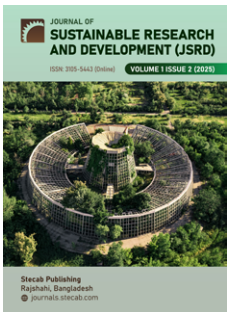

Journal of Sustainable Research and Development (JSRD)

ISSN: 3105-5443 (Online)

Volume 1 Issue 2, (2025)

https://doi.org/10.69739/jsrd.v1i2.1217

https://journals.stecab.com/jsrd

Published by
Stecab Publishing

Review Article

A Strategic Project Management Framework for Implementing Patient-Centered Digital Health Record Systems to Improve Chronic Disease Outcomes in the United States

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About Article

Article History

Submission: October 07, 2025
Acceptance : November 10, 2025
Publication : November 13, 2025

Keywords

Food Safety, Health Risk Assessment, Heavy Metals, Nigeria, Smoked Fish

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ABSTRACT

Chronic diseases remain among the most critical national health challenges in the United States, contributing substantially to morbidity, mortality, and healthcare costs. Digital health record systems including electronic health records, patient portals, and integrated care platforms are central to improving care coordination, patient engagement, and long-term disease management. However, many implementation efforts fail due to inadequate project management, limited stakeholder participation, and insufficient patient-centered design. This paper synthesizes existing research on project management and patient-centered digital health implementation to propose a Strategic Project-Management Framework for enhancing chronic disease outcomes. Drawing from peer-reviewed literature, policy documents, and healthcare IT reports across major databases (PubMed, Scopus, Web of Science, and Google Scholar), the review identifies critical success factors, barriers, and emerging trends shaping digital health system adoption. The analysis demonstrates that integrating structured project management methodologies with patient-centered principles is essential for creating usable, sustainable, and clinically effective digital health systems. We present a Strategic Project-Management Framework that integrates the core phases of initiation, planning, execution, monitoring, and closure with co-design, feedback, and participatory engagement mechanisms. This integration promotes stronger system adoption, improved care coordination, and better chronic disease outcomes. The framework establishes a replicable, adaptable model for healthcare organizations and provides a foundation for future empirical validation and policy development.

Citation Style:

Enabulele, A. B. O., Eleweke, C. C., Okechukwu, O., Akanbi, O. O., & Majesty, C. (2025). A Strategic Project Management Framework for Implementing Patient-Centered Digital Health Record Systems to Improve Chronic Disease Outcomes in the United States. *Journal of Sustainable Research and Development, 1*(2), 55-67. https://doi.org/10.69739/jsrd.v1i2.1217

1. INTRODUCTION

1.1. Background

The chronic diseases, such as those involving diabetes, cardiovascular diseases, chronic obstructive pulmonary disease (COPD) and hypertension are some of the most urgent public health challenges in the United States. These health conditions constitute most of the health care expenditure, disability and mortality causing people enormous burden in terms of individuals, families and health care system. Management of chronic diseases implies multidisciplinary, lifelong, and patient-centered care, which is facilitated by timely and correct exchange of information across various care environments (Hacker, 2024).

Electronic Health Records (EHR), patient portals, and integrated care platforms that are under the category of digital health record systems have become important mechanisms in enhancing the management of chronic diseases. Such systems will help healthcare providers to gather, store, and exchange patient information effectively to enhance evidence-based decision-making and enhance patient involvement by providing easy access to health information. In addition, digital health technologies can provide remote monitoring opportunity, data analytics, and population health management, which have the potential to optimize the quality and care outcomes of patients with chronic conditions (Alomar *et al.*, 2024; Lawal *et al.*, 2025). Nevertheless, the introduction of the digital health records systems and their further usage are still associated with serious problems. The issue of system integration, data interoperability, and adoption by the users is challenging in many healthcare organizations. Poor project management, stakeholder involvement, and lack of patient-focused design creates a tendency to face delays in implementation, cost increase, and underutilization of EHR systems. As a result, the potential of digital health to enhance the outcomes of long-term chronic diseases will not be met completely, which explains the importance of new and more tactical and comprehensive implementation strategies (Egwudo *et al.*, 2025).

1.2. Rationale for the Review

Although the implementation of digital health technologies has been growing faster in the last ten years, there is a significant proportion of usability of Electronic Health Records (EHR) initiatives that lose their purpose after implementation. A major cause of these failures is the non-response to the complexities of healthcare settings, through poor project management practices. Most of the projects tend to concentrate more on the technological implementation aspect and overlook such aspects of human factors like the needs of users, business culture, and the involvement of patients. Subsequently, systems can technically work but not comply with workflows and patient demands.

Moreover, the majority of currently available implementation frameworks focus on the administrative or technical aspects and pay little attention to the importance of patient-centered principles of care. An approach that is patient-focused means that it dictates usability, accessibility, and active involvement which makes sure that technology enhances, but does not obstruct clinical relationships and patient autonomy. This approach to project management needs to be incorporated in the practice so that system adoption and long-term health outcomes can be tremendously better.

Such a review is thus justified to examine how the combination of strategic project management and the use of patient-centered approaches to design could be useful in maximizing the utilization of digital health records systems to manage chronic diseases. It will bridge the theoretical divide between the implementation processes with technology and patient-centered health outcomes.

1.3. Aim and Objectives

1.3.1. Aim

To integrate the current research on project management and patient-centered implementation of digital health to create a conceptual framework that can be used to enhance the defeat of chronic diseases in the United States.

1.3.2. Objectives

i. To assess project management strategies that are used in the implementation of healthcare information technology (IT).

ii. To discuss the importance of patient-centered design as a way of enhancing the system usability, adoption and clinical outcomes.

iii. To determine the success factors and obstacles that affect the use of digital health record systems.

iv. To put forward a composite methodical project-management system that enables ideal, patient-focused digital health execution.

1.4. Scope of the Review

The scope of this narrative review mostly relates to the literature, case studies, and policy reports in United States where chronic diseases have been a major contributor of morbidity, and healthcare spending. The American healthcare environment offers an accessible view of the digital transformation and project management intersection as it is a complex system of diverse health systems, funding on technological use, and regulations. Although the major focus is on the American situation, the international experience is also taken into account to offer comparison and determine the global best practices. The review is very specific to digital-based health programs that deal with chronic disease management, including diabetes care programs, cardiac monitoring networks, and integrated care networks, in which patient engagement and coordinated data management are very important.

2. LITERATURE REVIEW

2.1. The Burden of Chronic Diseases in the U.S. Healthcare System

Chronic illnesses are the most common causes of mortality and morbidity in the United States and they consume almost 90 percent of the annual healthcare spending in the country. The Centers for Disease Control and Prevention (CDC) discuss that most adults over the age of 60 in the U.S. constitute about 6 out of ten, living with one chronic disease, which may include diabetes, high blood pressure, heart disease, or long-lasting lung disease and various respiratory diseases. The diseases in

question are the leading causes of low-quality of life, decreased productivity, and increasing medical expenses (Carney *et al.*, 2023).

One of the most significant obstacles to chronic care management is the lack of a unified structure in the delivery by various providers and institutions. There is a tendency of patients to be provided by multiple specialists and institutions that use non-interoperable information systems. The result of this fragmentation is duplication of tests, irregular treatment, medication errors and communication inefficiencies. Administering chronic diseases, therefore, requires a concise, information-driven strategy with integrated digital health structures that allow free flow of information and collaborative care design (Joo, 2023).

2.2. Evolution of Digital Health Record Systems

The history of digital health record systems development in the United States has been developing throughout the decades due to changes in technological progress and policy interventions. The initial attempts were done in the 1960s and 1970s with the need to digitalize administrative data as opposed to clinical information. The adoption of Electronic Health Records (EHRs) to enhance quality, safety, and efficiency in the healthcare delivery started to be actively promoted by the federal government only in the 2000s (Negro-Calduch *et al.*, 2021).

The Health Information Technology (HIT) for Economic and Clinical Health (HITECH) Act 2009 was a significant milestone that offered monetary incentives to healthcare organizations to implement and meaningfully utilize certified EHR technology. This initiative resulted in massive uptake of EHRs, which formed the basis of health information exchange at the national level. Then, the program of meaning use introduced the requirements to make sure that EHRs were effectively utilized to enhance clinical procedures and outcomes (Modi & Feldman, 2022).

The existing digital health systems do not just involve conventional EHRs but also Personal Health Records (PHRs) patient-controlled systems to monitor their health data and integrated care systems that integrate multiple providers through their networks. All of these tools contribute to the management of population health, remote monitoring, and patient engagement. Nevertheless, significant investments, even though, the success of implementation has a wide range both because of organizational, technical, and human considerations thus, highlighting the significance of planned management approaches to projects (Ahmed *et al.*, 2025).

2.3. Patient-Centered Care and Digital Health Design

The patient-centered care principle is based on a respect towards the personal patients preferences, needs, and values, with the assumption that they serve as the driving factor in all clinical decision-making. In the field of digital health, this idea is applied to create systems that are easy to use, accessible, and responsive to the actions and experiences of patients. A digital health record that is patient-centered enables people both to gain access to their medical data, interact with providers and to actively engage in the management of their conditions (Edgman-Levitan & Schoenbaum, 2021).

The fundamentals of successful adoption of a digital system are usability and accessibility. The interface design can be incorrect and may deter patients and clinicians; or it can possess complex functionality; or it may not be interoperable. On the other hand, ease of use models improve satisfaction, trust, and interaction with patients. Research has revealed that patients with high internet portals or mobile health apps usage translate to increased medication adherence, disease self-management, and improved clinical outcomes in, among others, diabetes and hypertension (Olakotan *et al.*, 2025).

Healthcare organizations should be able to align the digital health technologies with the real-life needs of users by incorporating the participation of patients and co-design principles in their system development. Therefore, patient-centered design does not only enhance the usability of the system but it also aids in behavioral and clinical change essential in handling chronic diseases (de la Torre *et al.*, 2025).

2.4. Project Management Frameworks in Healthcare IT Implementation

Project management will offer an organized procedure, equipment, and management required to influence intricate healthcare technology applications. The systematized concept of project initiation, planning, execution, monitoring, and closing is provided in the traditional framework i.e., the Project Management Body of Knowledge (PMBOK) and PRINCE2. These approaches put emphasis on documentation, risk management, stakeholder engagement, and quality control important factors in the management of large scale healthcare projects (Simonaitis *et al.*, 2023).

The process of healthcare is however very dynamic and therefore demands flexibility and adaptability. Accordingly, the agile project management practices, that place more emphasis on incremental development, collaboration with users, and change responsiveness have become predominant in digital health implementation. Mixed methods of agile and traditional models have been found to be effective in the process of balancing structure and the use of flexibility (Almalki, 2025; Enabulele *et al.*, 2025).

Some of the critical success factors that are observed in healthcare IT projects are early and constant stakeholder engagement, effective change management, effective communication, and extensive training. The presence of leadership dedication and concurrence between clinical and IT teams also plays the crucial role of sustaining the project momentum and ensuring that digital systems fulfill both technical and clinical goals (Sony *et al.*, 2023).

2.5. Challenges in Implementing Patient-Centered Digital Health Systems

Even with major advances, many obstacles that impede the successful introduction of patient-centered digital health systems exist.

Also, technical challenges such as interoperability between incompatible EHR systems, data security, and privacy issues, and poor IT infrastructure in smaller healthcare facilities are considered (Tsai *et al.*, 2020). Organizational issues include resistance to change, failure to align the design of technology and

clinical processes, and conflicting institutional interests. Human Inadequate digital literacy, lack of training, and workload of clinicians are among other factors that lead to the low adoption rates and dissatisfaction in users (Walker *et al.*, 2023).

Moreover, the complexity of healthcare regulation in the U.S., along with a range of different reimbursement models, tends to limit the efforts of innovation and data-sharing. It is on the basis of these multi-level challenges that project management strategies integrating risk assessment, stakeholder analysis and ongoing evaluation should be considered to predict possible hurdles and eliminate them.

2.6. Linking Project Management and Patient-Centered Outcomes

It is increasingly being acknowledged that successful project management is a direct cause of the success of any digital implementation of health and, consequently, patient outcomes. Project management in a structured way will facilitate delivery of initiatives within budget and also on time with well-defined performance benchmarks. More to the point, it enables alignment of the stakeholders, ongoing communication, and creative problem-solving that is critical towards patient-centered innovation (Cristina *et al.*, 2024).

Case studies have shown that a project where integrated management practices are applied has a greater rate of clinician and patient adoption, is more interoperable and has a greater rate of data accuracy. In addition, systematic reviews indicate that system design can be improved by involving patients and clinicians as active participants in the system design process using co-design or participatory methods that can make the system easier to use and more sustainable in the long term (Ștefan *et al.*, 2024).

In this way, the connection between project management processes and the principle of patient-centered care not only increases its system performance but also develops trust and engagement and, eventually, leads to the positive chronic disease outcomes.

2.7. Gaps in the Existing Literature

Even though there is a body of research on the implementation of EHR and project management in the healthcare sector, there is still a definite gap when it comes to the integration of both concepts and patient-centered design. Majority of the studies focus on project management as an administrative or operation process of an organization as opposed to a strategy of enhancing health outcomes. Equally, although frameworks of patient-centered care focus on engagement and usability, they seldom discuss project management frameworks required to meet the objectives in a systematic way.

This lack of connection shows the urgent necessity of developing a single strategic concept uniting the approaches to project management and the ideals of patient-centeredness. This kind of framework would enlighten the development, use, and assessment of the digital health records systems in order to make them technically sound as well as humane. The presence of this gap may be a key to a better and prolonged performance and viability of digital health efforts to improve the outcomes of chronic diseases in the United States.

3. METHODOLOGY

3.1. Review Design

This study adopted a narrative review design with a structured and integrative synthesis approach. The design was selected to enable critical interpretation and conceptual integration of literature from multiple disciplines project management, digital health informatics, and patient-centered care. Unlike systematic reviews that focus on quantitative aggregation, this narrative review aimed to identify patterns, relationships, and conceptual frameworks that inform the effective implementation of digital health record systems for chronic disease management in the United States.

3.2. Search Strategy

A comprehensive literature search was conducted across PubMed, Scopus, Web of Science, and Google Scholar databases for publications between January 2005 and March 2025. The date range reflects the rapid development of digital health systems and the introduction of key U.S. health information technology policies, such as the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009.

Searches combined the main concepts of digital health records, project management, patient-centered care, and chronic disease using Boolean operators. The representative search string applied in PubMed was:

("digital health record" OR "electronic health record" OR "personal health record" OR "integrated care system")
AND ("project management" OR "implementation framework" OR "agile" OR "PRINCE2" OR "PMBOK")
AND ("patient-centered care" OR "user-centered design" OR "co-design" OR "patient engagement")
AND ("chronic disease" OR "chronic illness" OR "long-term condition" OR "disease outcome")
AND (United States OR U.S. OR USA)

The initial search yielded 1,042 records. After removing duplicates (n = 214), 828 records were screened by title and abstract. 312 full-text articles were reviewed in detail, and 97 studies met the inclusion criteria for final synthesis. Reference lists of included studies were also manually checked for additional relevant sources.

3.3. Inclusion and Exclusion Criteria

The review applied clear inclusion and exclusion criteria to ensure relevance and quality.

Inclusion criteria:

- English-language publications from 2005 to 2025.
- Peer-reviewed journal articles, reviews, policy reports, and conceptual frameworks.
- Studies addressing digital health record systems (EHRs, PHRs, or integrated care platforms) used in chronic disease management.
- Research incorporating project management, implementation frameworks, or patient-centered design principles.
- Studies primarily based in the United States, with international examples included for comparative insight.

Exclusion criteria:

- Non-English publications.

• Clinical intervention studies unrelated to digital health systems or project management.
• Research focused solely on telemedicine, mobile health, or unrelated digital technologies.
• Commentaries or editorials lacking empirical or conceptual contribution.

3.4. Data Extraction and Synthesis

For each included study, data were systematically extracted on publication details, objectives, methods, key findings, and relevance to the review aims. Information was organized under four thematic domains:

1. Project management in healthcare IT implementation,
2. Patient-centered digital design and engagement,
3. Barriers and facilitators to system adoption, and
4. Relationships between implementation strategies and chronic disease outcomes.

A qualitative thematic synthesis was then conducted to identify recurring concepts, relationships, and gaps. Themes were refined iteratively to develop an integrated Strategic Project-Management Framework linking project management processes with patient-centered design principles.

3.5. Quality Assurance and Transparency

Although the review is narrative in nature, principles of systematic transparency were applied throughout. Search procedures, selection criteria, and synthesis steps were documented to enhance reproducibility.

4. RESULTS AND DISCUSSION

4.1. Thematic Synthesis

This area provides the key findings of the literature reviewed and represents them thematically to denote the crucial aspects that may affect the introduction of patient-centered digital health record systems to manage chronic diseases. The synthesis identified five overall themes, but effective project management practices, the role of patient engagement and co-design, barriers and facilitators to adoption, the connection between implementation processes and chronic disease outcomes, and emerging trends to shape the future of digital health systems.

4.2. Theme 1: Effective Project Management Practices in Digital Health Implementation

The commitment made through the literature is that the structural project management is the main factor in the success of the implementation of digital health systems. Research shows that use of identified frameworks like PMBOK, PRINCE2, and Agile frameworks contributes to scope clarification, minimization of risks, stakeholder engagement, and accountability in lifecycles of projects (Simonaitis *et al.*, 2023).

Such essential success factors are extensive planning, bringing in stakeholders in early phases and repetitive evaluation of milestones against the set benchmarks. It is also emphasized in studies that change management is vital, especially when it comes to medical practice environments that are marked by quite complicated workflows and cultural unwillingness to adopt innovations (Moghaddasi *et al.*, 2025).

Combination models: Hybrid models, which build predictability of traditional project management and flexibility of agile practice are also proven to be really useful. The models enable the project teams to be flexible to emerging clinical requirements and regulatory demands at the same time without a loosely structured governance. Besides, the involvement of leadership and the provision of effective communication channels between IT and clinical and administrative departments are recurrently stated to be critical in maintaining the project momentum and reaching long-lasting implementation (Enabulele *et al.*, 2025).

Health institutions which have adopted digital health have embraced different approaches to project management to increase coordination, accountability, and flexibility. Practical frameworks like PMBOK and PRINCE2 provide rather well-organized governance and documentation, but agile approaches lay stress on flexibility, cooperative work by the stakeholders, and progressive improvement. Recent studies propose that the hybrid model that integrates these methods particularly can be effective in multifaceted healthcare settings (Cristina *et al.*, 2024). Table 1 provides an overview of the key project management models applicable in healthcare IT implementation.

Table 1. Comparison of Project Management Frameworks in Healthcare IT Implementation

Framework	Key Features	Advantages in Healthcare Context	Limitations
PMBOK (Project Management Body of Knowledge)	Structured, phase-based methodology emphasizing scope, time, cost, and quality management.	Provides comprehensive documentation and accountability; suitable for large-scale, regulated healthcare projects.	May be rigid; limited adaptability to rapid change or iterative design (Moghaddasi *et al.*, 2025).
PRINCE2 (Projects in Controlled Environments)	Governance-oriented with defined stages, roles, and deliverables.	Ensures strong control and traceability across project phases.	Can be overly bureaucratic for smaller or cross-disciplinary projects (Simonaitis *et al.*, 2023).
Agile / Scrum	Iterative, incremental development emphasizing flexibility, collaboration, and user feedback.	Encourages continuous improvement and responsiveness to clinical workflow needs; enhances stakeholder participation.	Requires cultural and organizational readiness; less emphasis on formal documentation (Enabulele *et al.*, 2025).

Lean / Six Sigma	Focuses on efficiency, waste reduction, and process improvement.	Promotes workflow optimization and cost reduction; useful for health process redesign.	Limited guidance on complex, multi-stakeholder IT projects (McDermott *et al.*, 2022).
Hybrid (Proposed Approach)	Combines structured planning from PMBOK/PRINCE2 with agile flexibility and patient co-design principles.	Balances control with adaptability; fosters patient-centered innovation and continuous feedback.	Requires skilled project teams and supportive leadership culture (Eddoug *et al.*, 2025).

Note. Adapted from existing literature on project management in healthcare IT; hybrid models are increasingly recognized as optimal for digital health system implementation.

4.3. Theme 2: The Role of Patient Engagement and Co-Design

The main topic that appears in the literature is the transformational nature of patient engagement with improving usability and effectiveness of digital health record systems. Operationalized as co-design and participatory systems, patient-centered design is a way to make sure that systems mirror the life experience, preference, and anticipation of end-users (Pawelek *et al.*, 2022).

Research highlights that patient engagement in the process of EHR system development and evaluation contributes to a significant improvement in the level of satisfaction, implementation, and trust in the healthcare process. Co-design strategies help enhance the technical-functionality-patient fit, such as streamlining portal interfaces, supporting legibility of health data, and incorporating functionality of customized feedback and communication (de la Torre *et al.*, 2025).

In addition, design is only one of the aspects of patient engagement, with shared decision-making and self-management interactions. Sensitization to enable patients to access and interpret their health information is a way of fostering accountability and ongoing participation especially in chronic illnesses in which lifetime patient commitment and lifestyle change are important in enhancing good/desirable results.

4.4. Theme 3: Barriers and Facilitators in System Adoption

Patient-centered digital health systems implementation is a complex process that is determined by technical, organizational, and human factors.

i. Technical barriers are lack of interoperability between different EHR systems, standard data formats, lack of cybersecurity, and high maintenance. The lack of a fluent data transfer between the clinics and the healthcare facilities constrains the possible power of EHRs to promote integrated care (Tsai *et al.*, 2020).

ii. Commonly found organizational barriers include resistance to change, lack of leadership support and lack of alignment between system functionality and current clinical processes. Failure to invest in both the training and infrastructure tendencies of institutions may lower staff buy-in and project delays (Cheraghi *et al.*, 2023).

iii. Social obstacles, including, but not limited to, low digital literacy, clinician burnouts, and information overload are further limiting factors impeding system adoption and successful use (Rodrigues *et al.*, 2024).

Conversely, facilitators that were found in the literature publications are dedication to effective leadership, interdepartmental working, ongoing training, and elucidation of the advantages of the systems to all stakeholders. Notably, the projects which incorporate feedback loop involving the end-users and the continual technical support reportingly become more sustainable and with a high level of satisfaction.

All these results help to emphasize that the effective use of digital health cannot be achieved through technological preparedness only and requires a sociotechnical fit between individuals, processes, and technology.

4.5. Theme 4: Linking Implementation Processes to Chronic Disease Outcomes

Literature synthesis has revealed that the managed and patient-centered digital health implementations yield both quantifiable effects on chronic disease outcomes. Research indicates that in cases where EHR systems are successfully implemented and used, they are used to make early diagnoses, provide ongoing chronic conditions management, and to make evidence-based decisions regarding the conditions, in this case, diabetes, heart failure, chronic kidney disease (Brands *et al.*, 2022). As an example, integrated digital platforms facilitate clinical data exchange across multidisciplinary teams which ensures continuity of care and minimizes readmission to the hospital. Also, patient self-tracking tools as well as remote monitoring, in diabetic patients and medication adherence in hypertensive populations, respectively, have been linked to enhanced glycemic control and improved medication adherence, respectively (Lawal *et al.*, 2025; Shehu *et al.*, 2025).

Nevertheless, the advantages depend on the quality of the implementation process, as the projects with strong governance, stakeholder involvement, and patient-centered design are always effective in contrast to projects with the tendency to implement technical deployment only. Therefore, the literature sources confirm that successful project management does not only have an impact on organizational efficiency but also carries over to better health outcomes and satisfaction of patients.

4.6. Emerging Trends and Innovations

The evolution of newer technological advances in the healthcare industry implies a shift in the paradigm towards intelligent, interconnected, and patient responsive systems. Predictive analytics in EHRs powered by Artificial Intelligence (AI) and machine learning has the potential to make predictions and prioritize risk patients based on the associated risks, and then

use proactive interventions to address chronic mental illnesses (Lawal *et al.*, 2025).

The process of telemonitoring and remote patient management is becoming integrated with the EHR platform and enables the possibility of real-time data gathering and the reactions of a clinician beyond the conventional healthcare setting. This strategy has been advantageous especially in the treatment of cardiovascular-related diseases and diabetes where periodic check-ups help in early treatment (Serrano *et al.*, n.d.).

Moreover, data interoperability platforms like the Fast Healthcare Interoperability Resources (FHIR) standard are also improving data sharing among healthcare systems, which leads to the coordinated and efficient care. Similar to this, the development of an interest in the new topic of digital equity and access is also reflected in the literature, where technological innovation should be coupled with exerting influence and efforts to minimize the existence of digital literacy and access gaps between vulnerable groups. A combination of the trends supports the concept of adaptive and progressive project management concepts that can incorporate a growing range of technologies without abandoning patient-focused values (Vorisek *et al.*, 2022).

A summary of the key themes identified through the narrative synthesis is presented in Table 2.

Table 2. Summary of Key Themes Identified in the Narrative Review

Theme	Key Findings	Representative Sources
Theme 1: Effective Project Management Practices in Digital Health Implementation	Structured and hybrid project management models (combining agile and traditional approaches) improve coordination, adaptability, and accountability in healthcare IT projects. Effective leadership and stakeholder engagement are critical for success.	(Chen *et al.*, 2025; Cristina *et al.*, 2024)
Theme 2: The Role of Patient Engagement and Co-Design	Involving patients and clinicians in co-design enhances usability, trust, and sustained adoption. User-centered systems lead to better self-management and satisfaction among chronic disease patients.	(Grindell *et al.*, 2022)
Theme 3: Barriers and Facilitators in System Adoption	Major barriers include data interoperability, privacy concerns, workflow misalignment, and limited digital literacy. Facilitators include continuous training, leadership support, and strong communication strategies.	(Borges do Nascimento *et al.*, 2023; Rodrigues *et al.*, 2024).
Theme 4: Linking Implementation Processes to Chronic Disease Outcomes	Successful implementation correlates with improved adherence, care coordination, and health outcomes. Patient engagement and data integration are mediating factors.	(Keelson *et al.*, 2024)
Theme 5: Emerging Trends and Innovations	Artificial intelligence, telemonitoring, and interoperability frameworks are redefining digital health delivery. These technologies demand flexible management and governance structures.	(Faiyazuddin *et al.*, 2025; Olawade *et al.*, 2024)

Note. This table summarizes the major thematic findings synthesized from the reviewed literature on digital health implementation and chronic disease management.

4.7. Discussion

4.7.1. Interpretation of Findings

The results of this review indicate that effective practice of project management, patient-centered design, and successful implementation of digital health record system have a complex relationship in order to rescue better outcomes of chronic diseases. The overall synthesized themes imply that technology, in itself, cannot lead to imparting any significant change to the healthcare sphere, but instead, this success is determined by the structured and modular as well as integrative approaches to management capable of aligning technical innovation with human and organizational variables.

The implementation of project management concepts into the digital health strategies is instrumental in making the processes of implementation systemic, transparent and goal-oriented. The governance and accountability of structures like PMBOK and PRINCE2 and the flexibility, continual feedback, and responsiveness of agile approaches to new requirements illustrate structures that promote flexibility and continuous feedback and responsiveness to the evolving demands. The combination and contextualization of those approaches to healthcare settings helps organizations predict hazards, use resources efficiently, and synchronize the interests of different stakeholders (Simonaitis *et al.*, 2023).

This emphasis on embracing patient-centered values through the lifecycle of a project is also reflected in the literature. Conventional EHR initiatives are based on compliance and technical capabilities more frequently than usability and patient interaction. Nonetheless, it has been proven that the involvement of patients and clinicians into system design and assessment as active stakeholders leads to an increase in the rates of adoption and satisfaction. Therefore, the gap that has always existed between the potential of technology and the health results within a practical environment can be narrowed by the unification of project management models with participatory and human-centered design cycles (Pawelek *et al.*, 2022).

Primarily, a strategic learning approach to project management, which celebrates leadership, communication, and patient involvement, is the driving force of a long-term digital health innovation. Such alignment holds true in that the digital health records systems are not only technically viable but also socially and clinically significant.

4.7.2. Proposed Strategic Project-Management Framework

Based on thematic synthesis, this review suggests a thematic project-management model that incorporates a traditional project management life cycle with patient-focused care concepts. The model will help healthcare organizations to take a well-organized but adjustable journey toward the implementation and maintenance of digital health record systems.

1. Initiation Phase:

• State vision, objectives, and scope of the project clearly in terms of the chronic disease management objectives.

• Involve the critical stakeholders at an early stage such as clinicians, patients, administrators, and IT specialists.

• Minimize needs assessment to determine the needs of technology, organization, and patient needs (Cristina *et al.*, 2024).

2. Planning Phase:

• Work out a comprehensive project plan including timetables, resources, risk management and communication plans.

• Include co-design workshops and focus groups to advocate that patient and clinician views are used to specify systems.

• Determine quantifiable success metrics associated with usability, adoption and patient outcomes (Mısıroluoğlu, 2024).

3. Execution Phase:

• Introduce the system in iterative phases with agile practices in place that would enable modification of the system on the basis of user preferences.

• Effective communication in multidisciplinary teams during practice should be maintained to regulate emerging technical and clinical problems.

• Offer life-long training and educating to improve competence and confidence of users (Ndou *et al.*, 2024).

4. Monitoring and Evaluation Step:

• Measure progress of the projects according to established parameters, such as user satisfaction, workflow integration, and clinical impact.

• Utilize dashboards and feedback loops to attain real-time patient and provider data.

• Dynamically enhance functionality, interoperability, and engagement through adjusting the strategies (Helminski *et al.*, 2024).

5. Activities done in the closure and sustainability stage will include:

• There should be post implementation reviews to review lessons learned and prepare best practices.

• Institutionalize feedback systems on patients and clinicians to enhance the system continuously.

• Scalability, long term maintenance, and alignment to changing health technology standards (Kwan *et al.*, 2022).

Stakeholder Roles:

• Clinicians act as champions of adoption and make it so that systems match clinical work.

• Co-designers and evaluators are also a feature of the patients and thus systems are designed to be responsive to real-world requirements.

• IT teams could offer technical experience, cybersecurity, and interoperability of the system.

• The policymaker and administrators develop favorable regulatory and financing conditions to maintain the innovation (Russell *et al.*, 2024).

The given framework focuses on feedback, adaptation, and sustainability as the key success mechanisms. Continuous evaluation and participatory design are not incidental actions but part of the overall system effectiveness in the long run. As shown in Figure 1, the proposed Strategic Project-Management Framework brings the traditional project management steps in line with the concept of patient-centered care. The model focuses on the constant feedback, cooperation of stakeholders and continuous improvement during the project life cycle.

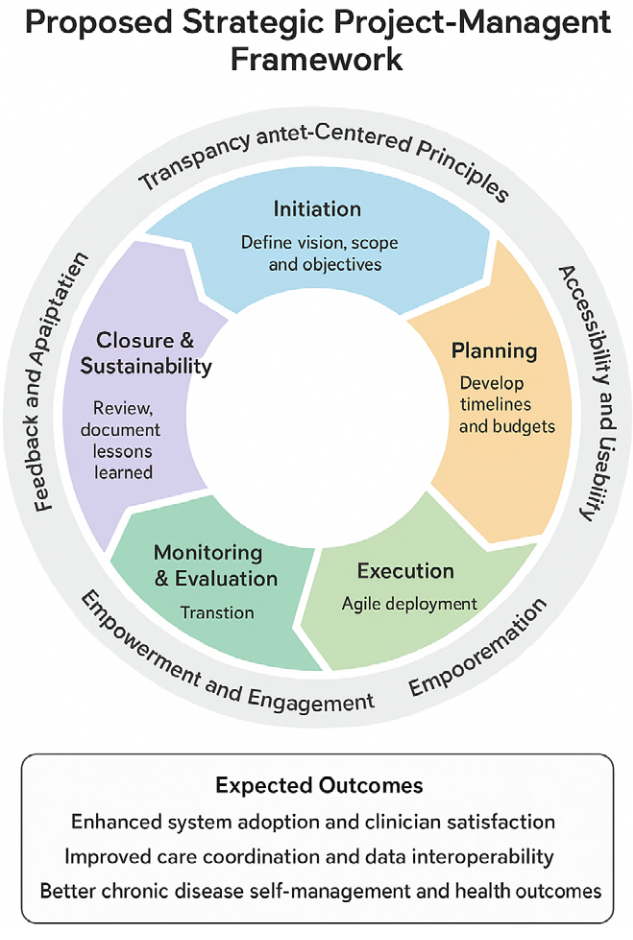

Figure 1. Proposed strategic project-management framework integrating traditional and agile methodologies with patient-centered design principles for implementing digital health record systems to improve chronic disease outcomes.

4.8. Applied Example: Implementing a Patient-Centered Diabetes Management System

To illustrate the practical application of the proposed framework, consider a large urban hospital planning to implement a digital diabetes management platform integrated with its existing electronic health record (EHR) system.

• *Initiation Phase:* The project begins with defining goals reducing hospital readmissions and improving glycemic control. Stakeholders include clinicians, IT professionals, patient advocates, and administrators.

• *Planning Phase:* Using co-design workshops, clinicians and patients collaborate to identify key features such as real-time glucose tracking, automated alerts, and simplified patient dashboards. A hybrid project management plan is developed, combining PMBOK's structured governance with agile sprints for iterative design testing.

• *Execution Phase:* The IT team develops the system in incremental modules, conducting usability testing with diabetic patients after each sprint. Feedback is integrated to improve accessibility and engagement features.

• *Monitoring and Evaluation:* Performance metrics patient portal use, appointment adherence, and HbA1c outcomes are tracked via dashboards.

• *Closure and Sustainability:* After launch, feedback loops remain active through quarterly patient surveys, ensuring ongoing improvement and system scalability.

This scenario demonstrates how structured project management processes can coexist with patient-centered co-design principles to deliver a sustainable, outcome-oriented digital health solution.

4.9. Policy and Practice Implications

These implications may be summarized with various implications on policy and healthcare practice with the incorporation of the structured project management and patient-centered principles.

To healthcare leaders, the implementation of this strategic framework can help them to achieve more efficiency in their implementation, decrease expenses of systems failure and increase consumer satisfaction. The institutionalization of governance, oversight, and accountability (Neumann & Purdy, n.d.) could be performed through embedding project management offices (PMOs) within health organizations.

An important contribution to standardization, interoperability, and patient involvement is made by policy-makers or national health authorities and agencies, including the Centers for Medicare and Medicaid Services (CMS) and the Office of the National Coordinator for Health Information Technology (ONC). The policymakers need to focus on:

• Setting up and implementing of national standards of interoperability and data governance.

• Offering reward programs to healthcare institutions that implement patient-centered design and participatory project management solutions.

• Promoting the competencies of managing the project among professionals in the healthcare sector through supporting capacity-building initiatives (Luduşanu *et al.*, 2025).

On the practice level, the practice of implementation must introduce hybrid project management models in accordance with the specificities of the healthcare sector and invest in training programs to develop technical and people-oriented skills of the staff. By summing these measures together, a stronger association of increased chronic disease outcomes is enhanced by digital innovation.

4.10. Strengths and Limitations of the Review

One of the strengths of this narrative review is the breadth of its concepts and synthesis. It offers a comprehensive picture of the multi-layered aspects affecting the digital health implementation by relying on the sources of Project management, health informatics, and patient-centered care. The narrative review approach was also flexible hence permitted the use of as many literature sources as possible, including policy documents and conceptual papers, which boosted the quality of analysis.

Nonetheless, there are some weaknesses that have to be noted. Due to the lack of systematic review, the study is prone to the possible selection bias and might have missed all the publications of the area of concern. There is no quantitative synthesis, which prevents it to generalize the findings and quantify effects of interventions. Moreover, secondary data usage creates a variance in the quality of the methods used in different sources.

Nevertheless, the narrative review, despite all mentioned limitations, contains essential ideas of how project management and patient-centered principles can be aligned on a strategic level to form the basis of the future empirical studies, on which a comprehensive framework could be built and tested.

5. CONCLUSION

This narrative review examined the integration of project management within the context of patient-centered design in the adoption of digital health record systems to enhance the outcomes of chronic diseases in the United States. Literature synthesis showed that although electronic health technologies including Electronic Health Records (EHRs) and integrated care platforms have completely changed the nature of the healthcare sector, the effectiveness of the implementation, management, and alignment with user requirements can determine the success of digital health technologies.

The greatest opportunity this review provided is that technical innovation is not good enough to bring significant change to healthcare. Rather, structures of project management practices combined with patient-focused strategies offers a potent model of organizational digital health implementation. Best project management guarantees the planning discipline, risk control, and stakeholder alignment whereas the patient-centered design can support usability, engagement, and continued adoption. Digital systems have a higher chance of improving the care coordination and empower in self-management, and produce measurable chronic disease outcomes as they incorporate the two dimensions.

The proposed strategic project-management model highlights the need to integrate patient and clinician involvement across the project lifecycle, such as initial efforts to initiate the project to the evaluation phase, and establish the feedback mechanism to keep refining the system. By organizing project governance

in line with the concepts of human-centered design, healthcare companies will become more successful in their implementation, decrease the likelihood of opposition to change, and make sure that the investments in digital health are converted into the visible gains, both to the patients and their providers.

In the future, artificial intelligence, telemonitoring, and interoperability standards will be the perspectives of the implementation of digital health in the United States. Nonetheless, fascinating is that the most pressing issue will persist unchanged: the implementation of technological advanced control and patient-centered care. In order to address this challenge, healthcare executives would have to develop adaptive project management skills, even encourage cross-sector cooperation, and institutionalize the practice of participatory design.

To sum up, the digital system deployment is not just a path to a better chronic disease outcome, but a strategy-driven management and the development of digital systems revolving around people served should be considered as the way to achieve better outcomes. Combining the rigor of project management with patient-based innovation should present a stable, fair, and futuristic underpinning of digital health systems in the United States next generation.

RECOMMENDATIONS

For Healthcare Systems and Project Managers

Any healthcare facility willing to deploy or improve digital health records systems would want to adopt hybrid project management frameworks that take the form of traditional project management approaches (including PMBOK or PRINCE2), but entails the flexibility inherent in agile methodologies. This hybridization enables strict planning, accountability, and documentation and at the same time enables responsiveness to the dynamic clinical environment and user needs.

It is imperative to include patient feedback loops, on every stage of the project create, i.e. requirements collection and design and post-implementation appraisal. The approach of making patients co-designers and evaluators is essential to make sure systems are based on workflow and usability expectations in the real world and thus enhance acceptability, satisfaction, and continued engagement. Continuous staff training, interprofessional cooperation, and open communication are also among the priorities of project managers that should establish trust and keep the implementation process on schedule.

For Policymakers

Digital health transformation depends on the policy environment to develop structures and regulations that will ensure success. The health authorities of the country and the states must enhance and intensify interoperability and standardization efforts, so that the health information systems can properly transfer data safely and effectively through various providers and environments.

Additionally, the continuous funding of patient-centered digital innovation plans will be required. Investment in the category should focus on projects that can show a positive engagement of the patient, usability, and reduction in chronic disease management outcomes. There should also be policy frameworks that incentivize the organizations that incorporate formal project management practices in the process of implementing digital health as well as those organizations that show evidence of participatory and outcome-guided implementation.

For Future Research

The given project logical strategic project-management framework is supposed to be tested in practical healthcare conditions via empirical validation by the future research. Mixed-method or case-based researches may offer useful data regarding the impact that project management rigor and patient-centered design structures have on adoption, sustainability, and health outcomes when utilized simultaneously.

Besides, longitudinal studies should be used to determine the relationship between the quality of project management, performance of the digital system, and chronic disease outcomes over a long term. These studies would assist in defining what aspects of project management have the most significant effects on clinical and operation success and eventually help attain best practices evidence-based to implement digital health.

REFERENCES

Ahmed, M. M., Okesanya, O. J., Olaleke, N. O., Adigun, O. A., Adebayo, U. O., Oso, T. A., Eshun, G., & Don Eliseo Lucero-Prisno, I. I. I. (2025). Integrating Digital Health Innovations to Achieve Universal Health Coverage: Promoting Health Outcomes and Quality Through Global Public Health Equity. *Healthcare, 13*(9), 1060. https://doi.org/10.3390/healthcare13091060

Almalki, S. S. (2025). AI-Driven Decision Support Systems in Agile Software Project Management: Enhancing Risk Mitigation and Resource Allocation. *Systems, 13*(3), 208. https://doi.org/10.3390/systems13030208

Alomar, D., Almashmoum, M., Eleftheriou, I., Whelan, P., & Ainsworth, J. (2024). The Impact of Patient Access to Electronic Health Records on Health Care Engagement: Systematic Review. *Journal of Medical Internet Research, 26*, e56473. https://doi.org/10.2196/56473

Borges do Nascimento, I. J., Abdulazeem, H., Vasanthan, L. T., Martinez, E. Z., Zucoloto, M. L., Østengaard, L., Azzopardi-Muscat, N., Zapata, T., & Novillo-Ortiz, D. (2023). Barriers and facilitators to utilizing digital health technologies by healthcare professionals. *NPJ Digital Medicine, 6*, 161. https://doi.org/10.1038/s41746-023-00899-4

Brands, M. R., Gouw, S. C., Beestrum, M., Cronin, R. M., Fijnvandraat, K., & Badawy, S. M. (2022). Patient-Centered Digital Health Records and Their Effects on Health Outcomes: Systematic Review. *Journal of Medical Internet Research, 24*(12), e43086. https://doi.org/10.2196/43086

Carney, T. J., Wiltz, J. L., Davis, K., Briss, P. A., & Hacker, K. (2023). Advancing Chronic Disease Practice Through the CDC Data Modernization Initiative. *Preventing Chronic Disease, 20*, E110. https://doi.org/10.5888/pcd20.230120

Chen, M., Martins, T. S., Zhang, L., Dong, H., Chen, M., Martins, T. S., Zhang, L., & Dong, H. (2025). Digital Transformation in Project Management: A Systematic Review and Research Agenda. *Systems, 13*(8). https://doi.org/10.3390/systems13080625

Cheraghi, R., Ebrahimi, H., Kheibar, N., & Sahebihagh, M. H. (2023). Reasons for resistance to change in nursing: An integrative review. *BMC Nursing, 22*, 310. https://doi.org/10.1186/s12912-023-01460-0

Cristina, M., Nogueira, P., Oliveira, M. M., & Santos, C. (2024). Project management in healthcare: An examination of organizational competence. *Heliyon, 10*(15), e35419. https://doi.org/10.1016/j.heliyon.2024.e35419

de la Torre, E., Montane, C., Rubio, O., Sampietro-Colom, L., Camacho-Mahamud, A., & Grau-Corral, I. (2025). Integrating Patient Perspectives Into the Digital Health Technology Readiness Framework: Delphi Study. *Journal of Medical Internet Research, 27*, e71600. https://doi.org/10.2196/71600

Eddoug, F.-Z., Benabbou, R., Ahlaqqach, M., Benhra, J., Eddoug, F.-Z., Benabbou, R., Ahlaqqach, M., & Benhra, J. (2025). Introducing a New Hybrid Project Management Framework for Moroccan Enterprises. *Engineering Proceedings, 97*(1). https://doi.org/10.3390/engproc2025097011

Edgman-Levitan, S., & Schoenbaum, S. C. (2021). Patient-centered care: Achieving higher quality by designing care through the patient's eyes. *Israel Journal of Health Policy Research, 10*, 21. https://doi.org/10.1186/s13584-021-00459-9

Efthymiou, E. (2025). Integrating digital and narrative medicine in modern healthcare: A systematic review. *Medical Education Online, 30*(1), 2475979. https://doi.org/10.1080/10872981.2025.2475979

Egwudo, A. E., Jegede, A. O., Oyeniyi, T. A., Ezekwelu, N. J., Abdu-Aguye, S. N., Okwuraiwe, A. P., Onyeaghala, C. A., Ozoude, T. O., Suleiman, M. O., Aziken, G. O., Okeke, O. P., Abodunrin, O. R., Eleje, G. U., Akinsolu, F. T., & Sobande, O. O. (2025). Integrating digital health technologies into the healthcare system: Challenges and opportunities in Nigeria. *PLOS Digital Health, 4*(7), e0000928. https://doi.org/10.1371/journal.pdig.0000928

Enabulele, A. B. O., Ojo, D. A., Egwatu, J. O., & Thomas, G. A. (2025). AI-Augmented Agility: A Comprehensive Review of Generative AI Applications in Agile Project Management. *Journal of Global Economics, Management and Business Research, 17*(3), 349–360. https://doi.org/10.56557/jgembr/2025/v17i39877

Enabulele, A. B. O., Omo-Enabulele, A. P., Borokinni, M., Iwerumoh, A. N., Olatunbosun, A., Enobakha, B. O., & Ifionu, E. S. (2025). Agile Leadership in Hybrid Workplaces: Evolving Roles and Competencies of Project Managers. *Journal of Global Economics, Management and Business Research, 17*(3), 211–225. https://doi.org/10.56557/jgembr/2025/v17i39756

Faiyazuddin, Md., Rahman, S. J. Q., Anand, G., Siddiqui, R. K., Mehta, R., Khatib, M. N., Gaidhane, S., Zahiruddin, Q. S., Hussain, A., & Sah, R. (2025). The Impact of Artificial Intelligence on Healthcare: A Comprehensive Review of Advancements in Diagnostics, Treatment, and Operational Efficiency. *Health Science Reports, 8*(1), e70312. https://doi.org/10.1002/hsr2.70312

Grindell, C., Coates, E., Croot, L., & O'Cathain, A. (2022). The use of co-production, co-design and co-creation to mobilise knowledge in the management of health conditions: A systematic review. *BMC Health Services Research, 22*, 877. https://doi.org/10.1186/s12913-022-08079-y

Hacker, K. (2024). The Burden of Chronic Disease. *Mayo Clinic Proceedings: Innovations, Quality & Outcomes, 8*(1), 112. https://doi.org/10.1016/j.mayocpiqo.2023.08.005

Helminski, D., Sussman, J. B., Pfeiffer, P. N., Kokaly, A. N., Ranusch, A., Renji, A. D., Damschroder, L. J., Landis-Lewis, Z., & Kurlander, J. E. (2024). Development, Implementation, and Evaluation Methods for Dashboards in Health Care: Scoping Review. *JMIR Medical Informatics, 12*, e59828. https://doi.org/10.2196/59828

Joo, J. Y. (2023). Fragmented care and chronic illness patient outcomes: A systematic review. *Nursing Open, 10*(6), 3460–3473. https://doi.org/10.1002/nop2.1607

Keelson, S. A., Addo, J. O., & Amoah, J. (2024). The impact of patient engagement on service quality and customer well-being: An introspective analysis from the healthcare providers' perspective. *Cogent Public Health, 11*(1), 2340157. https://doi.org/10.1080/27707571.2024.2340157

Kwan, B. M., Brownson, R. C., Glasgow, R. E., Morrato, E. H., & Luke, D. A. (2022). Designing for Dissemination and Sustainability to Promote Equitable Impacts on Health. *Annual Review of Public Health, 43*, 331–353. https://doi.org/10.1146/annurev-publhealth-052220-112457

Lawal, O., Oyebamiji, H. O., Kelenna, I. J., Chioma, F. J., Oyefeso, E., Adeyemi, B. I., Foster-Pagaebi, E., & Moses, E. F. (2025). A Review on Usage of Digital Health Literacy to Combat Antibiotic Misuse and Misinformation in Nigeria: Review Article. *Journal of Pharma Insights and Research, 3*(2), Article 2. https://doi.org/10.69613/dja1jc18

Lawal, O. P., Igwe, E. P., Olosunde, A., Chisom, E. P., Okeh, D. U., Olowookere, A. K., Adedayo, O. A., Agu, C. P., Mustapha, F. A., Odubo, F., & Orobator, E. T. (2025). Integrating Real-Time Data and Machine Learning in Predicting Infectious Disease Outbreaks: Enhancing Response Strategies in Sub-Saharan Africa. *Asian Journal of Microbiology and Biotechnology, 10*(1), 147–163. https://doi.org/10.56557/ajmab/2025/v10i19371

Ludușanu, D.-G. S., Fertu, D.-I., Tinică, G., Gavrilescu, M., Ludușanu, D.-G. S., Fertu, D.-I., Tinică, G., & Gavrilescu, M. (2025). Integrated Quality and Environmental Management in Healthcare: Impacts, Implementation, and Future

Directions Toward Sustainability. *Sustainability, 17*(11). https://doi.org/10.3390/su17115156

McDermott, O., Antony, J., Bhat, S., Jayaraman, R., Rosa, A., Marolla, G., Parida, R., McDermott, O., Antony, J., Bhat, S., Jayaraman, R., Rosa, A., Marolla, G., & Parida, R. (2022). Lean Six Sigma in Healthcare: A Systematic Literature Review on Motivations and Benefits. *Processes, 10*(10). https://doi.org/10.3390/pr10101910

Mısırlıoğlu, A., & Murt, E. (2024). Project management approach in healthcare services. *Journal of Law and Sustainable Development, 12*(7), e3798–e3798. https://doi.org/10.55908/sdgs.v12i7.3798

Modi, S., & Feldman, S. S. (2022). The Value of Electronic Health Records Since the Health Information Technology for Economic and Clinical Health Act: Systematic Review. *JMIR Medical Informatics, 10*(9), e37283. https://doi.org/10.2196/37283

Moghaddasi, S., Kordani, K., Sarvari, H., & Rashidi, A. (2025). Redefining Project Management: Embracing Value Delivery Offices for Enhanced Organizational Performance. *Buildings, 15*(7), 1176. https://doi.org/10.3390/buildings15071176

Ndou, V., Ingrosso, A., & Di Girolamo, A. (2024). Framework for Agile Transformation: Guiding Organizations Through Cultural, Structural, and Competency Shifts in Project Management. *Administrative Sciences, 14*(11), 301. https://doi.org/10.3390/admsci14110301

Negro-Calduch, E., Azzopardi-Muscat, N., Krishnamurthy, R. S., & Novillo-Ortiz, D. (2021). Technological progress in electronic health record system optimization: Systematic review of systematic literature reviews. *International Journal of Medical Informatics, 152*, 104507. https://doi.org/10.1016/j.ijmedinf.2021.104507

Neumann, W. P., & Purdy, N. (n.d.). The better work, better care framework: 7 strategies for sustainable healthcare system process improvement. *Health Systems, 12*(4), 429–445. https://doi.org/10.1080/20476965.2023.2198580

Olakotan, O., Samuriwo, R., Ismaila, H., & Atiku, S. (2025). Usability Challenges in Electronic Health Records: Impact on Documentation Burden and Clinical Workflow: A Scoping Review. *Journal of Evaluation in Clinical Practice, 31*(4), e70189. https://doi.org/10.1111/jep.70189

Olawade, D. B., David-Olawade, A. C., Wada, O. Z., Asaolu, A. J., Adereni, T., & Ling, J. (2024). Artificial intelligence in healthcare delivery: Prospects and pitfalls. *Journal of Medicine, Surgery, and Public Health, 3*, 100108. https://doi.org/10.1016/j.glmedi.2024.100108

Pawelek, J., Baca-Motes, K., Pandit, J. A., Berk, B. B., & Ramos, E. (2022). The Power of Patient Engagement With Electronic Health Records as Research Participants. *JMIR Medical Informatics, 10*(7), e39145. https://doi.org/10.2196/39145

Rodrigues, D. A., Roque, M., Mateos-Campos, R., Figueiras, A., Herdeiro, M. T., & Roque, F. (2024). Barriers and facilitators of health professionals in adopting digital health-related tools for medication appropriateness: A systematic review. *Digital Health, 10*, 20552076231225133. https://doi.org/10.1177/20552076231225133

Russell, D., Sharma, Y., Ambrosy, A. P., Axsom, K., Chaiyasit, J. J., Cuomo, M. O., Deaton, C., Goldberg, A. J., Goyal, P., Guan, A., Polubriaginof, F. C. G., McGurk, L., Sandhu, A. T., Spertus, J. A., Turchioe, M. R., Vawdrey, D. K., & Creber, R. M. (2024). Stakeholder Perspectives on the Meaningful Integration of Clinical Informatics Interventions Using Patient-Reported Outcomes in Healthcare. *ACI Open, 8*(2), e79–e88. https://doi.org/10.1055/a-2461-3027

Serrano, L. P., Maita, K. C., Avila, F. R., Torres-Guzman, R. A., Garcia, J. P., Eldaly, A. S., Haider, C. R., Felton, C. L., Paulson, M. R., Maniaci, M. J., & Forte, A. J. (n.d.). Benefits and Challenges of Remote Patient Monitoring as Perceived by Health Care Practitioners: A Systematic Review. *The Permanente Journal, 27*(4), 100–111. https://doi.org/10.7812/TPP/23.022

Shehu, H., Sunday, O., Ojo, D. A., Afolayan, O. N., Adebanjo, T. A., Eromosele, E. I., Enabulele, A. B. O., Okpoko, O. A., Okeke, F. C., & Enobakhare, B. O. (2025). Conceptual Framework for Smart Sensor–driven Predictive Maintenance in Infrastructure Management. *Journal of Engineering Research and Reports, 27*(9), 25–40. https://doi.org/10.9734/jerr/2025/v27i91623

Simonaitis, A., Daukšys, M., Mockienė, J., Simonaitis, A., Daukšys, M., & Mockienė, J. (2023). A Comparison of the Project Management Methodologies PRINCE2 and PMBOK in Managing Repetitive Construction Projects. *Buildings, 13*(7). https://doi.org/10.3390/buildings13071796

Sony, M., Antony, J., & Tortorella, G. L. (2023). Critical Success Factors for Successful Implementation of Healthcare 4.0: A Literature Review and Future Research Agenda. *International Journal of Environmental Research and Public Health, 20*(5), 4669. https://doi.org/10.3390/ijerph20054669

Ștefan, A.-M., Rusu, N.-R., Ovreiu, E., Ciuc, M., Ștefan, A.-M., Rusu, N.-R., Ovreiu, E., & Ciuc, M. (2024). Empowering Healthcare: A Comprehensive Guide to Implementing a Robust Medical Information System—Components, Benefits, Objectives, Evaluation Criteria, and Seamless Deployment Strategies. *Applied System Innovation, 7*(3). https://doi.org/10.3390/asi7030051

Tsai, C. H., Eghdam, A., Davoody, N., Wright, G., Flowerday, S., & Koch, S. (2020). Effects of Electronic Health Record Implementation and Barriers to Adoption and Use: A Scoping Review and Qualitative Analysis of the Content. *Life, 10*(12), 327. https://doi.org/10.3390/life10120327

Vorisek, C. N., Lehne, M., Klopfenstein, S. A. I., Mayer, P. J., Bartschke, A., Haese, T., & Thun, S. (2022). Fast Healthcare Interoperability Resources (FHIR) for Interoperability in Health Research: Systematic Review. *JMIR Medical*

Informatics, 10(7), e35724. https://doi.org/10.2196/35724

Walker, D. M., Tarver, W. L., Jonnalagadda, P., Ranbom, L., Ford, E. W., & Rahurkar, S. (2023). Perspectives on Challenges and Opportunities for Interoperability: Findings From Key Informant Interviews With Stakeholders in Ohio. *JMIR Medical Informatics, 11*, e43848. https://doi.org/10.2196/43848