

Agility as a Strategic Enabler: Unpacking the Digital Transformation–Performance Nexus in Healthcare

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ABSTRACT: Healthcare organizations are undergoing rapid digital transformation (DT), incorporating technologies such as AI, IoT, and telemedicine. However, technological adoption alone does not guarantee improved outcomes. This study investigates the mediating role of organizational agility in the relationship between DT and competitive advantage, aiming to understand how agility enables healthcare institutions to realize the full potential of digital investments. A cross-sectional quantitative design was employed, surveying 250 healthcare professionals from public and private hospitals. Constructs included digital transformation (measured by technology adoption), organizational agility (responsiveness, adaptability), and competitive performance (efficiency, innovation, satisfaction). Data was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), with bootstrapping ($n = 5000$) used to test mediation effects. The results revealed that private hospitals reported higher DT scores (72.3) than public hospitals (56.5). Organizational agility emerged as a significant mediator in the DT–performance relationship. Path coefficients confirmed: $DT \rightarrow Agility$ ($\beta = 0.61$, $p < 0.001$) $Agility \rightarrow Competitive Advantage$ ($\beta = 0.68$, $p < 0.001$) $DT \rightarrow Competitive Advantage$ (Direct: $\beta = 0.29$, Indirect via Agility: $\beta = 0.41$). Agility was found to enhance responsiveness, enable real-time adaptation, and foster innovation. Organizations with higher agility demonstrated superior operational efficiency and patient satisfaction. The findings align with dynamic capabilities theory, which positions agility as essential for navigating digital disruption. Organizational agility is a foundational capability for translating digital transformation into strategic advantage in healthcare. Leaders must invest in agile structures, training, and culture to fully leverage digital tools. This study contributes to the literature by empirically validating agility’s role in digital healthcare strategy and offers a framework for future implementation and evaluation.

Keywords: Digital Transformation, Organizational Agility, Competitive Advantage, Healthcare Innovation, PLS-SEM, Dynamic Capabilities.



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INTRODUCTION

These transformations are particularly salient in healthcare, where operational efficiency, patient outcomes, and strategic decision-making are directly influenced by the capacity to adopt and

integrate technologies such as AI, IoT, and telemedicine. However, while much of the existing literature emphasizes technological adoption, fewer studies address the organizational enablers that allow such technologies to deliver competitive value. This study addresses this gap by focusing on organizational agility as a mediating construct—an area underexplored in healthcare digital transformation literature. Growing patient expectations, the surge in demand for remote healthcare services, and the strategic use of data analytics have all catalyzed a reconfiguration of healthcare delivery systems (Almalki et al., 2024; Rahimi et al., 2023). Technologies such as electronic health records (EHRs), telemedicine platforms, and patient engagement applications are now essential infrastructure components that enable care providers to move toward more integrated, patient-centered models (Hermes et al., 2020; Lemak et al., 2024).

Simultaneously, cutting-edge tools like artificial intelligence (AI), the Internet of Things (IoT), and big data analytics are reshaping diagnostics, treatment personalization, and administrative workflows. These technologies empower organizations to deliver targeted interventions, enhance the continuity of care, and improve resource allocation across facilities (Onyeabor et al., 2023; Rangavittal, 2022). However, the deployment of such technologies is only one facet of transformation. A more nuanced determinant of digital success is the organizational capacity to harness these tools efficiently a concept increasingly associated with organizational agility.

Organizational agility, a prominent construct in strategic management theory, has gained significant traction in the healthcare literature as a critical enabler of digital transformation. Defined as an organization's ability to adapt rapidly to external and internal changes, agility encompasses capabilities such as fast decision-making, responsiveness to fluctuating demands, and structural flexibility (Darmawan & Laksono, 2021; Mataba & Chibaro, 2024). In the healthcare context, agility is not confined to operational adjustments; it extends to innovation in service design, reallocation of human resources, and the empowerment of multidisciplinary teams. Literature consistently emphasizes that a culture of innovation, continuous learning, and decentralized decision-making are essential to cultivating organizational agility (Sharma et al., 2024; Wieslander et al., 2024).

Despite the transformative potential of digital technologies, healthcare institutions face several entrenched challenges that hinder the realization of competitive advantage. These include data security concerns, the complexity of integrating new systems into existing workflows, and the substantial financial outlay required for technology acquisition and implementation (Barbazzeni et al., 2022; Naamati-Schneider et al., 2024). Resistance to change remains prevalent, particularly among clinical staff accustomed to traditional protocols (Kruszyńska-Fischbach et al., 2022). Moreover, discrepancies in technological readiness and resource availability between public and private institutions further complicate the digital maturity landscape (Alfahad et al., 2024; Sepetis et al., 2024).

These sectoral distinctions are particularly pronounced when comparing digital transformation efforts across public and private healthcare providers. Public systems are frequently constrained by regulatory bureaucracy and underfunding, limiting their capacity to rapidly adopt or experiment with new digital tools (Casprini & Palumbo, 2022). In contrast, private providers often exhibit

greater autonomy and access to financial resources, enabling them to pilot and scale digital initiatives with greater agility (Steffen et al., 2023). These differences result in asymmetries in digital health integration and innovation capacity, raising policy implications regarding equity and universal access (Naamati-Schneider et al., 2024).

Within this broader discourse, dynamic capabilities theory provides a compelling explanatory lens for understanding organizational responses to digital disruption. This theoretical framework posits that sustained performance in volatile environments requires the ability to integrate, build, and reconfigure both internal and external competencies (Daril et al., 2024; Raimo et al., 2023). In healthcare, this translates into the capacity to absorb new technologies, support continuous workforce development, and foster strategic partnerships. Collaborations with tech firms, academic institutions, and regulatory bodies are increasingly seen as mechanisms for enhancing organizational learning and accelerating digital assimilation (Correa et al., 2023).

The application of emerging technologies in healthcare further exemplifies this dynamic transformation. AI-driven decision support tools are improving diagnostic accuracy and clinical workflows (Mohammed et al., 2022), while IoT-based monitoring systems offer real-time insights into patient conditions, enabling earlier interventions (Onyeabor et al., 2023). Big data analytics is unlocking new pathways for personalized care through the identification of population-level trends and individual risk profiles (Correa et al., 2023). When strategically aligned with agile management structures, these technologies collectively enhance clinical outcomes and operational effectiveness (Assom et al., 2024).

Nevertheless, the integration of these digital innovations introduces complex challenges. Ensuring data privacy and compliance with legal standards remains paramount to maintaining patient trust (Barbazzeni et al., 2022). Additionally, the interoperability of disparate systems and the digital literacy of healthcare workers are critical factors that influence implementation success (Naamati-Schneider et al., 2024). These issues underscore the importance of a holistic approach that blends technical implementation with human-centered change management.

Importantly, the digitalization of healthcare also necessitates ethical reflection. Questions surrounding equitable access to digital health services, potential algorithmic bias, and the socio-economic determinants of technology use are central to responsible transformation (Eriksen et al., 2023; Litchfield et al., 2021). To ensure inclusive innovation, healthcare organizations must align digital initiatives with ethical frameworks and social accountability principles (Naamati-Schneider et al., 2024).

In conclusion, as the digital transformation of healthcare accelerates, the strategic focus must extend beyond the procurement of advanced technologies. Organizational agility emerges as a decisive factor in determining whether digital initiatives yield sustainable performance improvements. Healthcare leaders must therefore invest in cultivating agile capabilities alongside technological infrastructure to address evolving clinical, operational, and societal demands. This study builds upon the conceptual foundation of dynamic capabilities theory and empirical insights

to explore how agility mediates the relationship between digital transformation and competitive advantage in the healthcare sector.

METHOD

This study employs a quantitative research design to explore the mediating role of organizational agility in the relationship between digital transformation (DT) and competitive advantage within healthcare organizations. The choice of a quantitative approach aligns with the objective to statistically examine the strength and significance of these relationships and to derive empirical insights from perceptual data gathered from healthcare professionals.

A cross-sectional survey methodology was selected for its efficacy in capturing attitudes, perceptions, and reported behaviors at a single point in time. The sample comprised 250 healthcare professionals drawn from both public and private hospitals actively engaged in digital initiatives. Stratified sampling ensured proportional representation of different hospital types, job roles, and geographic regions to enhance generalizability.

The survey instrument was developed based on established constructs from prior research. It employed a 7-point Likert scale ranging from "strongly disagree" to "strongly agree". Constructs included:

- **Digital Transformation (DT):** Measured via indicators such as adoption of AI, IoT, interoperability tools, and electronic health systems.
- **Organizational Agility:** Assessed through adaptability, responsiveness, speed of decision-making, and operational flexibility.
- **Competitive Advantage:** Evaluated using measures of operational efficiency, patient satisfaction, service innovation, and market responsiveness.

The constructs and items were adapted from validated models in strategic management and healthcare IT literature (Hidayah et al., 2020).

Data collection was conducted electronically through secure online forms shared via hospital email lists and professional networks. Anonymity and confidentiality were assured throughout. The process ensured voluntary participation and minimized data duplication. To enhance reliability, stratified sampling was employed and response consistency was checked to reduce bias. A total of 250 complete and valid responses were analyzed, ensuring sample representativeness.

The data was analyzed using SmartPLS 4.0, which supports both measurement and structural modeling. PLS-SEM was selected for its robustness in modeling complex variable relationships, its suitability for predictive modeling, and its ability to handle latent variables with reflective constructs (Becker et al., 2022). It is particularly beneficial for exploratory healthcare research with moderately sized samples (Nasution & Chairunnisa, 2023).

The reliability and validity of the constructs were evaluated through:

- Internal Consistency Reliability: Using Cronbach’s alpha and composite reliability (CR).
- Convergent Validity: Assessed through average variance extracted (AVE).
- Discriminant Validity: Verified using Fornell-Larcker criterion and HTMT ratios.

Path coefficients were computed using bootstrapping with 5000 resamples. The key paths tested were:

- DT → Organizational Agility
- Organizational Agility → Competitive Advantage
- DT → Competitive Advantage (direct and indirect)

The model’s explanatory power was determined using R^2 values, while predictive relevance was assessed via Q^2 statistics.

Rationale for PLS-SEM in Healthcare Research

PLS-SEM is increasingly adopted in health management due to its flexibility, predictive accuracy, and support for theory development (Afthanorhan et al., 2020). It enables researchers to uncover mediating effects and validate complex, multi-level models reflective of the interdependent nature of healthcare systems (Sabol et al., 2023).

RESULT AND DISCUSSION

Digital Transformation Adoption

Hospitals across both public and private sectors have embraced a range of digital technologies, most notably Electronic Health Records (EHRs), telemedicine platforms, AI-driven analytics, and IoT-enabled monitoring systems. EHRs are almost universally implemented to streamline documentation and improve accessibility (Porkodi, 2024). Telemedicine, accelerated by the COVID-19 pandemic, significantly expanded remote care capabilities (Akkaya & Bagieńska, 2022). AI has been integrated for diagnostic support and predictive modeling, while IoT devices support real-time health monitoring (Pajouyan et al., 2019).

Data shows private hospitals demonstrate higher digital maturity than public institutions. For example, private hospitals scored an average DT score of 72.3, compared to 56.5 for public hospitals. This discrepancy aligns with previous findings indicating public sector limitations due to regulatory constraints and funding shortfalls (Al-Kumaim & Alshamsi, 2023).

Table 1. Digital Transformation Adoption by Hospital Type

Hospital Type	AI (%)	IoT (%)	Interoperability (%)	Avg DT Score
Public	48	35	40	56.5
Private	62	52	58	72.3

Organizational Agility and Performance

Hospitals with high agility scores assessed through responsiveness, adaptability, and speed of implementation also reported superior competitive performance. Higher agility enabled timely implementation of digital tools, improved innovation rates, and stronger patient satisfaction scores (Ambay et al., 2022; Holloway, 2024).

Agile organizations reported greater operational efficiency through faster response to patient needs, reduced wait times, and optimized resource deployment (Ahmad & Wasim, 2023). Case studies further validated the agility–performance link. For instance, agile implementation of digital triage systems during the COVID-19 crisis improved emergency response times (Al-jawazneh, 2024).

Table 2. Organizational Agility Index vs Competitive Performance

Hospital ID	Agility Index (0–100)	Competitive Performance Score (0–100)
H001	78	85
H002	62	69
H003	54	61
H004	89	91
H005	47	52

The correlation between organizational agility and competitive performance was statistically significant. For instance, hospitals with agility scores above 75 consistently scored above 80 in performance metrics (e.g., Hospital H004: Agility = 89, Performance = 91). These associations were confirmed through SEM analysis with a path coefficient of $\beta = 0.68$ ($t = 7.15$, $p < 0.001$), underscoring the strength of the mediation.

Mediation Analysis: Agility as a Mediator

Using PLS-SEM, the study confirms the mediating role of organizational agility in the DT–competitive advantage relationship. Bootstrapped estimates showed significant direct and indirect effects:

- DT $\rightarrow$ Agility: $\beta = 0.61$ ($p < 0.001$)
- Agility $\rightarrow$ Performance: $\beta = 0.68$ ($p < 0.001$)

- DT → Performance (Direct): $\beta = 0.29$ ($p = 0.005$)
- Indirect effect via Agility: $\beta = 0.41$

These results confirm that organizational agility significantly mediates the relationship between digital transformation and performance outcomes.

Table 3. Structural Equation Model (SEM) Mediation Results

Path	Coefficient	t-Value	p-Value
DT → Agility	0.61	6.24	<0.001
Agility → Competitive Advantage	0.68	7.15	<0.001
DT → Competitive Advantage (Direct)	0.29	2.85	0.005
Indirect (DT → Agility → Advantage)	0.41		

The findings are consistent with previous literature recognizing agility as a core dynamic capability facilitating effective healthcare transformation (Alhassani & Al-Somali, 2022). The use of SEM and bootstrapping is supported by best practices in mediation analysis for health informatics (Simwita & Helgheim, 2023).

The findings of this study underscore the pivotal role of organizational agility in transforming digital investments into tangible performance gains within healthcare organizations. The significant mediation effect observed between digital transformation and competitive advantage highlights agility not merely as a facilitator but as a core strategic capability. This section interprets these results in light of existing literature and contextualizes their practical and theoretical implications.

Agility enables healthcare providers to effectively bridge the gap between technological adoption and improved organizational performance. The data revealed that private hospitals, often endowed with more flexible resources and governance, showed higher levels of both digital maturity and organizational agility. In contrast, public hospitals, constrained by bureaucracy and funding limitations, lagged behind, underscoring the importance of organizational context in shaping the efficacy of digital strategies.

Structurally, agile organizations tend to employ decentralized decision-making, cross-functional teams, and flexible hierarchies designs that allow them to respond quickly to environmental shifts and evolving patient demands (Akkaya et al., 2024; Alotaibi & Almudhi, 2023). These structures dismantle silos, improve collaboration, and support real-time problem-solving, thereby enhancing overall responsiveness and resilience.

Leadership plays an equally critical role. Agile cultures are cultivated through inclusive leadership practices that emphasize transparency, open communication, and continuous learning (Kim & Lee, 2020). Leaders who model agility by being adaptable and results-focused encourage a ripple effect throughout the organization, fostering a collective mindset attuned to change (Yamin & Murwaningsari, 2023).

These patterns also emerge in global contexts. For example, performance disparities between public and private hospitals observed in this study echo findings from other systems. Scandinavian models, known for integrated public data platforms, contrast with market-responsive agility found in U.S. hospitals. Such international insights reinforce the importance of context-sensitive agility frameworks.

Failing to embed agility into digital transformation strategies poses substantial risks. Inflexible organizations are often unable to keep pace with technological change, resulting in delayed decision-making, employee disengagement, and suboptimal service delivery (Falla & Karwowski, 2024). Furthermore, misaligned or poorly executed digital initiatives can lead to inefficient resource use and failure to achieve desired performance improvements (Moraga-Díaz et al., 2023).

Cross-national comparisons provide further insight into how agility is operationalized in different healthcare systems. Scandinavian countries exemplify public sector agility through integrated data systems and stakeholder-driven governance, while the U.S. model showcases the impact of market-driven agility across varied institutional settings (Akkaya & Mert, 2022). Additionally, cultural factors such as continuous learning and empowerment have been shown to enhance agility and transformation success globally (Joel et al., 2024).

In sum, this study affirms that agility is not a peripheral feature but a central determinant of success in digital healthcare transformation. Its influence is both structural and cultural, requiring alignment of leadership behaviors, team dynamics, and organizational architecture. For healthcare institutions seeking to thrive in an increasingly digital and unpredictable environment, fostering agility must be a deliberate and sustained strategic priority.

CONCLUSION

This study examined the mediating role of organizational agility in the relationship between digital transformation and competitive advantage in the healthcare sector. The findings reveal that while digital technologies are essential enablers, their impact is significantly amplified when healthcare organizations possess agile capabilities. Agility allows institutions to adapt rapidly, innovate effectively, and optimize operations in response to dynamic healthcare demands. The empirical analysis using PLS-SEM confirms that agility is a critical dynamic capability, serving as a strategic conduit through which digital initiatives translate into performance improvements.

From a practical perspective, the study emphasizes the importance of integrating agile structures, decentralized leadership, and continuous learning into digital transformation efforts. Without agility, digital investments risk inefficiency and limited long-term value. The study contributes to the theoretical development of dynamic capabilities in healthcare and offers actionable insights for policymakers and leaders aiming to build resilient, tech-enabled healthcare systems. Future research should explore longitudinal effects and cross-cultural variations to deepen understanding of how agility evolves within diverse health ecosystems.

REFERENCE

- Afthanorhan, A., Awang, Z., & Aimran, N. (2020). Five Common Mistakes for Using Partial Least Squares Path Modeling (PLS-PM) in Management Research. *Contemporary Management Research*, 16(4), 255–278. <https://doi.org/10.7903/cmr.20247>
- Ahmad, S., & Wasim, S. (2023). AGILE Methodology in Healthcare and Medical Practices: A Narrative Review. *Scholars International Journal of Chemistry and Material Sciences*, 6(08), 129–133. <https://doi.org/10.36348/sijtcm.2023.v06i08.002>
- Akkaya, B., & Bagieńska, A. (2022). What Is the Relationship Between Agile Capabilities and Innovation Process? <https://doi.org/10.3846/bm.2022.880>
- Akkaya, B., & Mert, G. (2022). Organizational Agility, Competitive Capabilities, and the Performance of Health Care Organizations During the Covid-19 Pandemic. *Central European Management Journal*, 30(2), 2–25. <https://doi.org/10.7206/cemj.2658-0845.73>
- Akkaya, B., Popescu, C., Apostu, S. A., Bagieńska, A., & Üstgörül, S. (2024). The Role of Leader Nurse Managers in Organizational Agility and Innovation in Perspective of Job Satisfaction: An Empirical Study in Healthcare Organizations. <https://doi.org/10.21203/rs.3.rs-3829297/v1>
- Alfahad, A. H., Alabbas, Y. S., Alabbas, H. S. M., Abukhashbah, T. H., Alabdali, A. A., Alfatieh, Q. M. H., Bashawri, E. A., Hadidi, H., Junaid, R. M. A., & Alhazmi, K. (2024). Evaluating the Impact of Saudi Vision 2030 on Healthcare Investment: A Comprehensive Review of Progress and Future Directions. *Journal of Ecohumanism*, 3(8). <https://doi.org/10.62754/joe.v3i8.4774>
- Alhassani, A., & Al-Somali, S. A. (2022). Impact of Dynamic Innovation Capabilities on Organizational Agility and Performance in Saudi Public Hospitals. *Journal on Innovation and Sustainability Risus*, 13(1), 44–59. <https://doi.org/10.23925/2179-3565.2022v13i1p44-59>
- Al-jawazneh, B. E. (2024). The Mediating Role of Supply Chain Digitization in the Relationship Between Supply Chain Agility and Operational Performance. *Uncertain Supply Chain Management*, 12(2), 669–684. <https://doi.org/10.5267/j.uscm.2024.1.017>
- Al-Kumaim, N. H. & Sultan Khalifa Humaid Khalifa Alshamsi. (2023). Determinants of Cyberattack Prevention in UAE Financial Organizations: Assessing the Mediating Role of Cybersecurity Leadership. *Applied Sciences*, 13(10), 5839. <https://doi.org/10.3390/app13105839>
- Almalki, S. s., Alhomiany, A. M., Alsharif, M. Z., Alsolomany, F. J. A., Alnajjar, M. M. a., AlSharif, M. H., Al-Talhi, S. O., Alosaimi, S. M. O., Albaqami, S. M. K., & Alsulaimani, M. A. A.

- (2024). Transforming Healthcare Through Effective Health Administration Practices: A Systematic Review. *Journal of Ecohumanism*, 3(7). <https://doi.org/10.62754/joe.v3i7.4670>
- Alotaibi, F. S., & Almudhi, R. (2023). Application of Agile Methodology in Managing the Healthcare Sector. *Irasd Journal of Management*, 5(3), 147–160. <https://doi.org/10.52131/jom.2023.0503.0114>
- Ambay, R. S., Jabbari, K. M., Goel, P., Patel, S. V., & Kedar, R. P. (2022). Improving Operational Efficiency in Radiology Using Artificial Intelligence. *Journal of Healthcare Management Standards*, 2(1), 1–9. <https://doi.org/10.4018/jhms.315617>
- Assom, L., Karunaratne, T., & Larsson, A. (2024). Harmonizing Patient-Centric Requirements for Secure Digital Health Services in Hetero-Genecous Settings. <https://doi.org/10.21203/rs.3.rs-4991954/v1>
- Barbazzeni, B., Haider, S., & Friebe, M. (2022). Engaging Through Awareness: Purpose-Driven Framework Development to Evaluate and Develop Future Business Strategies With Exponential Technologies Toward Healthcare Democratization. *Frontiers in Public Health*, 10. <https://doi.org/10.3389/fpubh.2022.851380>
- Becker, J.-M., Cheah, J., Gholamzade, R., Ringle, C. M., & Sarstedt, M. (2022). PLS-SEM's Most Wanted Guidance. *International Journal of Contemporary Hospitality Management*, 35(1), 321–346. <https://doi.org/10.1108/ijchm-04-2022-0474>
- Casprini, E., & Palumbo, R. (2022). Reaping the Benefits of Digital Transformation Through Public-Private Partnership: A Service Ecosystem View Applied to Healthcare. *Global Public Policy and Governance*, 2(4), 453–476. <https://doi.org/10.1007/s43508-022-00056-9>
- Correa, E. d. S., Sátyro, W. C., Silva, L. F. d., Martens, M. L., & Contador, J. C. (2023). Healthcare 4.0 Implementation: Opportunities and Challenges in the Healthcare Sector. *Peer Review*, 5(15), 163–182. <https://doi.org/10.53660/749.prw1933>
- Daril, M. A. M., Fatima, F., Talpur, S. R., & Abbas, A. F. (2024). Unveiling the Landscape of Big Data Analytics in Healthcare: A Comprehensive Bibliometric Analysis. *International Journal of Online and Biomedical Engineering (Ijoe)*, 20(06), 4–24. <https://doi.org/10.3991/ijoe.v20i06.48085>
- Darmawan, E. S., & Laksono, S. (2021). The New Leadership Paradigm in Digital Health and Its Relations to Hospital Services. *Jurnal Ilmu Kesehatan Masyarakat*, 12(2), 89–103. <https://doi.org/10.26553/jikm.2021.12.2.89-103>
- Eriksen, J., Ebbesen, M., Tornbjerg, K., Hjermitsev, C. B., Knudsen, C., Bertelsen, P., Nøhr, C., & Weber, D. (2023). Equity in Digital Healthcare – The Case of Denmark. *Frontiers in Public Health*, 11. <https://doi.org/10.3389/fpubh.2023.1225222>

- Falla, J. F. S., & Karwowski, W. (2024). Survey-Based Studies of the Agility Construct in the Healthcare Sector: A Systematic Literature Review. *Applied Sciences*, 14(3), 1097. <https://doi.org/10.3390/app14031097>
- Hermes, S., Riasanow, T., Clemons, E. K., Böhm, M., & Krcmar, H. (2020). The Digital Transformation of the Healthcare Industry: Exploring the Rise of Emerging Platform Ecosystems and Their Influence on the Role of Patients. *Bur - Business Research*, 13(3), 1033–1069. <https://doi.org/10.1007/s40685-020-00125-x>
- Hidayah, N., Fetrina, E., & Taufan, A. Z. (2020). Model Satisfaction Users Measurement of Academic Information System Using End-User Computing Satisfaction (EUCS) Method. *Applied Information System and Management (Aism)*, 3(2), 119–123. <https://doi.org/10.15408/aism.v3i2.14516>
- Holloway, S. (2024). Exploring the Impact of Real-Time Supply Chain Information on Marketing Decisions: Insights From Service Industries. <https://doi.org/10.20944/preprints202406.1500.v1>
- Joel, O. S., Oyewole, A. T., Odunaiya, O. G., & Soyombo, O. T. (2024). Navigating the Digital Transformation Journey: Strategies for Startup Growth and Innovation in the Digital Era. *International Journal of Management & Entrepreneurship Research*, 6(3), 697–706. <https://doi.org/10.51594/ijmer.v6i3.881>
- Kim, Y., & Lee, E. (2020). The Relationship Between the Perception of Open Disclosure of Patient Safety Incidents, Perception of Patient Safety Culture, and Ethical Awareness in Nurses. *BMC Medical Ethics*, 21(1). <https://doi.org/10.1186/s12910-020-00546-7>
- Kruszyńska-Fischbach, A., Sysko-Romańczuk, S., Napiórkowski, T. M., Napiórkowska, A., & Kozakiewicz, D. (2022). Organizational E-Health Readiness: How to Prepare the Primary Healthcare Providers' Services for Digital Transformation. *International Journal of Environmental Research and Public Health*, 19(7), 3973. <https://doi.org/10.3390/ijerph19073973>
- Lemak, C. H., Pena, D., Jones, D. A., Kim, D. H., & Gupta, J. (2024). Leadership to Accelerate Healthcare's Digital Transformation: Evidence From 33 Health Systems. *Journal of Healthcare Management*, 69(4), 267–279. <https://doi.org/10.1097/jhm-d-23-00210>
- Litchfield, I., Shukla, D., & Greenfield, S. (2021). Impact of COVID-19 on the Digital Divide: A Rapid Review. *BMJ Open*, 11(10), e053440. <https://doi.org/10.1136/bmjopen-2021-053440>
- Mataba, A. T., & Chibaro, M. (2024). The Effects of Digital Transformation on Healthcare Business Models in Zimbabwe: Perceptions and Implications. *European Journal of Information and Knowledge Management*, 3(3), 57–78. <https://doi.org/10.47941/ejkm.2220>

- Mohammed, M., Shafiq, N., Al-Mekhlafi, A. A., Rashed, E. F., Khalil, M. H., Zawawi, N. A. W. A., Muhammad, A., & Sadis, A. M. (2022). The Mediating Role of Policy-Related Factors in the Relationship Between Practice of Waste Generation and Sustainable Construction Waste Minimisation: PLS-SEM. *Sustainability*, 14(2), 656. <https://doi.org/10.3390/su14020656>
- Moraga-Díaz, R., Leiva-Araos, A., & García, J. (2023). A Robust Statistical Methodology for Measuring Enterprise Agility. *Applied Sciences*, 13(14), 8445. <https://doi.org/10.3390/app13148445>
- Naamati-Schneider, L., Arazi-Fadlon, M., & Daphna–Tekoah, S. (2024). Navigating Moral and Ethical Dilemmas in Digital Transformation Processes Within Healthcare Organizations. *Digital Health*, 10. <https://doi.org/10.1177/20552076241260416>
- Nasution, S. W., & Chairunnisa, C. (2023). Hospital Management Information System Implementation Assessment Using HOT-FIT Model in Langsa General Hospital Aceh, Indonesia. *Majalah Kedokteran Bandung*, 55(1). <https://doi.org/10.15395/mkb.v55n1.280>
- Onyeabor, U. S., Ayoola, L. O., Okenwa, W. O., Onwuasoigwe, O., Schaaf, T., Pinkwart, N., & Balzer, F. (2023). Assessment of Readiness Across Tertiary/University Teaching Hospitals in a Developing Country Nigeria to Implement Sustainable Healthcare Digital Transformation Programmes and Projects. <https://doi.org/10.21203/rs.3.rs-3293907/v1>
- Pajouyhan, A., Rezaei, B., & Parno, M. (2019). The Relationship of the Components of Emotional Intelligence With Organizational Agility in the Healthcare Network. *Journal of Kermanshah University of Medical Sciences*, In Press(In Press). <https://doi.org/10.5812/jkums.86873>
- Porkodi, S. (2024). The Effectiveness of Agile Leadership in Practice: A Comprehensive Meta-Analysis of Empirical Studies on Organizational Outcomes. *Journal of Entrepreneurship Management and Innovation*, 20(2), 117–138. <https://doi.org/10.7341/20242026>
- Rahimi, N. I. M., Yatya, S. M., & Bakar, N. A. A. (2023). Enterprise Architecture: Enabling Digital Transformation for Healthcare Organization. *Open International Journal of Informatics*, 11(1), 67–73. <https://doi.org/10.11113/oiji2023.11n1.246>
- Raimo, N., Turi, I. D., Albergo, F., & Vitolla, F. (2023). The Drivers of the Digital Transformation in the Healthcare Industry: An Empirical Analysis in Italian Hospitals. *Technovation*, 121, 102558. <https://doi.org/10.1016/j.technovation.2022.102558>
- Rangavittal, P. B. (2022). Evolving Role of AI in Enhancing Patient Care Within Digital Health Platforms. *Design of Single Chip Microcomputer Control System for Stepping Motor*, 1–6. [https://doi.org/10.47363/jaicc/2022\(1\)241](https://doi.org/10.47363/jaicc/2022(1)241)
- Sabol, M. A., Hair, J. F., Cepeda-Carrión, G., Roldán, J. L., & Chong, A. Y. (2023). PLS-SEM in Information Systems: Seizing the Opportunity and Marching Ahead Full Speed to Adopt

- Methodological Updates. *Industrial Management & Data Systems*, 123(12), 2997–3017. <https://doi.org/10.1108/imds-07-2023-0429>
- Sepetis, A., Georgantas, K., & Nikolaou, I. E. (2024). Innovative Strategies for Bio-Waste Collection in Major Cities During the COVID-19 Pandemic: A Comprehensive Model for Sustainable Cities—The City of Athens Experience. *Urban Science*, 8(3), 80. <https://doi.org/10.3390/urbansci8030080>
- Sharma, V., Jamwal, A., Agrawal, R., & Pratap, S. (2024). A Review on Digital Transformation in Healthcare Waste Management: Applications, Research Trends and Implications. *Waste Management & Research the Journal for a Sustainable Circular Economy*, 43(6), 828–849. <https://doi.org/10.1177/0734242x241285420>
- Simwita, Y., & Helgheim, B. I. (2023). Application of Agile and Simulation Approaches for the Maximal Benefits of Reduced Turnaround Time From the Point of Care Testing. *Tanzania Journal of Science*, 49(2), 468–478. <https://doi.org/10.4314/tjs.v49i2.17>
- Wieslander, L., Bäckström, I., & Häggström, M. (2024). Participation in the Digital Transformation of Healthcare: A Review of Qualitative Studies. *International Journal of Health Care Quality Assurance*, 37(3/4), 68–84. <https://doi.org/10.1108/ijhcqa-03-2024-0021>
- Yamin, T., & Murwaningsari, E. (2023). Exploring the Interplay Between Digital Technology, Transformational Leadership and Agility for Enhancing Organisational Performance. *Business Ethics and Leadership*, 7(4), 73–88. [https://doi.org/10.61093/bel.7\(4\).73-88.2023](https://doi.org/10.61093/bel.7(4).73-88.2023)