

Evaluating the Role of Digital Transformation in Enhancing Inventory Management within Pharmaceutical Supply Chains: A Case Study in a Saudi Public Hospital.

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Introduction

Pharmaceutical supply chains are essential to ensure timely access to medications and maintain patient safety. The integration of digital technologies has become increasingly important in improving supply operations. By automating tracking and ordering systems, digitization helps reduce manual errors and increase responsiveness. This study investigates how adopting digital systems impacts inventory accuracy and performance in government healthcare facilities.

Problem Statement

Several public hospitals in Saudi Arabia still experience challenges in managing drug inventory effectively. These include drug shortages, overstocking, and delays in procurement. A common factor in these inefficiencies is the limited adoption of digital systems for supply chain management.

Research Objectives

- To assess the influence of digital tools on reducing pharmaceutical inventory waste.
- To examine the relationship between digital infrastructure and inventory performance.
- To identify barriers to adopting digital technologies in hospital supply chains.
- To propose actionable strategies for improving inventory control through digitization.

Significance of the Study

- **Academic Contribution:** This study contributes to the body of knowledge in digital healthcare supply chain management.
- **Practical Value:** It provides insights that may support hospital administrators and policymakers in enhancing inventory practices.
- **Beneficiaries:** Hospital logistics managers, pharmacy departments, IT units, and the Ministry of Health can benefit from the study findings.

Research Questions

1. How does the implementation of digital systems impact the accuracy and efficiency of drug inventory management?
2. What is the correlation between digital integration and the responsiveness of supply operations to demand changes?
3. What challenges do public hospitals face in adopting digital solutions within their supply chains?

Research Methodology

Research Design: Qualitative, literature-based

Method: **Systematic** review and thematic analysis of existing academic and industry literature

Data Sources: Peer-reviewed journals, government and organizational reports, WHO guidelines, and case studies from digital healthcare transformation initiatives

Selection Criteria: Studies published between 2018–2025 focusing on digital supply chain systems in healthcare, especially in the Middle East or similar settings

Analysis Method: Thematic content analysis to identify patterns, barriers, and impacts of digital transformation on inventory efficiency.

Study Limitations

- **Geographical Scope:** Limited to a single public healthcare facility

Preliminary References

1. World Health Organization. (2022). *Digital Supply Chain Management in Public Health*.
2. Alshammari, M. (2021). *Pharmaceutical Inventory Challenges in Saudi Arabia*. Saudi Pharmaceutical Journal.
3. Al-Saeed, A. (2019). *Managing Public Hospital Pharmaceutical Stocks in Saudi Arabia*. Arab Journal of Management.