have encountered many technical issues or bugs with the new system.]	2.66	0.64	Agree
[I am satisfied with the new digital inventory system.]	2.94	0.45	Agree
[The new digital inventory system has significantly increased overall productivity in my department.]	2.84	0.56	Agree
[The new system has significantly decreased the cost of inventory management.]	2.78	0.51	Agree
[The new system has significantly improved decision-making and forecasting in inventory management.]	2.91	0.51	Agree
[The new system has significantly improved customer satisfaction.]	2.85	0.58	Agree
Overall Mean	**2.87**	**0.37**	**Agree**

Strongly Disagree (1.00-1.75); Disagree (1.76-2.50); Agree (2.51-3.25); Strongly Agree (3.26-4.00)

With a mean score of 2.87 indicates that respondents generally agree on the potential positive impact of the digital inventory system on operational efficiency, user satisfaction, and overall performance. Despite some agreement on the presence of technical issues (M = 2.66), positive impact on operational efficiency—such as speed and accuracy improvements—suggests technical challenges are not significantly undermining operational outcomes. User satisfaction with training and the system's overall performance (M = 3.01) indicates that

organizational resistance, if present, does not significantly reduce satisfaction. The relatively high agreement on improved accuracy (M = 2.96) and decision-making (M = 2.91) suggests that system adoption has had a positive impact on operational controls; however, the moderate level of agreement indicates that the system adoption does not seem to be significantly impacted by the presence of control measures or risks to data integrity, although one might argue otherwise.

Technical Support and Ongoing Assistance for Effective Implementation and Sustainable Operation of Digital Inventory Systems
Table 8.

Level Technical Support and Ongoing Assistance for Effective Implementation and Sustainable Operation of Digital Inventory Systems	**Mean**	**SD**	**Verbal Interpretation**
[Comprehensive training programs can improve employee skills and confidence in using new systems effectively]	3.28	0.45	Strongly Agree
[Detailed user guides or manuals significantly improve user understanding and ease of use of new systems]	3.26	0.48	Strongly Agree
[Pilot testing and phased implementation help identify potential issues early and facilitate smoother transitions to new systems]	3.24	0.49	Agree
[Incentives and support encourage user adoption and engagement with new systems and processes]	3.25	0.44	Agree
Overall Mean	3.26	0.41	**Strongly Agree**

Strongly Disagree (1.00-1.75); Disagree (1.76-2.50); Agree (2.51-3.25); Strongly Agree (3.26-4.00)

An overall mean of 3.26 reflects strong agreement among respondents on the necessity of technical support and ongoing assistance in the implementation of the digital inventory systems. The high mean scores for training programs (3.28) and user guides (3.26) highlight the importance of effective training and resources in fostering confidence and competence in using new systems.

Effects of Adopting a Digital Inventory System on Data Accuracy, Accessibility, and Security
Table 9. Effects of Adopting a Digital Inventory System on Data Accuracy, Accessibility, and Security

Level Effects of Adopting a Digital Inventory System on Data Accuracy, Accessibility, and Security	**Mean**	**SD**	**Verbal Interpretation**
[The accuracy of our current inventory management system is satisfactory.]	2.93	0.43	Agree
[I believe that transitioning to a digital system will improve data accuracy.]	3.13	0.38	Agree
[Current inventory data is easily accessible to relevant staff members.]	2.97	0.52	Agree
[I believe that a digital inventory system will enhance data accessibility.]	3.12	0.44	Agree
[Our current inventory management system is secure against unauthorized access.]	2.97	0.46	Agree
[I feel that a digital inventory system will provide better data security.]	3.09	0.38	Agree
Overall Mean	**3.03**	**0.35**	**Agree**

Strongly Disagree (1.00-1.75); Disagree (1.76-2.50); Agree (2.51-3.25); Strongly Agree (3.26-4.00)

Strategies to Enhance Staff Adaptability During the Transition to a Fully Digital Inventory Management System

Table 10. Strategies to Enhance Staff Adaptability During the Transition to a Fully Digital Inventory Management System

Level Strategies to Enhance Staff Adaptability During the Transition to a Fully Digital Inventory Management System	Mean	SD	Verbal Interpretation
[Extensive training programs are necessary to ensure that staff members can adjust to a digital system.]	3.35	0.48	Strongly Agree
[Providing hands-on workshops increases confidence in using the new system.]	3.40	0.49	Strongly Agree
[Regular updates regarding the transition from management are important for staff involvement.]	3.34	0.48	Strongly Agree
[Implementing a phased approach to the transition will ease staff adaptation.]	3.26	0.51	Strongly Agree
[Regular feedback sessions during the transition help address staff concerns effectively.]	3.29	0.57	Strongly Agree
[Continuous improvement based on staff input will enhance the overall transition experience.]	3.37	0.52	Strongly Agree
Overall Mean	**3.34**	**0.45**	**Strongly Agree**

Strongly Disagree (1.00-1.75); Disagree (1.76-2.50); Agree (2.51-3.25); Strongly Agree (3.26-4.00)

The focus on training and support suggests that the effective strategies for tackling technical challenges tend to correlate with enhanced operational efficiency, with a total mean of 3.34, this indicates strong agreement on strategies to enhance staff adaptability during the transition to a digital inventory system. The agreement concerning the value of feedback sessions (M=3.29, SD=0.57) and continuous improvement (M=3.37, SD=0.52) implies that addressing resistance through structured strategies can improve user satisfaction. The strong emphasis on training (M=3.35, SD=0.48) and continuous support indicates technical assistance is vital for the successful implementation of the digital inventory system. The recognition of the necessity for training and hands-on workshops (M=3.40, SD=0.49) implies that adopting a digital system appears closely linked to the implementation of robust training and support measures.

Table 11.

Relationship between Demographic Profile and Effects of Adopting a Digital Inventory System on Data Accuracy, Accessibility, and Security	r	p-value	Interpretation
Role	13.367	1.00	Not Significant
Years of Experience	17.425	0.996	Not Significant
Type of Healthcare Facility they work	9.176	0.999	Not Significant

**. Correlation is significant at the 0.05 level (2-tailed).*

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

There is no significant relationship between demographic factors (role, years of experience, type of healthcare facility) and the effects of adopting a digital inventory system. However, the hypothesis remains distinct from the demographic factors; the absence of significant correlations in the demographic data may suggest that such factors do not play a role in how technical challenges affect operational efficiency either. Although current data does not

directly address the hypothesis, the lack of significant relationships across demographic variables implies that factors affecting user satisfaction may also be independent of these demographic characteristics. This absence of significant correlations in demographic data fails to provide insights about technical assistance; however, it does imply that demographic profiles might not influence perceptions regarding the need for support. Furthermore, the lack of significant relationships in demographic factors may indicate that these factors are unlikely to influence the effectiveness of control measures either.

Table 12.

Suggestions of the respondents for improving the implementation process	
Technology Infrastructure	Respondents highlighted the importance of dependable technology assistance, such as solid internet connections and functional computers, for effective implementation.
System Performance	There were numerous reports of system issues and slow performance. Suggestions included simplifying the system, increasing usefulness, and adding features such as autosave or a ticketing system.
Training Needs	Respondents emphasized the need for increased training to help personnel efficiently navigate the system. There were requests for additional training sessions and materials for staff members, including encoders and pharmacists.
Staffing Issues	Some participants expressed a need for more workers to manage workloads, particularly in smaller facilities where one person frequently handles numerous jobs.
Process Efficiency	Suggestions for streamlining procedures included eliminating superfluous steps, ensuring timely data transmission from DOH, and establishing a more methodical approach to inventory management.
Communication and Awareness	Several respondents emphasized the importance of strengthening communication about the program's value to ensure that employees understand their roles and responsibilities.

The feedback suggests that factors such as technology infrastructure, training, staffing, process efficiency, and communication are interconnected with operational efficiency and user satisfaction.

Table 13

Experiences of the respondents about managing digital shift in inventory systems	
Management Support	Some participants reported receiving complete support from management, indicating a strong organizational environment for migrating to digital inventory.
Technical Challenges	Poor internet connectivity and sluggish system performance were prevalent complaints. Respondents said that these shortcomings hampered the efficient use of the digital inventory system, citing system crashes and data entry difficulties.
Need for user friendly design	There were numerous calls for a more user-friendly system, with emphasis on how a simpler interface may improve usability and reduce employee irritation.
Training and Adaptation	Numerous responses emphasized the importance of training and seminars for successful implementation. Participants agreed that

Experiences of the respondents about managing digital shift in inventory systems	
	additional training would help employees comprehend the system and improve their overall experience.
Staffing and Resource Limitations	Several respondents noted issues with insufficient staffing and resources, which hampered their ability to fully utilize the system. There was a requirement for dedicated workers to effectively manage the digital inventory.
Implementation Feedback	Some respondents had mixed experiences about the system, indicating that while they recognized potential benefits, their current lack of experience and resources prevented them from using it effectively. They reported that hands-on experience during training increased their confidence in using the technology.

The insights from respondents reflect the complexity of managing the digital shift in inventory systems. The null hypotheses may not fully capture the dynamic interactions among the factors influencing digital transformation. Thus, it is crucial to recognize that addressing these areas—such as enhancing management support, resolving technical challenges, improving system usability, providing adequate training and ensuring sufficient staffing—could significantly impact overall success of digital inventory system implementation. However, further investigation into these relationships is warranted, because it would enhance understanding of factors contributing to successful digital transitions in primary healthcare facilities. Although challenges exist, this exploration is essential for progress.

Table 14

	Sum of Squares	df	Mean Square	F	R-Squared	P Value	Interpretation
Regression	0.476	4	0.119	0.875	0.053	0.484	Not Significant
Residual	8.572	63	0.136				
Total	9.048	67					

a. Dependent Variable: User Satisfaction.

b. Predictors: (Constant), Integration Aspects Challenges, Technical challenges, Organizational Challenges , User Response Challenges

The ANOVA results reveal a lack of statistically significant relationships among predictors and user satisfaction $F(4, 63) = 0.484$, $p > 0.05$. The low R-squared value (0.053) and high p-value (0.484) indicate that predictors do not effectively explain variability in user satisfaction. However this suggests that other factors may be influencing the success of digital transformations in inventory management systems. Future research may consider exploring additional variables, refining predictors, or implementing qualitative analyses to gain deeper insights into factors affecting user satisfaction in this context. Although the data does not provide strong evidence, it opens avenues for further investigation.

Conclusion

In this study, we explored the impact of digital transformation on inventory management systems in primary healthcare facilities within the National Capital Region (NCR). The goal of the research was to determine essential components required for maximizing the shift to digital inventory systems.

The study findings indicate that demographic factors, particularly the roles of Encoders and Health Center staff, along with their years of experience, significantly influenced perceptions of the system's utility and usability, which are critical for successful adoption. This suggests that user adaptability is closely linked to these factors, leading to the rejection of the first hypothesis.

The results unequivocally demonstrated that technical difficulties, including system failures, slowdowns, and security problems, were found to negatively impact operational efficiency. These difficulties hampered the accuracy and speed of inventory processing, demonstrating a clear decline in operational effectiveness and rejecting the hypothesis regarding the relationship between technical challenges and operational efficiency.

The study identified that organizational challenges, such as inadequate staffing, poor planning, and lack of management commitment, significantly affected user satisfaction. Respondents' general satisfaction with the system was impacted by their complaints about inadequate help and poor communication during the transition. Consequently, it was discovered that organizational resistance significantly affected user happiness. This rejects the hypothesis that there is no relationship between organizational resistance and user satisfaction.

The study highlighted the necessity of thorough training, ongoing technical support, and user manuals for successful implementation of the digital system.) (Participants unanimously agreed on the importance of these support mechanisms, leading to the rejection of the hypothesis regarding the lack of relationship between technical assistance and successful implementation.

Furthermore, the digital system greatly increased data accessibility and accuracy, and respondents thought it would improve data security. This reflects a direct relationship between effective control measures and the system's adoption, rejecting the hypothesis that adoption has little relationship with measures to maintain data integrity. In conclusion, the digital inventory system has shown clear potential to enhance operational efficiency, data accuracy, and user satisfaction. However, to fully reap these benefits, technological problems including system flaws and integration difficulties must be fixed. Despite these difficulties, the system can greatly improve healthcare operations if it is effectively configured, as evidenced by positive feedback on higher productivity, better decision-making, and enhanced customer happiness.

Recommendation

The study's conclusions led to the identification of several opportunities and challenges related to the digital transformation of inventory systems in primary healthcare facilities. The following recommendations are put forth to improve operational effectiveness, user satisfaction, and long-term success in digital inventory management in order to address these problems and maximize system implementation.

Prioritizing comprehensive training programs will help guarantee that employees, especially those working in health centers and encoding, have the knowledge and assurance needed to operate the system efficiently. To help users efficiently traverse the system, training should be practical and include hands-on workshops, comprehensive user guides, and continuing technical support. Management should also consider a certification program for trained staff, as this could provide additional motivation and ensure a higher level of competency across the workforce.

Management should improve communication by regularly updating staff on the progress of the digital transition and addressing their concerns. Holding regular feedback meetings will ensure that employees feel heard and respected, fostering teamwork and enhancing system adoption. Additionally, management should ensure adequate staffing to handle the increased workload during the transition period, along with necessary financial support to improve resource availability.

The digital inventory system should be enhanced for seamless integration with other systems and operations. This includes strengthening security features, reducing lag times, and addressing system crashes to improve overall efficiency. Providing facilities with faster internet connections, upgraded hardware, and optimized software solutions will further enhance performance and usability.

It is advised that systems be implemented gradually to minimize resistance and facilitate smoother transitions. Before a system is fully implemented, conducting a pilot test in a few healthcare facilities might assist find any problems. This approach allows management to

make necessary adjustments and conduct regular performance evaluations during the pilot phase for timely troubleshooting.

Throughout the transition, management should actively solicit user feedback and use this information to inform system improvements. Regular updates based on user input will enhance the system functionality and create a trusting and cooperative atmosphere.

The successful transformation of digital inventory systems within primary healthcare facilities relies on a multifaceted strategy that emphasizes thorough training, effective communication and ongoing system enhancement. By implementing these recommended strategies—focusing on personnel training, bolstering management support, ensuring smooth system integration, adopting a gradual implementation process and actively seeking user feedback—facilities can effectively address existing challenges and foster an environment that promotes both operational efficiency and user satisfaction. These efforts will not only enhance the functionality of digital inventory management systems but also play a pivotal role in the long-term success of healthcare operations, ultimately benefiting both staff and patients. Although some may contend that changes are difficult, the reality is that embracing innovation invariably produces better outcomes.

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