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Service Innovation and Hospital Performance: A CIMO-Based Systematic Literature Review

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Abstract

Background: Hospitals face increasing pressure to improve patient experience, quality of care, operational efficiency, and financial sustainability. However, evidence linking service innovation to hospital performance remains fragmented.
Objective: To synthesize reported associations and proposed mechanisms linking service innovation to multidimensional hospital performance using the Context–Intervention–Mechanism–Outcome (CIMO) framework.
Methods: This systematic review searched Scopus, ProQuest, ScienceDirect, and PubMed for English-language, open-access empirical journal articles published between 2020 and 2025. Eligible studies examined service innovation in hospital or healthcare settings and its performance-related outcomes, while selected cross-sector studies were used solely to inform the interpretation of underlying mechanisms. The PRISMA 2020 guidelines informed the reporting process, while CIMO coding supported a narrative thematic synthesis rather than a meta-analysis.
Results: Five pathways were identified: patient value, operational value, digital value, collaborative value, and strategic value. Reported outcomes included patient satisfaction, patient loyalty, financial performance, operational coordination, information quality, innovation performance, and competitiveness. Proposed mechanisms included information quality, workflow redesign, leadership, organizational readiness, absorptive capacity, trust, and strategic alignment. The predominance of cross-sectional research designs limits causal inference. Furthermore, inaccessible full-text reports and incomplete documentation of the search and appraisal processes constrain the interpretation of the findings.
Conclusion: Service innovation is associated with hospital performance through context-dependent pathways rather than producing guaranteed improvements. The CIMO framework provides a structured account of plausible mechanisms that warrant empirical testing.

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INTRODUCTION

Hospitals increasingly operate under complex performance pressures that require simultaneous improvements in clinical quality, patient safety, patient experience, operational efficiency, financial sustainability, and organizational adaptability (Alolayyan et al., 2020; Yuliaty et al., 2025). Contemporary hospital performance cannot be reduced to a single financial indicator because hospitals must demonstrate measurable outcomes across service quality, care coordination, information quality, patient satisfaction, staff performance, innovation capability, and strategic competitiveness (Dąbrowski et al., 2025; Hügle & Grek, 2023; Moreno-Domínguez et al., 2024). These multidimensional pressures require hospitals to redesign service processes, strengthen digital infrastructure, integrate knowledge, and develop adaptive organizational routines (Glover et al., 2020; Leedham-Green et al., 2021; van den Hoed et al., 2022).

Within this landscape, service innovation has emerged as a strategic mechanism through which hospitals renew the design, delivery, coordination, evaluation, and patient experience of healthcare services (Chaudhuri et al., 2023; Fahmi et al., 2020; Yeboah & Amponsah, 2025). Service innovation in hospitals is not confined to technology adoption; it also encompasses process redesign, service program innovation, patient-centered service delivery, open innovation, co-creation, and new forms of clinical-managerial collaboration (Dąbrowski et al., 2025; He et al., 2022; Krychowski & Tézenas du Montcel, 2025). It should therefore be understood as an organizational capability that integrates resources, knowledge, technology, leadership, and stakeholder interactions to create superior service value (Akinwale & AboAlsamh, 2023; Chaudhuri et al., 2023).

Prior evidence suggests that service innovation is associated with hospital performance through patient satisfaction, loyalty, financial performance, competitiveness, operational efficiency, and information-enabled service quality (Alolayyan et al., 2020; Dąbrowski et al., 2025; Fahmi et al., 2020). However, the evidence is inconsistent: some studies demonstrate positive effects on patient-related or financial outcomes, whereas others find that innovation does not automatically produce such effects when service quality, patient engagement, competitiveness, or organizational readiness is inadequate (Leedham-Green et al., 2021; Yeboah & Amponsah, 2025; Yuliaty et al., 2025). This suggests that the relationship between service innovation and hospital performance is mediated and conditioned by organizational mechanisms rather than explained by simple direct effects (Dąbrowski et al., 2025; He et al., 2022). These differences should be interpreted in light of four sources of heterogeneity: hospital and country contexts, cross-sectional surveys versus implementation evaluations, digital versus process-based or collaborative innovation, and patient-reported versus financial or organizational outcomes. These dimensions offer plausible explanations for divergent findings; however, the supplied extraction data do not permit their independent effects to be distinguished.

Digital transformation further expands the scope of service innovation, as health information technology, electronic medical records, telemedicine, analytics, and digital platforms increasingly shape how hospitals organize and measure service delivery (Akinwale & AboAlsamh, 2023; Alolayyan et al., 2020; Hügle & Grek, 2023). Digital service innovation may be associated with improved performance when technology adoption is supported by information quality, workflow integration, digital competence, and strategic performance measurement (Alolayyan et al., 2020; Hügle & Grek, 2023; Moreno-Domínguez et al., 2024). Technology should therefore be regarded as enabling infrastructure rather than as innovation itself (Akinwale & AboAlsamh, 2023; Mollah et al., 2024; Yuliaty et al., 2025).

A second stream of evidence indicates that service innovation in healthcare is increasingly collaborative, as hospitals depend on external knowledge, clinical expertise, technology partners, interorganizational trust, and patient-oriented value co-creation (Chaudhuri et al., 2023; He et al., 2022; Huynh, 2025). Innovations involving healthcare-related 3D printing, open innovation, and university-hospital-industry collaboration indicate that performance gains require resource orchestration across organizational boundaries rather than isolated internal projects (Chaudhuri et al., 2023; Huynh, 2025; Krychowski & Tézenas du Montcel, 2025). This implies that hospitals must govern the social, technical, and relational conditions under which service innovation is adopted and sustained (He et al., 2022; Leedham-Green et al., 2021).

Despite this growing body of evidence, the literature remains fragmented across innovation types, theoretical lenses, research methods, contexts, and performance indicators (Alolayyan et al., 2020; Dąbrowski et al., 2025; Leedham-Green et al., 2021; Yeboah & Amponsah, 2025; Zada et al., 2025). This fragmentation creates a need for a synthesis that clarifies how service innovation relates to hospital performance, through which mechanisms this relationship operates, and under what conditions these mechanisms are effective (Chaudhuri et al., 2023; Yuliaty et al., 2025).

Four critical gaps remain insufficiently addressed. First, conceptual fragmentation: service innovation has been examined through disconnected lenses, including health information technology, service quality redesign, open innovation, digital transformation, and co-creation, without an integrated framework explaining how these forms relate to hospital performance. This fragmentation limits cumulative theory development (Alolayyan et al., 2020; Chaudhuri et al., 2023; Dąbrowski et al., 2025; Hügle & Grek, 2023). Second, mechanism under-specification: performance effects are often assumed to operate through information quality, patient value creation, workflow redesign, knowledge integration, trust, absorptive capacity, leadership, and organizational readiness. However, these mechanisms are rarely modeled or synthesized explicitly, creating a risk that service innovation will be treated as a direct rather than a mediated determinant of hospital performance (Alolayyan et al., 2020; Dąbrowski et al., 2025; He et al., 2022; Yuliaty et al., 2025). Third, methodological limitations: much of the available evidence relies on cross-sectional surveys, perceptual measures, and single-country samples, limiting causal inference and cross-study comparability while restricting understanding of how innovation is adopted, routinized, and sustained (Dąbrowski et al., 2025; Glover et al., 2020; Leedham-Green et al., 2021; Yeboah & Amponsah, 2025). Fourth, hospital-context specificity: much of the broader service innovation literature is derived from hospitality, tourism, banking, small and medium-sized enterprises (SMEs), and public administration. Its findings cannot be transferred directly to hospitals, which are distinctive professional service organizations shaped by clinical risk, patient safety, professional autonomy, and regulatory constraints (Harif et al., 2022; Ibrahim et al., 2022; Pusparani et al., 2023; Wang et al., 2024).

The gaps identified above are interpretive observations drawn from the literature discussed in this Introduction rather than findings from a separately documented review of reviews. The present synthesis uses the Context-Intervention-Mechanism-Outcome (CIMO) framework to organize hospital contexts, innovation interventions, proposed mechanisms, and multidimensional outcomes. The five pathways provide an explanatory structure for the reported associations; they do not establish how causal effects are produced. The comparison with bibliometric mapping therefore reflects a distinction in analytical purpose rather than evidence that previous reviews have omitted all mechanisms.

Accordingly, this review addresses three research questions. RQ1 maps intervention and mechanism codes to the five value pathways; RQ2 maps context and evidence-role codes to boundary conditions and transferability; and RQ3 maps outcome codes to the subjected performance dimensions. These mappings guide interpretation rather than the quantitative ranking of evidence.

Guided by the CIMO framework, this review distinguishes among core hospital evidence, healthcare-related evidence, and cross-sector mechanism evidence. Its contribution lies in integrating these evidence roles with five value pathways and multidimensional performance outcomes. The cited review of hospital performance employs bibliometric mapping (Eni et al., 2026), whereas the present review uses narrative-thematic CIMO coding of empirical studies retrieved from four databases covering the period from 2020 to 2025. A verified comparison of the databases, search periods, and analytical procedures used in other reviews is not available in the supplied material; therefore, no claim of comprehensive or exclusive novelty is made.

METHOD

This study employed a qualitative systematic literature review guided by the Context–Intervention–Mechanism–Outcome (CIMO) framework. The included articles were examined as qualitative evidence sources, with relevant findings coded according to contextual conditions, service innovation interventions, proposed mechanisms, and performance outcomes. The synthesis combined deductive CIMO categories with inductively identified themes, drawing on the principles of thematic analysis (Ahmed et al., 2025; Braun & Clarke, 2006). The review was reported to have followed a predefined protocol covering the research objectives, database selection, publication period, eligibility criteria, screening procedures, methodological appraisal, and synthesis approach. However, the protocol was not registered, and neither a dated protocol document nor an amendment history was available for independent verification. Consequently, the prospective specification of the review procedures could not be confirmed. PRISMA 2020 Page et al. (2022) was used as a reporting guideline for study identification and selection, whereas CIMO coding and narrative-thematic synthesis constituted the analytical approach.

The reported literature searches were conducted across Scopus, ProQuest, ScienceDirect, and PubMed for publications from 2020 to 2025. The search strategy focused on service innovation and hospital-related performance, with restrictions concerning publication language, access status, and document type. The reported Scopus query was TITLE-ABS-KEY("service innovation") AND TITLE-ABS-KEY("hospital"), yielding 100 records. For ProQuest, ScienceDirect, and PubMed, the reported search expression was "service innovation" AND "hospital performance," yielding 67, 41, and 3 records, respectively. The combined initial retrieval comprised 211 records. Because the original database-specific search logs, execution dates, and complete database-specific search translations are unavailable, the precise implementation and timing of the restrictions cannot be independently established. Accordingly, these figures are retained as reported retrieval counts rather than as independently reproduced search results.

Studies were included if they were empirical (quantitative, qualitative, or mixed-methods) journal articles published in English, examined service innovation or closely related forms of innovation, were situated in hospital or healthcare contexts, reported at least one performance-related outcome, and had accessible full texts. Studies conducted outside the hospital sector were retained only when they provided relevant evidence concerning mechanisms (e.g., co-creation and open innovation). Nonempirical works, including editorials, conceptual papers, and systematic reviews, were excluded.

The database-specific queries differed in breadth: searching for "hospital" and "hospital performance" does not necessarily retrieve equivalent records. Applying common eligibility criteria supports consistency in study selection but does not establish equivalent retrieval sensitivity or search completeness. No benchmark set, recall assessment, or supplementary search log was available in the supplied material. Consequently, conceptual consistency rests on the stated eligibility criteria, while incomplete retrieval remains a limitation.

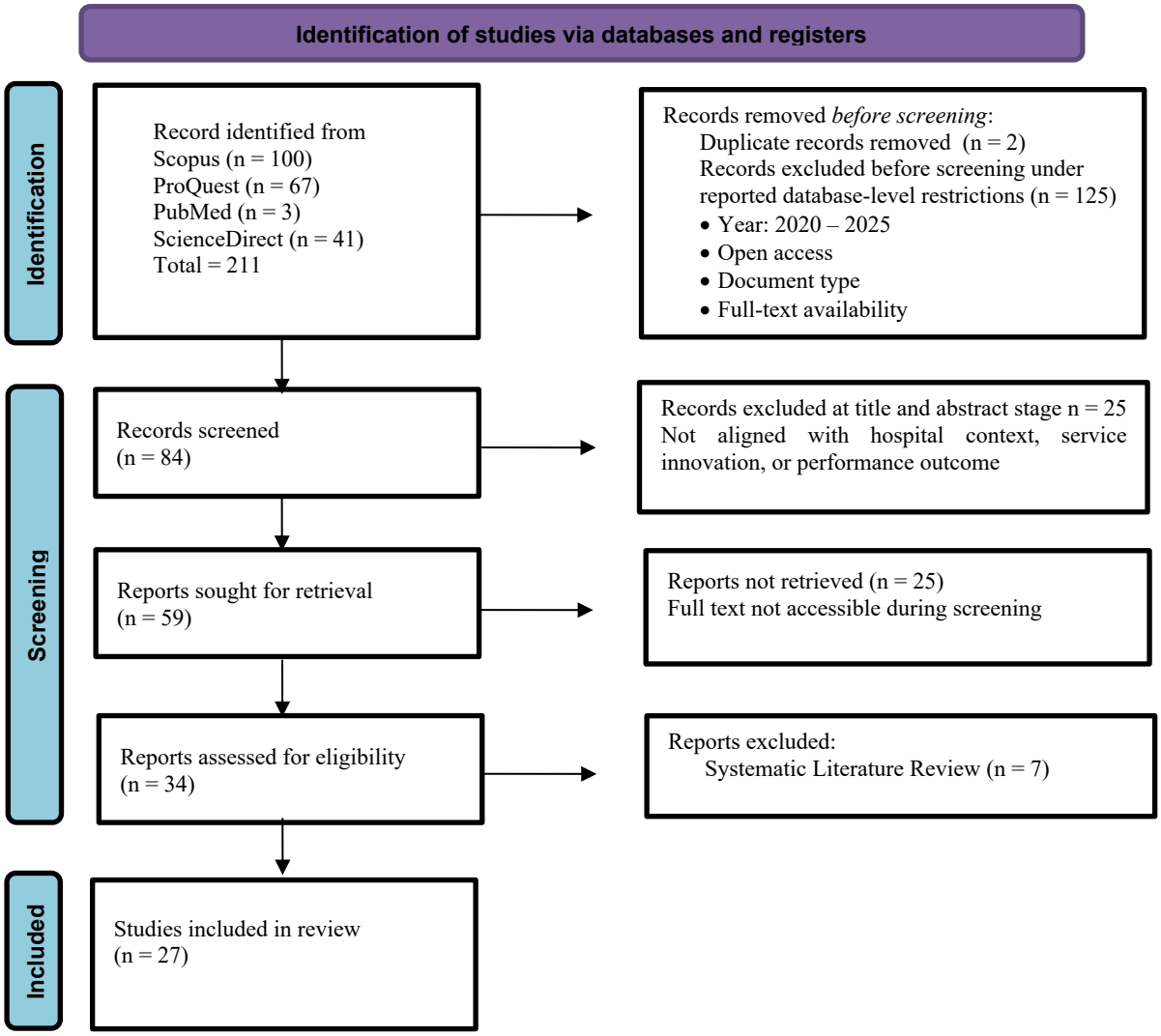


Figure 1. PRISMA 2020 flow diagram of study selection

Note. The study-selection counts are reproduced from the reported screening records. The 125 pre-screening exclusions were attributed to database-level restrictions concerning publication year, access status, document type, and full-text availability. Separate exclusion counts for these restrictions and documentation of whether they were applied automatically or manually were unavailable. Therefore, the screening sequence can be reconstructed numerically, but the individual pre-screening decisions cannot be independently verified.

Of the 211 records, 2 duplicates and 125 records described in the source as database-filter exclusions were removed before title and abstract screening. These filters concerned publication year, access status, document type, and full-text availability; the supplied records do not distinguish the individual exclusion counts or establish whether each exclusion was automated or manually applied. These pre-screening restrictions are distinct from substantive study eligibility criteria. The remaining 84 records were screened, of which 25 were excluded, leaving 59 reports sought for retrieval. Of these, 25 could not be retrieved, and 34 were assessed for eligibility. Seven systematic reviews were excluded, leaving 27 studies for inclusion. Alternative retrieval attempts were not documented; therefore, author contact, repository searches, or interlibrary loan requests cannot be claimed. Two reviewers reportedly conducted independent screening and reached full consensus. However, stage-specific decision counts, pre-consensus agreement statistics, and a decision matrix were unavailable. Accordingly, the previously reported $\kappa = 1.00$ is withdrawn rather than presented as a reproducible interrater reliability estimate.

Methodological adequacy was assessed using the Mixed Methods Appraisal Tool (MMAT; (Hong et al., 2018), as reported in the original review documentation. The available summary classified 19 studies as having good methodological adequacy and 8 as having moderate methodological adequacy. These categories are retained exclusively as author-reported descriptive judgments and should not be interpreted as validated MMAT summary scores. Because study-level criterion assessments and supporting appraisal records were unavailable, the individual classifications could not be independently verified. Consequently, methodological adequacy was not used to calculate quantitative evidence weights, rank the five pathways, or establish comparative confidence in particular intervention–outcome relationships.

A standardized matrix captured the author/year, context, method, innovation type, mechanism, outcome, evidence role (core hospital, healthcare-related, or cross-sector mechanism evidence), and methodological adequacy judgment. A narrative-thematic synthesis, rather than a meta-analysis, was employed because of the heterogeneity of the study designs. The synthesis proceeded by distinguishing evidence roles, identifying mechanisms inductively, and grouping the findings into five value pathways, each linked to a relevant theoretical lens.

Trustworthiness was supported by the reported dual-reviewer screening, a prespecified but unregistered protocol, and cross-checking of data extraction and methodological appraisal (Beuving & Vries, 2025; Lincoln & Guba, 1985). Explicit coding of context and evidence roles supports the assessment of transferability. However, the unavailability of the decision matrix, dated protocol, and item-level appraisal records limits the independent assessment of dependability and confirmability.

RESULTS AND DISCUSSION

The search identified 211 records across four databases. After deduplication and eligibility filtering, 84 records were screened at the title and abstract stages, 59 reports were sought for retrieval, 34 full-text reports were assessed for eligibility, and 27 empirical studies were included in the final synthesis. These comprised hospital-specific studies, healthcare service studies, and a smaller set of cross-sector studies retained to support mechanism development.

The included studies span diverse geographical and organizational contexts. Quantitative surveys and structural equation modeling (SEM) constitute the predominant methodological approaches, complemented by a smaller number of qualitative and mixed-methods investigations. This methodological profile supports the identification of reported relationships among constructs and proposed organizational mechanisms. However, the predominance of cross-sectional and nonexperimental designs limits the ability to establish causal relationships or determine the temporal sequence between service innovation and hospital performance outcomes.

The source reports that 19 studies demonstrated good methodological adequacy and 8 demonstrated moderate methodological adequacy, with none classified as having low methodological adequacy (Table 1). These narrative classifications cannot be independently verified without item-level Mixed Methods Appraisal Tool (MMAT) records. The predominance of cross-sectional designs further supports an association-based interpretation rather than causal conclusions.

Table 1
Evidence profile and adequacy of included studies

Evidence role	n	Dominant methodology	Adequacy judgement	Representative studies
Core hospital evidence	13	Quantitative surveys/SEM; qualitative and mixed methods	Subgroup appraisal counts not verifiable	Akinwale & AboAlsamh (2023); Alolayyan et al. (2020); Dąbrowski et al. (2025); Huynh (2025); He (2022)

Evidence role	n	Dominant methodology	Adequacy judgement	Representative studies
Healthcare-related evidence	6	Quantitative, qualitative and mixed methods	Subgroup appraisal counts not verifiable	Chaudhuri et al. (2023); Fahmi et al. (2020); Leedham-Green et al. (2021); Yeboah & Amponsah (2025)
Cross-sector mechanism evidence	8	Quantitative surveys/SEM	Subgroup appraisal counts not verifiable	Elizabeth, Prabowo, Bandur, et al. (2025a; 2025b); Harif et al. (2022); Pusparani et al. (2023); Zada et al. (2025)
Total	27		19 good, 8 moderate	

The reported evidence base comprised 13 core hospital studies, 6 healthcare-related studies, and 8 cross-sector studies retained for mechanism interpretation. These evidence-role categories were used to distinguish directly applicable hospital findings from broader contextual and theoretical evidence. However, the complete study-level inventory underlying this classification and the corresponding item-level methodological appraisal records were unavailable for independent verification. Therefore, the subgroup totals are retained as reported descriptive information, and no study-level distribution or comparative assessment of evidence strength is reconstructed. This limitation restricts the auditability of study inclusion, evidence-role assignment, and methodological adequacy across the 27-study synthesis.

CIMO-Based Thematic Synthesis

The synthesis indicates that service innovation functions as an orchestrating capability rather than a simple intervention. Across hospital contexts, it manifests through technology-enabled innovation, quality improvement, service program innovativeness, 3D printing, open innovation, patient-oriented innovation, platform-based collaboration, and innovative staff behavior. These forms of innovation are associated with performance outcomes through mechanisms including health information quality, service redesign, coordination, market orientation, co-creation, interorganizational trust, leadership, learning, absorptive capacity, and competitiveness.

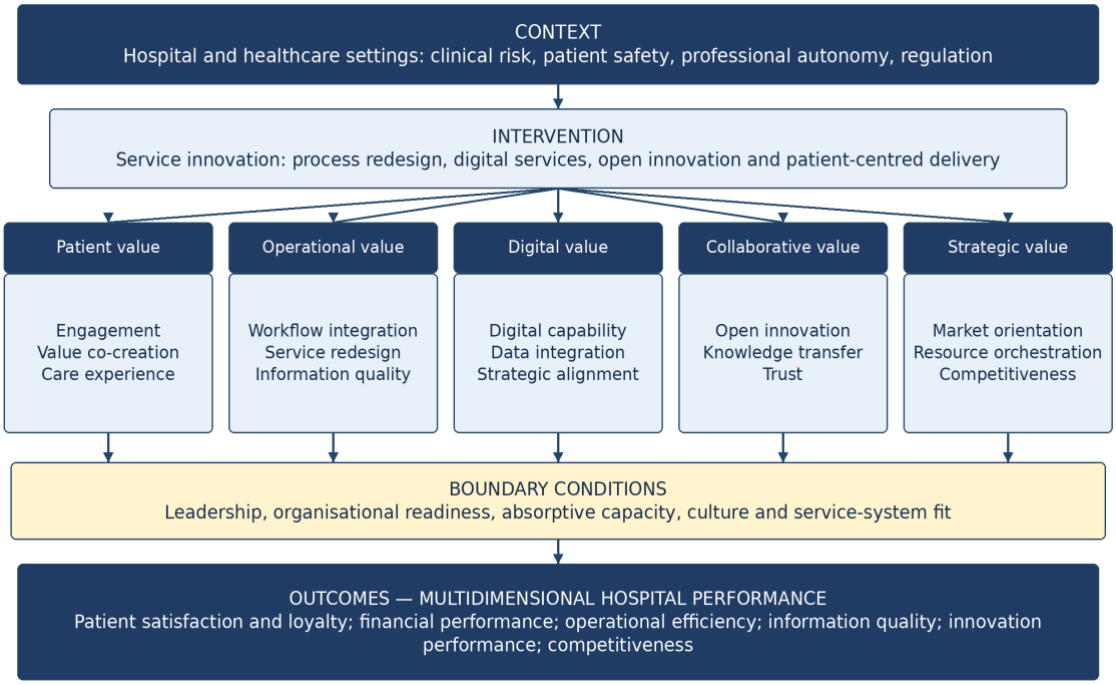


Figure 2. Conceptual model linking service innovation to multidimensional hospital performance through five CIMO-based value pathways

Figure 2 presents the proposed CIMO-based framework linking service innovation to multidimensional hospital performance. The framework organizes the reviewed evidence into five interrelated thematic pathways: patient-value, operational-value, digital-value, collaborative-value, and strategic-value. The patient-value pathway captures reported associations involving patient satisfaction, loyalty, experience, and patient-centered value (Fahmi et al., 2020; Hügle & Grek, 2023; Yeboah & Amponsah, 2025). The operational-value pathway concerns service redesign, workflow integration, information quality, coordination, and efficiency (Alolayyan et al., 2020; Arboleda & Diaz, 2025; Leedham-Green et al., 2021). The digital-value pathway highlights the proposed importance of organizational routines, information quality, digital capabilities, and strategic alignment in translating technology-enabled service innovation into performance-related outcomes (Akinwale & AboAlsamh, 2023; Alolayyan et al., 2020; Hügle & Grek, 2023). The collaborative-value pathway addresses open innovation, co-creation, knowledge transfer, and interorganizational trust (Chaudhuri et al., 2023) He et al., 2022; (Huynh, 2025). The strategic-value pathway focuses on reported relationships involving service innovativeness, competitiveness, financial performance, and strategic alignment (Dąbrowski et al., 2025; Yuliaty et al., 2025). These pathways are analytically distinguishable but potentially overlapping. They represent an interpretive synthesis of reported findings and theoretically proposed mechanisms rather than evidence that each mechanism has been causally established.

Table 2
CIMO synthesis of service innovation and hospital performance pathways

Pathway	Context	Intervention	Mechanism	Outcome
Patient value	Hospitals facing patient satisfaction/experience pressures	Patient-centred innovation; service redesign; digital patient-facing services	Value creation, engagement, access, care experience	Satisfaction, loyalty, empowerment, perceived value Representative evidence: (Yeboah & Amponsah (2025).
Operational value	Hospitals under efficiency/coordination pressure	Process redesign; continuous quality improvement; technology-enabled coordination	Workflow integration, information quality, staff readiness	Operational efficiency, patient flow, service reliability Representative evidence: Alolayyan et al. (2020).
Digital-value	Hospitals undergoing digital transformation	Health information technology, EMR, telemedicine, analytics	Information quality, digital capability, strategic alignment, data governance	Healthcare/hospital performance, digital readiness, sustainability Representative evidence: Hügle & Grek (2023).
Collaborative value	Hospitals engaging external technology/industry/platform actors	Open innovation, 3D printing services, university-hospital-industry collaboration	Co-creation, absorptive capacity, trust, knowledge transfer	Service innovativeness, innovation and platform performance Representative evidence: Chaudhuri et al. (2023).
Strategic value	Hospitals competing for patients,	Service programme innovativeness; market-	Novelty, differentiation, strategic fit, competitiveness	Financial and organisational performance, competitive advantage

Pathway	Context	Intervention	Mechanism	Outcome
	resources, reputation	oriented innovation		Representative evidence: Dąbrowski et al. (2025).

Each pathway is anchored in a distinct but complementary theoretical lens, extending the CIMO framework beyond descriptive synthesis toward a mechanism-oriented explanation (Table 3). Specifically, the patient-value pathway is grounded in Service-Dominant Logic, in which value is co-created through patient-clinician-system interactions (Fahmi et al., 2020; Vargo & Lusch, 2004; Yeboah & Amponsah, 2025). The operational-value pathway draws on the Donabedian Structure-Process-Outcome Framework, in which innovation may link structural resources with differences in processes and outcomes (Alolayyan et al., 2020; Arboleda & Diaz, 2025) ; Donabedian, 1988). The digital-value pathway is grounded in Sociotechnical Systems Theory and Dynamic Capabilities Theory, which suggest that digital tools become performance-relevant only when aligned with people, routines, and adaptive capabilities (Bostrom & Heinen, 1977; Hügle & Grek, 2023; Teece, 2007). This interpretation is consistent with bibliometric mapping that identifies digital technologies and human resource development as dominant, interconnected themes in hospital performance research (Eni et al., 2026). The collaborative-value pathway draws on Open Innovation Theory and Service-Dominant Logic, whereby knowledge inflows and multi-actor co-creation may be associated with innovativeness when supported by governance, trust, and absorptive capacity (Chaudhuri et al., 2023; Chesbrough, 2003; Vargo & Lusch, 2004). Finally, the strategic-value pathway is grounded in Dynamic Capabilities Theory and the Resource-Based View, whereby hospitals sense, seize, and reconfigure valuable, rare, and difficult-to-imitate resources to achieve competitive advantage (Barney, 1991; Dąbrowski et al., 2025; Teece, 2007).

Table 3
Theoretical grounding of the five service innovation–hospital performance pathways

Pathway	Main theoretical lens	Theoretical logic	Mechanisms explained	Performance outcomes explained
Patient-value	Service-Dominant Logic	Value co-created through patient-clinician-system interaction	Engagement, value-in-use, patient-centred design	Satisfaction, loyalty, empowerment, experience
Operational-value	Donabedian S-P-O Framework	Innovation transforms structures and processes into outcomes	Process redesign, workflow integration, quality improvement	Efficiency, patient flow, service quality, coordination
Digital-value	Sociotechnical Systems Theory; Dynamic Capabilities Theory	Value created when technology, people, and routines are aligned	Information quality, digital capability, strategic alignment	Digital readiness, healthcare performance, sustainability
Collaborative-value	Open Innovation Theory; Service-Dominant Logic	Innovation emerges through knowledge inflows and multi-actor co-creation	Co-creation, absorptive capacity, trust, knowledge transfer	Innovativeness, innovation and platform performance
Strategic-value	Dynamic Capabilities	Hospitals sense, seize, and	Market orientation,	Financial and organisational

Pathway	Main theoretical lens	Theoretical logic	Mechanisms explained	Performance outcomes explained
	Theory; Resource-Based View	reconfigure valuable resources	competitiveness, resource orchestration	performance, competitive advantage

Discussion

Hospital-specific studies report associations between service innovation and patient satisfaction and loyalty, financial performance, technology-enabled performance, innovation performance, and competitiveness, although these relationships are not uniform (Alolayyan et al., 2020; Dąbrowski et al., 2025; Fahmi et al., 2020; Yuliaty et al., 2025). These studies represent examples of directly relevant hospital evidence rather than a ranking based on quality, effect magnitude, or study frequency. Patient-value findings should be interpreted alongside service quality, engagement, and implementation readiness (Leedham-Green et al., 2021; Yeboah & Amponsah, 2025).

Several implications follow. First, hospital performance is multidimensional. In addition to financial performance, it encompasses operational efficiency, clinical quality, patient value, knowledge management, staff innovation, competitiveness, and digital transformation (Alolayyan et al., 2020; Hügle & Grek, 2023; Moreno-Domínguez et al., 2024). Therefore, evaluation should avoid single-metric approaches in favor of balanced measures spanning patient, process, digital, collaborative, and strategic outcomes (Arboleda & Diaz, 2025; Dąbrowski et al., 2025; Yuliaty et al., 2025). Second, digital transformation enables but does not guarantee innovation value. The digital-value pathway indicates that technology is associated with performance only when accompanied by information quality, workflow integration, and embedded organizational routines (Akinwale & AboAlsamh, 2023; Alolayyan et al., 2020; Hügle & Grek, 2023; Mollah et al., 2024; Moreno-Domínguez et al., 2024). Third, collaboration and knowledge integration matter. Service innovation increasingly depends on co-creation among hospitals, clinicians, patients, and industry and technology partners (Chaudhuri et al., 2023; He et al., 2022; Huynh, 2025), while value capture requires governance, absorptive capacity, and trust (Khan et al., 2022; Krychowski & Tézenas du Montcel, 2025). Accordingly, innovation should be governed as an ecosystem capability rather than as an isolated project. Fourth, the internal organizational context is a critical boundary condition. Leadership, culture, intrapreneurship, psychological capital, and organizational learning shape whether ideas translate into sustained performance improvements (Glover et al., 2020; Slåtten et al., 2020; Zhang et al., 2024), with transformational leadership and adhocracy-oriented cultures appearing particularly conducive to innovation (Moreno-Domínguez et al., 2024; Raoush, 2023). Fifth, evidence transferability is bounded. Cross-sector studies from hospitality, tourism, small and medium-sized enterprises (SMEs), banking, and universities provide useful evidence regarding potential mechanisms but cannot substitute for hospital-performance evidence, given hospitals' distinctive regulatory intensity, clinical accountability, and safety risks (Harif et al., 2022; Ibrahim et al., 2022; Pusparani et al., 2023; Wang et al., 2024). Therefore, core performance claims remain grounded in hospital and healthcare evidence (Alolayyan et al., 2020; Dąbrowski et al., 2025; Yeboah & Amponsah, 2025).

Theoretical Contributions

The theoretical contribution lies in distinguishing five proposed mechanisms while linking each to context, intervention, and outcome within the CIMO framework (Table 3). This approach makes it possible to distinguish a digital intervention from the information-quality mechanism through which it may be associated with performance, as well as to distinguish patient-value outcomes from strategic outcomes. Separating hospital evidence from cross-sector analogies also establishes clearer boundaries for transferability. The framework therefore provides an organizing explanation and a set of testable propositions rather than proof of novelty or validation of causal mechanisms.

The synthesis integrates several complementary theoretical perspectives to interpret the proposed relationships between service innovation and hospital performance. Dynamic Capabilities Theory provides a basis for understanding how hospitals may sense changing service

needs, seize innovation opportunities, and reconfigure clinical, technological, and organizational resources (Chaudhuri et al., 2023; Dąbrowski et al., 2025; Teece, 2007). The Resource-Based View suggests that performance-related differences may depend on how hospitals combine clinical expertise, digital infrastructure, leadership, and collaborative resources rather than on resource possession alone (Alolayyan et al., 2020; Barney, 1991; Moreno-Domínguez et al., 2024). Service-Dominant Logic helps explain the patient-value and collaborative-value pathways by conceptualizing patients, clinicians, managers, and external partners as participants in service value co-creation (Fahmi et al., 2020; Vargo & Lusch, 2004; Yeboah & Amponsah, 2025). The Donabedian Structure-Process-Outcome Framework provides an interpretive connection between organizational conditions, service delivery processes, and performance outcomes (Alolayyan et al., 2020; Arboleda & Diaz, 2025; Donabedian, 1988). Open Innovation Theory and Sociotechnical Systems Theory further illuminate the potential importance of external knowledge integration and alignment among technologies, people, organizational routines, and governance (Bostrom & Heinen, 1977; Chesbrough, 2003; Hügle & Grek, 2023). Taken together, these perspectives provide theoretical grounding for the five CIMO pathways, although their proposed mechanisms require direct empirical testing before causal explanations can be established.

Practical and Policy Implications

For hospital managers, service innovation should be governed as a multipathway performance capability. Innovation portfolios should combine patient-centered redesign, operational improvement, digital enablement, collaborative innovation, and strategic differentiation, with each component linked to measurable indicators such as patient satisfaction and experience, patient flow, information quality, clinical quality, staff innovation, competitiveness, and financial sustainability. For policymakers and regulators, the findings highlight the importance of enabling digital and collaborative infrastructure, interoperability, data governance, information security, innovation financing, technology evaluation, and cross-sector collaboration. Such measures would allow regulation to move beyond compliance toward supporting innovation governance and evidence-based scaling.

Contradictions and Evidence Boundaries

Reported associations between service innovation and hospital performance vary across organizational contexts, innovation types, and performance measures. Patient-value relationships appear sensitive to service quality, patient engagement, and implementation readiness, whereas digital-value relationships are interpreted in relation to information quality, workflow integration, and managerial alignment (Alolayyan et al., 2020; Leedham-Green et al., 2021; Yeboah & Amponsah, 2025). Related evidence from Indonesia's medical tourism sector illustrates this complexity. Ediansyah et al. (2023) reported a positive but statistically nonsignificant direct relationship between digital transformation and hospital performance, alongside significant relationships involving networking capability and resource integration. This study provides a relevant illustration of context-dependent associations; however, its precise position within the reported 27-study evidence inventory cannot be independently established from the available documentation. Therefore, the finding is used here to contextualize the discussion rather than to support an additional claim about the composition of the included evidence base. Given the predominance of cross-sectional and nonexperimental designs, the five CIMO pathways should be understood as proposed explanatory configurations requiring longitudinal, comparative, and mixed-methods examination.

Limitations and Future Research

Several limitations qualify the findings of this qualitative review. The evidence base is dominated by cross-sectional, nonexperimental studies, limiting causal inference and the ability to capture temporal sequencing and implementation dynamics. Therefore, the findings should be interpreted as mechanism-oriented and association-based. The review may also be affected by publication bias, as studies reporting significant or positive relationships may be overrepresented relative to those reporting null or mixed findings, although contradictory findings were considered where available. Open-access retrieval bias and database coverage bias are also

relevant. Eligibility was limited to accessible full texts retrieved through Scopus, ProQuest, ScienceDirect, and PubMed. Consequently, relevant studies indexed in other databases (e.g., Web of Science, EBSCOhost, CINAHL, and IEEE Xplore) may not have been captured. Future reviews should address this limitation through broader, database-specific search strategies. The protocol was not registered, and its original dated version is unavailable. In addition, 25 of the 59 reports sought for retrieval were inaccessible (42.4%), and access restrictions also applied before screening. These exclusions may have altered the balance of positive, null, or context-specific findings; however, their direction and magnitude cannot be determined. Non-equivalent database queries and missing search dates further limit reproducibility. The reported total of 27 studies and the overall appraisal distribution are retained as source-reported values, but the absence of a complete study inventory and item-level appraisal records limits auditability.

An additional limitation is that the reviewed evidence does not directly establish how organizational innovation ambitions interact with frontline workforce capacity during implementation. Related research on Indonesia's specialist medical education system has discussed tensions between institutional aspirations and workforce-related pressures through a paradox-theory perspective (Binsar & Hamsal, 2026). Although this evidence concerns a related but distinct institutional setting, it suggests a potentially relevant direction for future hospital research. Subsequent studies could examine whether tensions between innovation objectives, workforce readiness, and organizational support condition the relationship between service innovation and hospital performance. Such propositions should be empirically tested in hospital settings rather than inferred directly from evidence originating in medical education.

Future research should prioritize longitudinal, quasi-experimental, and mixed-methods designs to test causal sequencing among service innovation, underlying mechanisms, and performance. It should also develop multidimensional sustainable performance measures integrating financial, operational, clinical, patient, staff, and digital indicators; test moderators such as hospital ownership, digital maturity, organizational culture, and regulatory pressure; and distinguish among service innovation types (digital, process, patient-experience, collaborative, and green innovation), as each may operate through different mechanisms (Table 4).

Table 4
Future research agenda

Research priority	Observed limitation	Recommended agenda
Causal evidence	Cross-sectional studies dominate the evidence base	Longitudinal, quasi-experimental, pre-post implementation designs
Mechanism testing	Mechanisms often implied rather than directly tested	Model mediation via SEM, multilevel, or realist/mixed-method designs
Performance measurement	Performance indicators are heterogeneous and often perceptual	Multidimensional sustainable performance measures (objective + perceptual)
Boundary conditions	Hospital type, digital maturity, culture, ownership under-specified	Test moderators; multi-group analysis across hospital settings
Innovation typology	Different innovation forms often treated as equivalent	Differentiate digital, process, patient-experience, collaborative, green innovation

CONCLUSION

This CIMO-guided review synthesized reported associations between service innovation and hospital performance across 27 included studies. Service innovation is interpreted as a potential strategic capability whose relationship with multidimensional performance may operate through information quality, leadership, organizational readiness, market orientation, co-creation, absorptive capacity, competitiveness, and service-system fit. The predominantly cross-sectional evidence does not establish causal sequencing or guarantee performance gains.

The review identifies five pathways through which service innovation is associated with hospital performance: patient-value (satisfaction, loyalty, experience, and empowerment),

operational-value (workflow, quality improvement, coordination, and efficiency), digital-value (health information technology, digital transformation, and data-enabled service delivery), collaborative-value (open innovation, co-creation, trust, and cross-actor knowledge integration), and strategic-value (competitiveness, financial performance, differentiation, and sustainability).

The framework links hospital context, innovation interventions, proposed organizational mechanisms, and multidimensional performance outcomes. RQ1 is addressed through the identification of five proposed mechanism pathways; RQ2 through the identification of hospital-specific boundary conditions and the distinction between hospital and cross-sector evidence; and RQ3 through the synthesis of reported patient, operational, digital, collaborative, and strategic outcomes. These outcomes are not ranked by consistency or effect strength because a study-level comparative assessment is unavailable. The framework offers propositions for longitudinal and comparative testing, subject to the search, retrieval, and appraisal limitations described above.

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AUTHOR CONTRIBUTIONS

All authors contributed to the development of this research. Lisbeth Mariane Siahaan, as the first author, initiated the research concept, developed the research framework, collected and analysed the data, interpreted the results, and prepared the initial manuscript draft. Hendy Tannady, Mohammad Hamsal, and Tantri Yanuar Rahmat Syah contributed to the development of the research ideas, academic supervision, methodological refinement, critical review of the manuscript's content, validation of the findings, and final revision of the manuscript. All authors have read and approved the final version of the manuscript and take responsibility for the integrity, accuracy, and transparency of all aspects of the research.

REFERENCES

Ahmed, S. K., Mohammed, R. A., Nashwan, A. J., Ibrahim, R. H., Abdalla, A. Q., Ameen, B. M. M., & Khdhir, R. M. (2025). Using thematic analysis in qualitative research. *Journal of Medicine, Surgery, and Public Health*, *6*, 100198.

Akinwale, Y. O., & AboAlsamh, H. M. (2023). Technology innovation and healthcare performance among healthcare organisations in Saudi Arabia: A structural equation model analysis. *Sustainability*, *15*(5), 3962. https://doi.org/10.3390/su15053962

Alolayyan, M. N., Alyahya, M. S., Alalawin, A. H., Shoukat, A., & Nusairat, F. T. (2020). Health information technology and hospital performance: The role of health information quality in teaching hospitals. *Heliyon*, *6*(10), e05040. https://doi.org/10.1016/j.heliyon.2020.e05040

Arboleda, R. P., & Diaz, M. N. R. (2025). Quality improvement strategies of secondary hospitals in the Philippines: A basis for hospital CQI model. *Journal of Business and Management Studies*, *7*(3), 158–290. https://doi.org/10.32996/jbms.2025.7.3.14

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Beuving, J., & Vries, G. (2025). *Doing qualitative research: The craft of naturalistic inquiry*. Routledge.

Binsar, F., & Hamsal, M. (2026). Exploring the Icarus Paradox in Indonesia's specialist medical education system using the public perspective from online media: Convergent mixed methods study. *JMIR Medical Education*, *12*, e60452. https://doi.org/10.2196/60452

Bostrom, R. P., & Heinen, J. S. (1977). MIS problems and failures: A socio-technical perspective. Part I: The causes. *MIS Quarterly*, *1*(3), 17–32. https://doi.org/10.2307/248710

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Chaudhuri, A., Naseraldin, H., & Narayanamurthy, G. (2023). Healthcare 3D printing service innovation: Resources and capabilities for value co-creation. *Technovation*, *121*, 102596. https://doi.org/10.1016/j.technovation.2022.102596

Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business School Press.

Dąbrowski, D., Kukier, W., & Tybińkowska, A. (2025). Responsive and proactive market orientation and hospital financial performance: The mediating effect of service programme innovativeness. *Journal of Entrepreneurship, Management and Innovation*, *21*(1), 5–23. https://doi.org/10.7341/20252111

Donabedian, A. (1988). The quality of care: How can it be assessed? *JAMA*, *260*(12), 1743–1748. https://doi.org/10.1001/jama.1988.03410120089033

Ediansyah, Arief, M., Hamsal, M., & Abdinagoro, S. B. (2023). Interplay between networking capability and hospital performance in Indonesia's medical tourism sector. *International Journal of Environmental Research and Public Health*, *20*(1), 374. https://doi.org/10.3390/ijerph20010374

Elizabeth, E., Prabowo, H., Bandur, A., & Setiowati, R. (2025). Harnessing green dynamic capabilities for sustainable tourism performance: The mediating role of green service innovation in Bali's tour and travel SMEs. *Tourism and Hospitality*, *6*(3), 156. https://doi.org/10.3390/tourhosp6030156

Elizabeth, E., Prabowo, H., Setiowati, R., & Bandur, A. (2025). Sustainable tourism strategies: Examining green service innovation as a mediator between the marketing mix and business performance in Bali's tour and travel SMEs. *Tourism and Hospitality*, *6*(3), 129. https://doi.org/10.3390/tourhosp6030129

Eni, Y., Hamsal, M., Ichsan, M., & Binsar, F. (2026). Management hospital performance: A systematic literature review from 2020-2025 and future research directions. *Global Business & Finance Review*, *31*(5), 151–166. https://doi.org/10.17549/gbfr.2026.31.5.151

Fahmi, A., Qomariah, N., & Cahyono, D. (2020). Effect of service quality and service innovation of patient satisfaction and loyalty. *International Journal of Engineering Research & Technology*, *9*(6), 1085–1090.

Glover, W. J., Nissinboim, N., & Naveh, E. (2020). Examining innovation in hospital units: A complex adaptive systems approach. *BMC Health Services Research*, *20*, 554. https://doi.org/10.1186/s12913-020-05403-2

Harif, M. A. A. M., Nawaz, M., & Hameed, W. U. (2022). The role of open innovation, hotel service quality and marketing strategy in hotel business performance. *Heliyon*, *8*, e10441. https://doi.org/10.1016/j.heliyon.2022.e10441

He, J., Hu, C., & Lin, C.-C. (2022). Service innovation, inter-organisational trust, and performance in hospital platforms: Social network and agency perspectives. *Frontiers in Public Health*, *10*, 819371. https://doi.org/10.3389/fpubh.2022.819371

Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., Rousseau, M.-C., & Vedel, I. (2018). *Mixed Methods Appraisal Tool (MMAT), version 2018*. http://mixedmethodsappraisaltoolpublic.pbworks.com/

Hügle, T., & Grek, V. (2023). Digital transformation of an academic hospital department: A case study on strategic planning using the balanced scorecard. *PLOS Digital Health*, *2*(11), e0000385. https://doi.org/10.1371/journal.pdig.0000385

Huynh, T. (2025). Collaborative research in healthcare: Uncovering the impact of industry collaboration on the service innovativeness of university hospitals. *Journal of Technology Transfer*, *50*, 1–28. https://doi.org/10.1007/s10961-024-10083-9

Ibrahim, M., Yusheng, K., & Adam, D. R. (2022). Linking service innovation to organisational performance: Mediating role of employee productivity and job satisfaction. *International Journal of Service Science, Management, Engineering, and Technology*, *13*(1). https://doi.org/10.4018/IJSSMET.295558

Khan, M. J., Ahmad, S., Halim, H. A., & Ahmad, N. H. (2022). The effect of service innovation orientation and open innovation on innovation performance of medium and small private hospitals in India. *SAGE Open*, *12*(3). https://doi.org/10.1177/21582440221116110

Krychowski, C., & Tézenas du Montcel, B. (2025). Open innovation within the hospital: Lessons from an additive manufacturing initiative. *Journal of Innovation Economics & Management*, *47*, 145–173. https://doi.org/10.3917/jie.047.0145

Leedham-Green, K., Knight, A., & Reedy, G. B. (2021). Success and limiting factors in health service

innovation: A theory-generating mixed methods evaluation of UK projects. *BMJ Open*, *11*, e047943. https://doi.org/10.1136/bmjopen-2020-047943

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications. https://scholar.google.com/scholar?q=Naturalistic+inquiry

Mollah, M. A., Amin, M. B., Debnath, G. C., Hosain, M. S., Rahaman, M. A., & Abdullah, M. (2024). Nexus among digital leadership, digital transformation, and digital innovation for sustainable financial performance: Revealing the influence of environmental dynamism. *Sustainability*, *16*(18), 8023. https://doi.org/10.3390/su16188023

Moreno-Domínguez, M.-J., Escobar-Rodríguez, T., Pelayo-Díaz, Y.-M., & Tovar-García, I. (2024). Organizational culture and leadership style in Spanish hospitals: Effects on knowledge management and efficiency. *Heliyon*, *10*, e39216. https://doi.org/10.1016/j.heliyon.2024.e39216

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., & Brennan, S. E. (2022). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Revista Panamericana de Salud Publica*, *46*, e112.

Pusparani, R., Moko, W., & Prabandari, S. P. (2023). The role of service innovation in mediating entrepreneurial orientation, organizational learning capability, and organizational performance relationship: A study on Directorate General of State Assets Management, Indonesia. *International Journal of Research in Business and Social Science*, *12*(7), 24–37. https://doi.org/10.20525/ijrbs.v12i7.2921

Raoush, A. (2023). Transformational leadership impact on innovative behaviour as perceived by healthcare workers in private hospitals in Jordan. *Cogent Business & Management*, *10*(3), 2265606. https://doi.org/10.1080/23311975.2023.2265606

Slåtten, T., Mutonyi, B. R., & Lien, G. (2020). The impact of individual creativity, psychological capital, and leadership autonomy support on hospital employees' innovative behaviour. *BMC Health Services Research*, *20*, 1096. https://doi.org/10.1186/s12913-020-05954-4

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319–1350. https://doi.org/10.1002/smj.640

van den Hoed, M. W., Backhaus, R., de Vries, E., Hamers, J. P. H., & Daniëls, R. (2022). Factors contributing to innovation readiness in health care organizations: a scoping review. *BMC Health Services Research*, *22*(1), 997.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, *68*(1), 1–17. https://doi.org/10.1509/jmkg.68.1.1.24036

Wang, J., Phawitpiriyakliti, C., Sangsrijan, J., & Terason, S. (2024). Elevating organizational performance of university through organizational learning, organizational agility, and service innovation. *Journal of Ecohumanism*, *3*(4), 1637–1654. https://doi.org/10.62754/joe.v3i4.3693

Yeboah, J. G., & Amponsah, K. T. (2025). The mediating role of service innovation in the relationship between customer orientation and patient satisfaction. *BMC Health Services Research*, *25*, 803. https://doi.org/10.1186/s12913-025-12794-7

Yuliaty, F., Kosasih, K., Rosady, F., Erlambang, R. Y., & Amin, H. (2025). The impact of service innovation, total quality management, and technology adoption on competitiveness and its effects on the performance of third-level military health center hospitals. *Indonesian Interdisciplinary Journal of Sharia Economics*, *8*(3), 15305–15326. https://doi.org/10.31538/iijse.v8i3.7099

Zada, M., Erkol Bayram, G., Contreras-Barraza, N., Kaptangil, K., & Aylan, S. (2025). Integrating social media-driven service innovation and sustainable leadership: Advancing sustainable practices in tourism and hospitality. *Sustainability*, *17*(2), 399. https://doi.org/10.3390/su17020399

Zhang, G., Lin, W., Song, G., Chen, J., Li, H., Sun, L., Cheng, B., & Zhang, X. (2024). The mediating role of psychological capital on the relationship between authentic leadership and innovative behaviour among Chinese nurses. *Nursing Open*, *11*(3), e2126.