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كلية الإدارة

تخصص الادارة الصحية

عنوان البحث

The Impact of Information Management Strategies on Decision-Making Effectiveness:

A Quantitative Study within the Al-Ahsa Health Cluster, Saudi Arabia

أثر استراتيجيات إدارة المعلومات على فعالية اتخاذ القرار: دراسة كمية في تجمع الأحساء الصحي بالملكة العربية السعودية

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مقدمة | Introduction

The healthcare sector has experienced rapid improvement as a result of the evolving development of advanced information technology, which has led to the generation of a huge volume of data. Healthcare organizations rely on various advanced and widely available data sources, such as Health Information Systems (HIS), Electronic Health Records (EHR), administrative systems, and digital health applications. These systems generate different types of data, including clinical and administrative data. Healthcare organizations must effectively manage and use this data as an organizational asset to enhance healthcare delivery through data-driven decision-making. Recent global assessments show that healthcare systems increasingly struggle with data fragmentation, inconsistent data governance, and limited interoperability, all of which hinder effective decision-making and organizational performance (Weber, Otto, & Österle, 2009). Being a data-driven organization allows healthcare organizations to enhance patient care and remain competitive. It also supports expanding access to healthcare services and efficiently allocating resources (Alotaibi & Federico, 2020). In today's healthcare organizations, data is widely available, but the challenge remains in how to effectively manage the data in a way that allows top management and decision-makers to generate meaningful information and insights. This challenge is consistent with the concept of information overload, where the volume and complexity of data exceed the organization's capacity to process it effectively, leading to delays and reduced decision accuracy (Eppler & Mengis, 2004). To effectively utilize healthcare data for decision-making, organizations require structured approaches to manage and govern information resources.

Information Management Strategies (IMS) provide systematic frameworks, policies, and practices used to manage and govern information resources to support effective decision-making (Alhassan et al., 2016; Mikalef et al., 2020). These strategies play a crucial role in ensuring data quality, accuracy, accessibility, and integrity across healthcare organizations, which are essential for decision-making (Souza et al., 2024). The absence of information management strategies in an organization may affect the outcomes of decision-making in several ways. This may occur as a result of data overload, poor data quality, or limited access to the relevant information at the right time (Singh, Kim, & Tiwana, 2011). Furthermore, in healthcare organizations, the adoption of information management strategies is crucial for several reasons. First, decision-making directly affects the care delivered to patients. It also influences operational efficiency and resource allocation (Souza et al., 2024). This suggests that the presence of multiple data sources without implementing information management strategies is insufficient. Therefore, such strategies play a vital role in determining decision-making outcomes.

Around the world, most healthcare systems are investing in transformation plans to improve healthcare services by adopting new technologies and maximizing the benefits of healthcare data (McKinsey & Company, 2024). In Saudi Arabia, the healthcare sector underwent a significant national healthcare transformation program aimed at transforming the healthcare delivery system through technology and innovation under Saudi Arabia's Vision 2030. The main program initiatives include adopting advanced health information systems, integrating digital platforms, and improving

data quality and accessibility across health clusters, aiming to provide integrated healthcare to everyone.

Al-Ahsa Health Cluster (AHC) is one of the first clusters established as a key pillar of the national healthcare transformation program. AHC serves more than 1.3 million beneficiaries through 65 primary care centers and 11 general hospitals with a total bed capacity of 2,055 beds. AHC generates a huge volume of clinical and non-clinical data and manages complex healthcare organizations that are undergoing digital transformation. Despite these advancements, the effective use of healthcare data remains a major challenge. The gap between data availability and data usability continues to widen, particularly in complex healthcare environments such as integrated health clusters. This gap highlights the need to examine how information management strategies influence decision-making effectiveness within the Al-Ahsa Health Cluster.

مشكلة الدراسة | Problem Statement

Healthcare data has become widely available through multiple digital systems and various health applications. The volume of healthcare data has increased significantly due to technological advancements and ongoing digital transformation initiatives in the healthcare sector (Li et al., 2019). However, the challenge in healthcare organizations is not only the large volume of data but also the diversity of data types and the speed at which data must be processed and managed (Raghupathi & Raghupathi, 2014). Despite the increasing availability of healthcare data, healthcare professionals, decision-makers, and top management often face uncertainty regarding which data sources should be relied upon in decision-making processes. One of the primary challenges they encounter is obtaining accurate, timely, and relevant information to support effective decisions. This challenge becomes more critical in decentralized healthcare environments with limited resources, where effective data-driven decision-making is essential for improving organizational performance and maintaining high-quality healthcare services (Souza et al., 2024). Consequently, inaccurate, unavailable, or unreliable data may negatively affect the quality and effectiveness of decision outcomes. Recent evidence highlights the severity of this issue. According to McKinsey (2024), approximately 70% of digital health transformation initiatives fail to achieve their intended goals due to poor data management and the absence of effective information governance rather than limitations in technology itself.

Information management strategies play a critical role in addressing these challenges by enabling decision-makers to organize, analyze, and utilize data effectively to generate meaningful

insights that support decision-making and improve patient care (Bhati et al., 2023). However, despite the availability of advanced digital systems, many healthcare organizations still lack structured information management strategies that ensure data quality, integration, and accessibility. Weber, Otto, and Österle (2009) emphasize that effective data governance must be tailored to the organizational context, and that the absence of such governance structures leads to inconsistent data quality and weak decision-making a challenge clearly visible in many healthcare systems. This gap between technological capability and the effective utilization of data highlights the need for stronger information management and governance frameworks.

In Saudi Arabia, healthcare transformation initiatives under Vision 2030 emphasize the importance of digital health and data-driven decision-making. However, organizational complexity, multiple health information systems, and increasing data availability require well-structured information management strategies to guide decision-making processes effectively. Previous research has shown that healthcare leaders in Saudi Arabia often face challenges in accessing accurate, unified, and timely data to support managerial decisions (Alharbi et al., 2024). Furthermore, national reports continue to highlight ongoing challenges related to data quality, system interoperability, and information governance across Saudi health clusters. These challenges indicate that the potential value of healthcare data is not yet fully realized within Saudi health clusters.

Al-Ahsa Health Cluster (AHC) is one of the largest and most complex healthcare clusters in Saudi Arabia. Given its size, diversity of services, and advanced digital infrastructure, the gap

between data availability and data usability remains substantial, creating uncertainty regarding the effectiveness of existing information management practices. This gap highlights a critical need to examine how information management strategies influence decision-making effectiveness within the Al-Ahsa Health Cluster.

Therefore, the core problem addressed in this study is the lack of empirical evidence regarding the extent to which information management strategies specifically data quality, accessibility, technology adoption, and system integration affect the effectiveness of managerial decision-making in the Al-Ahsa Health Cluster.

أهمية الدراسة | Significance of the Study

Theoretical significance

This study strengthens theoretical knowledge in the field of Healthcare Administration by examining how information management supports managerial decision-making in healthcare organizations. As digital health systems and health information technologies continue to expand, healthcare organizations now generate large amounts of clinical and administrative data. Managing this data effectively has become essential for supporting accurate, timely, and strategic decisions.

This research also fills an important gap in existing literature. Although Saudi Arabia has made major progress in digital health under Vision 2030, very few studies have explored how healthcare managers use information management strategies to improve decision-making, especially within integrated health clusters such as the Al-Ahsa Health Cluster. By focusing on this setting, the study provides new evidence from a context that has not been widely examined.

In addition, the study introduces a clear theoretical framework that connects information management strategies with key dimensions of data quality (accuracy, availability, and reliability) and links these to decision-making effectiveness. This framework can guide future research in healthcare administration, health information management, and digital health governance by offering a structured way to understand how information practices influence managerial decisions.

Practical Significance

From a practical perspective, this study provides valuable insights for healthcare administrators, managers, and organizational leaders regarding the importance of implementing effective information management strategies to support data-driven decision-making.

The findings of this study may help healthcare organizations identify weaknesses in their current information management practices and improve the management of healthcare data to ensure its accuracy, availability, and reliability. Strengthening these practices can enhance managerial decision-making, organizational performance, and the quality of healthcare services.

In addition, the study may support healthcare policymakers and leaders in understanding the role of information governance and data management in improving administrative decision-making within healthcare organizations.

Finally, this study focuses on the Al-Ahsa Health Cluster, which may provide practical insights that help healthcare administrators within the cluster improve their information management strategies and enhance the effectiveness of organizational decision-making.

أهداف الدراسة | Research Objectives

General Objective:

To examine the impact of information management strategies on decision-making effectiveness within the Al-Ahsa Health Cluster.

Specific Objectives:

To assess the effect of information quality (accuracy and reliability of data) on decision-making effectiveness within the Al-Ahsa Health Cluster.

To evaluate how information accessibility and availability support effective administrative and strategic decision-making among healthcare managers.

To examine the role of health information technology and system integration in improving decision-making processes within the Al-Ahsa Health Cluster.

To provide recommendations for improving information management practices to enhance decision-making effectiveness the Al-Ahsa Health Cluster.

تساؤلات الدراسة | Research Questions

Main Research Question

How do information management strategies influence decision-making effectiveness among administrators and managers within the Al-Ahsa Health Cluster?

Sub-Questions

How does information quality (accuracy and reliability of data) influence decision-making effectiveness among healthcare administrators and managers?

To what extent do information accessibility and availability support effective decision-making in healthcare organizations?

How do health information technologies and system integration contribute to improving managerial decision-making processes within the Al-Ahsa Health Cluster?

What improvements in information management strategies can enhance decision-making effectiveness in the Al-Ahsa Health Cluster?

فروض الدراسة | Hypotheses

Main Hypothesis

H0 (Null Hypothesis): Information management strategies have no significant effect on decision-making effectiveness within the Al-Ahsa Health Cluster.

H1 (Alternative Hypothesis): Information management strategies have a significant effect on decision-making effectiveness within the Al-Ahsa Health Cluster.

Sub-Hypotheses

1. H1a - Data Quality (Accuracy & Reliability):

- H1a0: Data quality (accuracy and reliability) has no significant effect on decision-making effectiveness.
- H1a1: Data quality (accuracy and reliability) has a positive and significant effect on decision-making effectiveness.

2. H1b - Data Accessibility and Availability

- H1b0: Data accessibility and availability have no significant effect on decision-making effectiveness.
- H1b1: Data accessibility and availability have a positive and significant effect on decision-making effectiveness.

3. H1c - Technology Adoption (Health Information Systems)

- H1c0: The adoption of health information systems and related technologies has no significant effect on managerial decision-making effectiveness.
- H1c1: The adoption of health information systems and related technologies has a positive and significant effect on managerial decision-making effectiveness.

4. H1d – Information System Integration

- H1d0: Information system integration has no significant effect on decision-making effectiveness.
- H1d1: Information system integration has a positive and significant effect on decision-making effectiveness.

الدراسات السابقة | Literature Review

Several studies have explored the role of information management strategies, health information systems, and data management practices in enhancing decision-making effectiveness in healthcare and organizational settings. These studies provide a foundation for understanding how structured information management practices can support decision makings and organizational performance.

A study by Qasim, Bataineh, and Abu-Dawwas (2025) examined the impact of information management strategies on decision-making effectiveness in Jordanian private hospitals. The study focused on key dimensions of information management, including data accuracy, accessibility, technology adoption, and information system integration, while also assessing the mediating role of organizational culture. A quantitative approach was used, and structured questionnaires were distributed to healthcare professionals, including hospital administrators, IT staff, and clinical managers. Total 357 valid responses were collected. Data were analyzed using partial least squares (PLS) and structural equation modeling (SEM). The results indicated that effective information management strategies significantly improve decision-making effectiveness, with organizational culture serving as a critical mediator. Although the study provides strong empirical evidence, it was conducted in private hospitals in Jordan, limiting its applicability to the Saudi healthcare context. The current research builds on these findings by examining similar relationships within the Al-Ahsa Health Cluster, which operates under a distinct healthcare system and organizational environment.

A study by Souza, Barros, and Melo (2024) investigated how Management Information Systems (MIS) contribute to the decision-making process in organizations. Through a comprehensive literature review, the study found that MIS improve managerial decision-making by promoting data-driven approaches, strengthening communication, and facilitating collaboration. The authors highlighted the need for evaluating MIS contributions using performance indicators such as speed, precision, and complexity of decision-making. While these findings provide valuable theoretical insights, the study was not conducted in the healthcare sector. The current research extends this work by exploring how MIS practices, as part of broader information management strategies, influence decision-making effectiveness in healthcare organizations, particularly in the Al-Ahsa Health Cluster.

In Saudi Arabia, Alsulaiman et al. (2024) examined the impact of health information systems on medical and pharmaceutical decision-making in government hospitals. Using a cross-sectional design with a sample of healthcare professionals, the study revealed that effective health information systems significantly enhance the accuracy and reliability of data, thereby improving decision-making quality. However, the study focused primarily on clinical and pharmaceutical decisions, leaving a gap regarding administrative and strategic decision-making. This highlights the need for research that evaluates decision-making effectiveness across all managerial levels.

Alfuraydi et al. (2024) assessed data management practices among healthcare professionals in Jeddah public health facilities. The study found that despite the implementation of health information systems, deficiencies in data handling, storage, and usage persisted, limiting the ability of managers to

make evidence-based decisions. These findings underscore the importance of comprehensive information management strategies that ensure data is accurate, integrated, and actionable, supporting timely and effective decision-making across healthcare organizations.

Finally, a systematic review by **Alharbi et al. (2024)** examined healthcare data management practices across Saudi Arabia, emphasizing the role of data quality, coordination, and management competencies in enhancing organizational performance. The review highlighted that effective data management practices are essential for supporting managerial decision-making, particularly in decentralized or complex healthcare systems such as integrated health clusters. This supports the rationale for investigating how information management strategies influence decision-making effectiveness in the Al-Ahsa Health Cluster, which comprises multiple facilities and services operating in an integrated environment.

These studies illustrate that while healthcare organizations in Saudi Arabia are making progress in implementing health information systems and improving data management practices, significant challenges remain in translating these initiatives into effective managerial decision-making. Most previous studies have focused either on clinical or operational decision-making, or on isolated aspects of data management, leaving a gap regarding the comprehensive assessment of information management strategies and their impact on managerial decision-making effectiveness. The current study addresses this gap by examining how multiple dimensions of information management such as data accuracy,

accessibility, technology adoption, system integration, and organizational culture influence decision-making effectiveness within the Al-Ahsa Health Cluster.

المنطقات النظرية للدراسة | Theoretical Framework

Data Management Theory

Data Management Theory explains how organizations collect, store, process, and utilize data to support operational and strategic decisions. Effective data management ensures data quality, accessibility, integration, and governance, which enables organizations to make timely and evidence-based decisions.

Application to this study:

- Data Quality: Ensures healthcare managers base decisions on accurate and reliable data.
- Data Integration: Combines information from EHRs, HIS, and digital applications to provide a comprehensive view.
- Data Accessibility: Ensures decision-makers can access timely and relevant information.
- Data Governance: Establishes policies and accountability for proper data use.

These components form the core dimensions of Information Management Strategies, which are the independent variable in this study.

Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory suggests that an organization's internal resources and capabilities are critical to achieving a competitive advantage and improving performance. Resources that are valuable, rare, inimitable, and non-substitutable can lead to superior organizational outcomes (Barney, 1991).

In this study, information management strategies including data quality, accessibility, technology adoption, and system integration are considered strategic organizational resources. High-quality information and well-integrated information systems provide managers with reliable insights, enabling effective decision-making and improving organizational performance.

Decision-Making Theory

Decision-Making Theory focuses on how managers process information and make choices that affect organizational outcomes. It emphasizes the importance of accurate, timely, and relevant information for rational decision-making (Mintzberg & Simon, 1977).

This study applies Decision-Making Theory by examining how information management practices influence the ability of healthcare administrators to make effective, evidence-based decisions. The theory supports the idea that well-managed information systems enhance the quality of administrative decisions, particularly in complex healthcare environments.

Stakeholder Theory

Stakeholder Theory posits that organizations must consider the needs and expectations of multiple stakeholders including employees, managers, patients, and regulatory authorities to achieve sustainable success (Freeman & Mcvea, 2001).

Healthcare organizations operate in a complex environment with multiple stakeholders, each requiring accurate and timely information for decision-making. By implementing effective information management strategies, healthcare administrators can address stakeholder needs, ensure accountability, and improve decision-making outcomes, aligning with the principles of Stakeholder Theory.

Integration of Theories in the Current Study

The study integrates these theories into a comprehensive conceptual framework:

- Independent Variable: Information Management Strategies
 - Dimensions: Data Quality, Data Accessibility, Technology Adoption, System Integration
- Dependent Variable: Decision-Making Effectiveness
- Theoretical Link:
 - Data Management Theory explains the mechanism through which information practices influence decision-making.

- RBV Theory supports viewing information as a strategic organizational resource.
- Decision-Making Theory clarifies how managers use information to make effective decisions.
- Stakeholder Theory highlights the importance of meeting stakeholder needs through reliable information.

Effective information management practices in healthcare organizations lead to better decision-making effectiveness, which in turn contributes to improved administrative performance and aligns with strategic objectives like those outlined in Saudi Vision 2030.

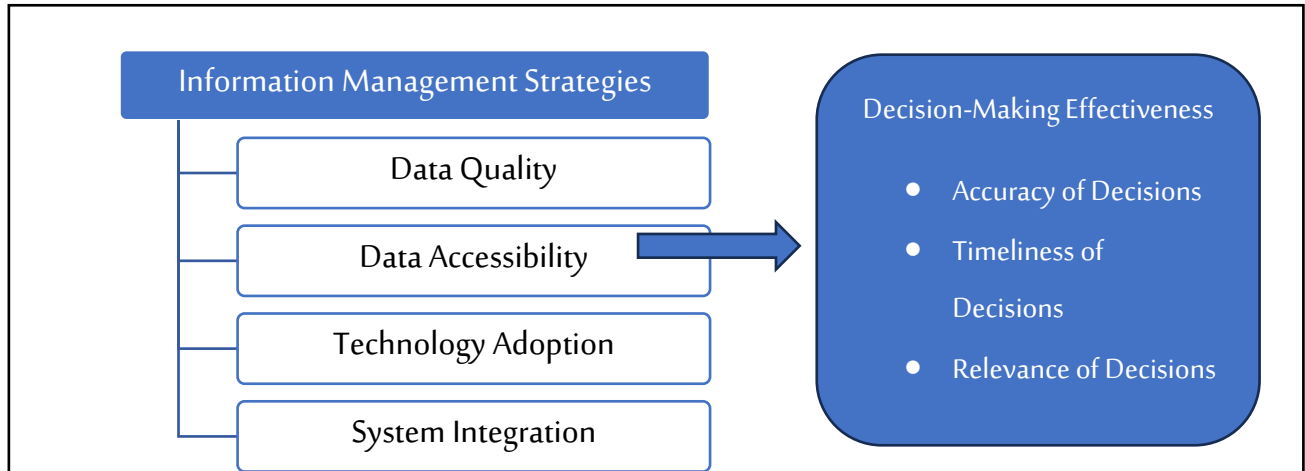


Figure 1: Conceptual Framework of the Study: The Impact of Information Management Strategies on Decision-Making Effectiveness in the Al-Ahsa Health Cluster.

Methodology | المنهجية وطرق البحث

Study Design

This study adopts an explanatory cross-sectional quantitative design to examine the relationship between Information Management Strategies (IMS) and Decision-Making Effectiveness (DME) within the Al Ahsa Health Cluster.

Research Approach

A quantitative approach is used to collect measurable data from healthcare administrators and managers. Data will be gathered using a structured survey questionnaire.

Study Population

The population consists of administrators, IT Staff and managers working within the Al-Ahsa Health Cluster (AHC), including:

- Hospital directors
- Department managers
- Unit supervisors
- IT and HIS administrators
- Decision-support and planning officers

AHC includes 11 hospitals and 65 primary healthcare centers, representing a diverse managerial structure suitable for this study's objectives.

Sampling Method and Sample Size

Sampling Technique: A stratified random sampling method will be used to ensure representation across:

- Managerial levels (senior, middle, operational)
- Departments (clinical, administrative, technical)

This improves the accuracy and generalizability of results.

Sample Size Determination: SPSS-based regression analysis requires an adequate sample for statistical power. Using the common sample-size rule: $N \geq 50 + 8m$. Where m = number of predictors (4 IMS dimensions) Minimum sample = $50 + 8(4) = 82$ participants.

To strengthen reliability and generalizability, the study targets 200–250 respondents from the Al-Ahsa Health Cluster.

Research Plan and Steps of Implementation

The research will be conducted through the following steps:

- Literature review and gap identification
- Definition of variables
- Instrument adaptation
- Pilot testing (20–30 participants)
- Sampling and participant selection



- Data collection
- Data analysis using SPSS
- Interpretation and reporting



أدوات الدراسة | Study Tools

Instrument Source and Adaptation:

The survey instrument was adapted from Qasim et al. (2025), which examined IMS in Jordanian private hospitals. The original questionnaire is published under a Creative Commons Attribution License (CC-BY 4.0), allowing reuse, adaptation, and modification.

For this study:

- Items were adapted to fit the Saudi health sector.
- Items measuring Organizational Culture were removed, as they are not part of the current research model.
- Wording was adjusted to match the structure of AHC and clarify administrative instead of clinical decision-making contexts.

Instrument Structure

The final questionnaire consists of 21 items across five constructs, measured on a 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree):

- Demographic Section (7 items)
- Data Quality (4 items)
- Information Accessibility (4 items)
- Technology Adoption (4 items)

- System Integration (4 items)
- Decision-Making Effectiveness (5 items)

Each construct is operationalized based on validated items from the original study.

Validity and Reliability Procedures

Content Validity: The questionnaire will be reviewed by a panel of experts in healthcare management, information systems, and research methodology to ensure clarity and relevance.

Pilot Testing: A pilot test of 20–30 participants will be conducted to ensure item clarity, response consistency, and survey usability.

Construct Validity: will be assessed through: Exploratory Factor Analysis (EFA), Factor loadings, and KMO and Bartlett's Test

Reliability Testing: Using SPSS, reliability will be measured using: Cronbach's Alpha (acceptable ≥ 0.70)

Data Collection Procedures

- Approval will be obtained from the Al-Ahsa Health Cluster and/or Institutional Review Board.
- The survey will be distributed electronically via secure platforms (email, QR code, or online survey system).
- Participants will provide informed consent before beginning the survey.

- Responses will be collected over a 4–6 week period, with reminder messages sent periodically.
- Data will be screened for completeness, outliers, and missing values before analysis.

Data Analysis Plan

All statistical analyses will be conducted using SPSS.

1. Descriptive Statistics: to measure the frequencies and percentages for demographic variables.

In addition to, means and standard deviations for IMS and DME items

2. Inferential Statistics

- Correlation Analysis: Pearson correlation to assess relationships between IMS dimensions and decision-making effectiveness
- Regression Analysis: Multiple Linear Regression to test the effect of: Data Quality, Information Accessibility, Technology Adoption, and System Integration on Decision-Making Effectiveness
- Regression outputs will include:
 - R^2 value
 - Beta coefficients
 - Significance levels (p-values)
 - Model summary

Ethical Considerations

This study adheres to ethical principles, including:

- Informed consent
- Voluntary participation
- Confidentiality of responses
- No collection of identifiable personal data
- Secure storage of data
- Use of aggregated results only for academic purposes

Ethical approval will be secured before beginning data collection.

حدود الدراسة | Study Limitation

Human Delimitation (Population and Sample)

The study population includes administrators, managers, supervisors, and decision-support staff working in the Al-Ahsa Health Cluster.

The study sample consists of individuals involved in administrative or managerial decision-making within hospitals, primary healthcare centers, and administrative units. A stratified random sampling technique will be used, and the targeted sample size is 200–250 participants, with a minimum required size of 82 respondents based on the common statistical rule.

Spatial Delimitation (Geographical Scope)

The study is limited to the Al-Ahsa Health Cluster located in the Eastern Province of Saudi Arabia.

All data will be collected from healthcare facilities operating under this cluster.

Temporal Delimitation (Time Scope)

Data Collection Period: Data will be collected during the second quarter of 2026.

Study Duration: The overall study covers the period 2025–2026, including preparation, data collection, analysis, and reporting.

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