Article

Embracing Digital Disruption: Using Design Thinking for Digital Transformation of Healthcare Services

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Abstract

This article investigates the application of design thinking in the digital transformation of healthcare services. The healthcare industry, which directly impacts everyone, often faces life-or-death situations depending on service quality. Our study delves into how design thinking facilitates the digital transformation of healthcare services, leading to significantly improved patient outcomes and healthcare infrastructure compared to traditional methods. This article critically analyses existing literature and reviews case studies conducted by leading consulting firms to derive key insights and analyses on the phenomenon. It provides real anecdotal evidence to bridge the gap between theory and practice, offering a comprehensive understanding of how design thinking can effectively drive digital transformation in healthcare services. The findings reveal that digitization leveraging design thinking must go beyond the obvious and actively engage participants throughout the journey. It underscores the importance of cross-functional teams collaborating from the early stages of the design process. Additionally, the study highlights the value of recognizing all ideas, even those that may initially seem unconventional. Finally, involving end users early on can lead to benefits and outcomes emerging much sooner than anticipated. This research provides valuable insights into the concept of design thinking and its role in fostering digital transformation. It contributes to the literature by delving deeply into the "how" question, offering pragmatic insights that can significantly enhance outcomes. Additionally, the study presents practical examples and case studies that illustrate the effective application of design thinking in real-world healthcare settings.

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Keywords

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Introduction

As traditional silos break, companies require innovative solutions to transform from industrial to digital organization. With increased environmental VUCA, top leadership must hear and act across the various facets of the organization to drive innovation. Due to the digitization wave, the business environment is changing quickly—industries are converging, boundaries are diffusing, new avenues are emerging, and legacy engagement processes are redefined. Digital disruption is making companies evaluate these imminent threats and prospects to create new business options for the future (Chan et al., 2019).

Digital transformation integrates various aspects of the digital levers available to redesign the operating models—how firms create value and deliver value to their end customers—making products and services more affordable and accessible (Asadullah et al., 2018). It requires initial investments in infrastructure, skills, resource-matching, projects, infrastructure, and a significant overhaul of the existing systems. Integrating people, devices, and business practices makes it a complicated process. Such transformation requires continued cooperation and dialogue between digital and non-digital business heads, allowing them to make informed decisions about their turnaround efforts (Davenport & Westerman, 2018). While most companies endeavor to leapfrog digital gaps, the resources remain engaged in fulfilling operational requirements since IT systems are rigid. Thus, digital transformation is like redesigning and rebuilding major infrastructure while ensuring that day-to-day operations run smoothly (Beswick, 2017). Remaining stuck in the legacy systems has negative impacts on their performance. A recent study (Kraus et al., 2022) found that incumbent firms that ignore embracing digital show a depletion of almost half of revenue growth and one-third of earnings growth. Our research focuses on the healthcare delivery context, as that has been one of the most critical settings for digital transformation. However, the learnings apply to other industries as well. We advocate using design thinking to facilitate the digital transformation process.

This article investigates the application of design thinking in the digital transformation of healthcare services. The healthcare industry, which directly impacts everyone, often faces life-or-death situations depending on service quality (Lorkowski et al., 2021). Our study delves into how design thinking facilitates the digital transformation of healthcare services, leading to significantly improved patient outcomes and healthcare infrastructure compared to traditional methods.

This article critically analyses existing literature and reviews case studies conducted by leading consulting firms to derive critical insights and analyses. It provides objective anecdotal evidence to bridge the gap between theory and practice, offering a comprehensive understanding of how design thinking can effectively drive digital transformation in healthcare services.

Methodology

Mixed Methods

The systematic literature review used both quantitative and qualitative studies, and is classified as a mixed method review, following on from the definition followed by Joanna Briggs Institute. The mixed method review allows us to review various levels of complex and ambiguous questions and the possibility of combining findings in different ways. Healthcare comprises complex systems, structures and cultures having high stakes at times, which can be a matter of life and death, with industry needing proof of success rather than a proof of concept that works often comes as a detriment as it shows a lack of synergy between the firms and healthcare issues which they intend to solve (Walsh & Rumsfeld, 2017). To ensure the validity and reliability of the mixed methods review, we followed the guidelines of Joanna Briggs's model for the same. We formulated specific research questions to focus on the sampling and search strategy.

Research Gaps & Research Objectives

As part of our detailed literature review, we found out that while the need for digital transformation in healthcare has seen significant academic interest, the challenges or struggles which healthcare providers face in implementing digital technologies have had limited academic interest to date. There is also minimal research which has explored how design thinking specifically impacts the digital transformation of healthcare services, bridging the gaps between theory and practical implications. Additionally, the literature lacks detailed insights into how digital initiatives help overcome operational rigidities and numerous constraints posed by legacy systems within healthcare settings. This interplay between design thinking and successful implementation of digital ecosystems in and interesting area of research, which has largely remained underexplored. So, the objective of the research is to look deeper into the phenomenon, understand the challenges which healthcare providers face and how by embracing design thinking, digital transformation of healthcare services can be successfully achieved.

Research Questions

The research question of this review was derived from an extensive review of the literature and after narrowing down the research gaps, we formulated the research objective. For this research, we narrowed down the following research questions:

1. To identify the specific challenges healthcare providers face in digital transformation.
2. To explore how design thinking can facilitate effective digital transformation in healthcare delivery organizations (HDOs).
3. To understand how digital initiatives help overcome operational rigidity posed by legacy healthcare systems.

Search Strategy

A detailed and comprehensive review was conducted using the guidelines set for systematic literature review. As part of this research, the following was used as a means of guidance. A search was conducted using EBSCO, Google Scholar databases, for the period of January 2010 to June 2024. Keywords included, in combination largely were: "digital transformation," "healthcare," "design thinking," "challenges," "opportunities," and "legacy systems."

However, many of the studies were omitted as they referred to other industries. All articles were independently reviewed by both researchers, who screened the articles separately, based on the inclusion criteria. Only research articles which met the strict inclusion criteria were included. In summary, the articles had to meet the following inclusion criteria:

1. To be focused on healthcare.
2. To articulate the role of digital transformation or digital initiatives in a healthcare setting.
3. To explore the role of design thinking for digital transformation in healthcare.
4. To be written in English.
5. To be published between January 2010 and June 2024.

The studies selected comprised a mix of both qualitative and quantitative studies.

Critical Appraisal of the Studies

All studies that met the inclusion criteria were critically evaluated by both the researchers on quality. Techniques like Joanna Briggs' Qualitative assessment (Stern et al., 2020) were also brought to use.

Data Extraction

The extracted data included titles, author details, abstract, methodology followed, findings and discussion, and conclusions. The data extraction was thoroughly checked by both researchers.

Wang et al. (2018) focused on how showcasing practice cases can further unlock opportunities to expand literature. We followed that by deep diving into leading consulting, analysts and vendor firms such as IBM, Accenture, hospitals, and clinicians. We followed a similar methodology for this study. Reviewing company case studies as part of academic research involves analysing real-world business scenarios to extract valuable insights. This method enables researchers to understand practical applications of theoretical concepts, identify best practices, and uncover challenges faced by companies. By examining detailed accounts of company strategies and outcomes, researchers can derive evidence-based conclusions that enrich academic knowledge and inform future business decisions.

In this research article, the author a practicing management consultant, also captures certain nuances of the work in which he was part for his client which are publicly referenceable and add additional context to the article.

We explored all the listed healthcare case studies across multiple consulting, strategy, and advisory firms and found very few that showcased success in a digital transformation journey. Analysis of the cases indicated that design thinking played a critical role in evolving the ideation process and the outcome.

Data Synthesis

Content analysis was used to synthesize the data. This involves carefully analysing the text for anecdotes or relevant narratives which can have implied meanings. We further followed the Gioia method to categorize these into themes and aggregate patterns. We also included as part of our analysis specific case studies which are unique and relevant to the application of design thinking for digital transformation in healthcare settings.

Theoretical Background

Digital Transformation Through Design Thinking

The existing incumbents suffer from the "strange anatomy of Big Bang disruption" (Downes & Nunes, 2014). Strategic business-related changes caused by incremental technology improvements are victimized because exponential technologies lead to significant disruptions. Such exponential technologies continuously lead to declining information and innovation costs, resulting in skewed and shorter industry and product life cycles. Digital disruption is a "big bang disruption" (Chan et al., 2019). Digital ecosystems are also transforming traditional industry structures and the nature and scope of firm interdependencies from completion to collaboration-focused. In healthcare, the future ecosystem is the intersection of legacy pharmaceutical firms and technology giants such as Google's Verily unit and IBM's Watson (Baidoo-Anu & Ansah, 2023). The need to adapt to digital ecosystems has pushed traditional companies to initiate digital transformation. Such transformation initiatives usually see many ups and downs. Challenges faced during digital transformation were experienced in several leading firms—GE, Lego, Procter & Gamble, and Ford (Davenport & Westerman, 2018). These companies spent billions of dollars on developing digital services, products, and infrastructures and receiving high media and investor attention; however, they faced severe performance challenges leading to shareholder wrath.

A recent research (Rösch et al., 2023) mentioned that the human-centered experience is fundamental to nurturing a firm's Digital IQ. Businesses must consider how their digital plans will impact customers and employees, as even the best-crafted initiatives can have unforeseen consequences. The challenges posed by the wave of digitization can be transformed into opportunities if firms utilize design thinking (Sussan et al., 2017). This approach can serve as a "Noah's Ark,"

guiding businesses through the turbulent conditions of digitization. By focusing on empathy and innovation, design thinking helps firms navigate and adapt to changes, ensuring that digital initiatives mitigate risks, enhance overall experiences, and propel growth in an evolving digital landscape.

"Design thinking is a creative, human-centred, participative, exploratory and problem-solving process that values different perspectives of a problem" (Bender-Salazar, 2023; Dunne & Martin, 2006). This method is increasingly becoming critical across companies. The "design lead" sometimes takes a seat in strategic planning meetings. This method is seen as a technique to help initiate and propagate creativity across ranks and files of digital organizations (Figure 1). By focusing on innovation as a social process, design thinking can help to shape and influence complex human systems. Design thinking challenges the underlying premise of the agent being rational by focusing on innovation as a social process intimately tied to human emotions and reliant on inexact methodologies in which humans collaborate and solutions emerge over time (Cross, 2023). Design thinking focuses on the end value created, focusing on "what" is to be created and "how" it will delight the end user (Rösch et al., 2023). Hackett's philosophy derived from design thinking was asking the right questions early on, which allows for the design of better products—and faster—through quicker decision-making. Thus, one of the challenges of digitization—digital transformation initiatives not generating value for firms—may be avoided using design thinking.

Organizations can fast-track digital transformation by using design thinking to observe and empathize with customers, interviewing them frequently to build insights into consumer experiences (Braun & Clarke, 2022). Digital experience data such as chat-log mining and clickstream provide critical inputs on customers' usage patterns and pain points. Data analysis can guide the designer in identifying pain zones and focusing on improving the consumption experience. Cross-discipline teams brainstorm solutions for identified problems—using a divergent-convergent approach—followed by rapid prototyping, which is tested on a sample

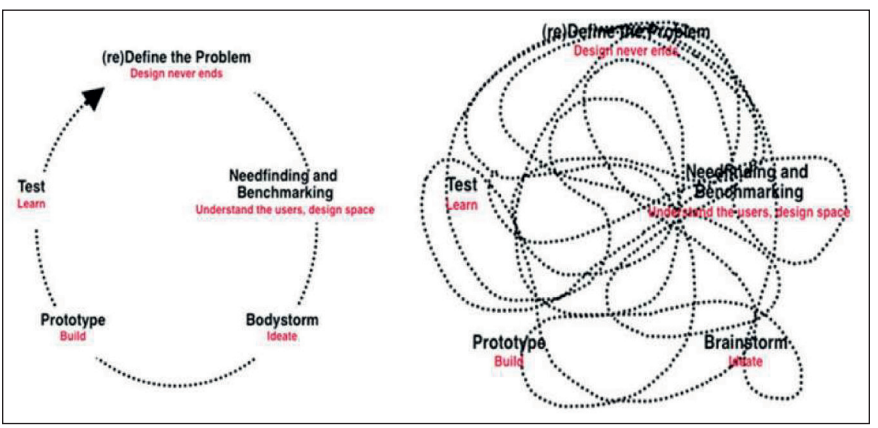

Figure 1. Iterative Engagement and Feedback Mechanism in Design Thinking.

Source: Design Thinking Research (Plattner et al., 2012).

set to receive feedback and for further iteration. The iterative cycle continues, focusing on delighting the consumer. Foundational behaviors are vital in developing a cognitive mindset before venturing into design thinking exercises (Cross, 2023). Some of the critical behaviors which need to be applied are—practicing empathy, eliminating silos, diverge than converging, ideating before assessing, listening actively, encouraging differences, and having unique ways of working (You, 2022).

Design thinking can be used to navigate the digital transformation process in HDOs, which has yet to show many positive results. Here, we discuss how design thinking exercises adopted by organizations help teams to think beyond the obvious and out of the box and seed creativity and innovation to build better products and services.

Healthcare Delivery—Need for Digital Transformation

Improving healthcare services' reach, affordability, effectiveness, and efficiency has become increasingly important for national and federal governments and private healthcare providers. Emerging customer preferences seeking more control and access to healthcare on their terms across multiple channels necessitate HDOs to speed up the digitization of their operation—across different activities of their value chain. HDOs have rising digital transformation aspirations but lack the capability needed. Multiple Gartner research reports (Kraus et al., 2022) prescribed an urgent need for healthcare providers to embrace digital transformation.

While healthcare has been witnessing increased spending, that has not led to increased value or innovation at the scale as in other industries (Rehman et al., 2022), the impact of healthcare IT on quality and efficiency has not shown positive results, highlighting that most health providers are not able to navigate the implementation process to convert investments into real paybacks (Agarwal et al., 2010).

Challenges of Digital Transformation in HDOs

While digital technologies over the past decade have been successful in consumer-driven sectors like telecom, media, and banking, one sector that continues to be a noticeable exception is healthcare (Iyanna et al., 2022). Despite massive investments in digital health services and technologies, both new ventures and reputed technology companies—healthcare delivery transformation still relatively lags other sectors. While we have seen the impact of digital firms—Facebook, Amazon, Apple, Netflix, and Google—we have yet to witness any significant impact of these firms on healthcare delivery. As seen in sectors like banking, media, and telecom, digital innovation can deliver similar value in healthcare (Iyanna et al., 2022). It can expand access and affordability of health services, improving efficiency and effectiveness across the value chain. Patients can be better off leveraging tools and services for self-health management and public health initiatives, which can be more effective with digital interventions. However, the sector has been slow to embrace these technologies (Rehman et al., 2022) that

have had far-reaching benefits for other sectors, as it is still trying to figure out deep-rooted problems concerning costs, access and quality of health, leading to all participants across the value chain—providers, payers, and patients being deprived of the benefits (Walsh & Rumsfeld, 2017). Key reasons identified for this lag of digital transformation in healthcare (Walsh & Rumsfeld, 2017) are:

1. Healthcare is complex; culture and structures must be established to absorb innovation.
2. Stakes are much higher; sometimes, they can be life-and-death decisions, and the industry needs proof of "it works" and not proof of
3. concept before adopting it.
4. Tech companies need domain expertise and insights, which leads to a lack of synergy between technology companies and the clinical problem they are trying to solve.
5. EHR (Electronic Health Records) implementation, which was seen as the first step to transform digitally, is seen as a misstep with growing dissatisfaction among clinicians and patients, for example, National Health Services in the UK (Abbas et al., 2023).

Discussion of Relevant Author—Involved Case Studies

Case 1: Digitization of Patient Experience at a Leading Health Authority

The firm in consideration is a public sector organization that oversees the health system of the UAE. It started operations in 2007 under the direction of the ruler. The program began in March 2008. Leading health authority initiated a mission to digitally transform its services to improve healthcare services to the citizens. The firm wanted to embrace creative innovations to create compelling experiences delivered through an orchestrated ecosystem. With health becoming centerstage and tightening regulations, it wanted to curtail practices that needed to be aligned with the mission of providing high-quality services and were not in line with regulations. Further, it also wanted to ensure that as part strategy for 2015–2021, a 360° approach was needed across all areas of healthcare with the capacity to provide meaningful and positive transformation of health service delivery.

The leading health authority engaged a technology major as part of the digital transformation initiative. The digital transformation team used design thinking methodology in their digital transformation process. Design Thinking leverages a model of an "uninterrupted and steady loop of activity." Teams observed the end customers doing the work, reflected upon the observations, analysed the insights, and synthesized what they had observed to develop a rapid prototype of a better experience. A collaborative team effort which iterated through this loop, observing, reflecting, and making a final product. This collaborative-feedback-based-iterative approach helped the teams to be agile—grasp it quickly and apply it for quick wins.

Cross-disciplinary and multi-functional teams engaged through actions, such as *empathy maps* and *storyboarding*, could better appreciate their user and visualize the outlook. The artifacts created during this exercise formed the story

and enabled teams to share ideas with the customers quickly; users' and stakeholders' ideation ensured enough opportunity was given to the participants to come up with absurd and brilliant ideas. In the initial stages of ideating, it was boring, at times average or even absurd; as it continued, a brilliant idea was generated; the team which was working together in the design thinking voted on both ease of feasibility and impact; an idea which was both feasible and impactful was carried forward and executed. During the process, the focus was not on perfection but on jumping in and continuing iterating, which is evident from the comments shared by the team head of the project:

> While perfection was necessary, the team did not wait for "the perfect solution" but assumed that it was impossible to know everything initially; we were just aware of some things that were good enough to jump in. The earlier one starts "making" rather than "waiting"—the faster he learns. The ideation process to the concept development, and finally, how we delivered, was iterative.

Technology major co-created—engaging with all relevant stakeholders—the right solutions to enable the firm's digital reinvention. At the core of this vision was—an electronic medical record system that brought technologies, capabilities, and processes to the firm's healthcare service network, which operates at different tiers. With the technology major's help and by leveraging design thinking, the firm was able to realize its digital transformation vision as planned (AlSuwaidi & Moonesar, 2021).

Case 2a: Healthcare App for Health Authority Built on Design Thinking

Technology major also designed two award-winning healthcare apps for the citizens. These applications targeted the needs of diabetic patients and those who care for them, and the needs of pregnant women and their family members.

Approximately one in five Dubai residents and citizens have type-2 diabetes. However, access to information on how to manage type-2 diabetes is poor. Furthermore, those who have diabetes—especially type-2—are reluctant to seek help, increasing their risk. To ease the pains of diabetes patients, the health authority engaged a technology major to design a digital platform personalized support system for diabetic patients and their caregivers—to help diabetes patients lead healthy lifestyles. Using design thinking, the mobile app targets the diabetic community, including type-1 diabetic children, elderly type-2 diabetics, caretakers, and family members. The app provides relevant tools and personalized content to help users manage their condition more confidently and gently. Multi-user engagement allows family and caretakers to monitor and support tracking their health. Relevant localized content helped to educate about diabetic topics. Describing the approach of the digital design team, one of the members mentioned:

> We focused on critical issues based on our interactions with the users and their caregivers. What problems were they facing and challenges they were encountering in keeping diabetes in control; what would make them feel successful in winning over the disease; and what they saw as potential hindrances in achieving the same were kept centre stage in designing the app—voted as one of the best apps in the region.

In Design Thinking, team composition and the process of team formation are vital to achieving superior outcomes; diversity and empowerment are essential factors to consider during the team formation stage. These teams usually possess varied experiences, the level of skills and expertise they carry, and diverse backgrounds and races where they come from genders and ages. Further, teams are well-equipped with the skills and empowered to deliver outcomes. By moving operational decisions to the users, teams can develop rapid prototypes as they go through the loop.

During the entire "built stage" of the application, iteration and evolution of user outcomes—through multidisciplinary teams—was the key. Significant time was spent empathizing with the end users' values and beliefs, their life experiences and sources of pain and joy. The design team's focus was to redesign the experience of diabetes patients and their caregivers, an end-to-end solution—from diet management to diabetes control. Each stage's user reviews—and inputs—were vital during the design process. Visualization techniques like storyboarding, scenario mapping, empathy mapping, personification, and accelerated visioning exercises were used to capture and utilize end users' vision to arrive at the most user-friendly application.

Case 2b: Healthcare App—Your Partner in Parenthood

Every 3.5 hours, a baby is born in Dubai. The city's population is expected to grow by 50% by 2020. The growing number of pregnant women lacking access to relevant knowledge on how to manage the pregnancy period increased the frequency of their visits to the doctors. As a part of the citizen's mobile app program to digitize the health service, the health authority engaged a technology major in designing a digital solution to address this pain point of pregnant women and their family members.

A series of steps, the Keys, were applied to scale and utilize Design Thinking across remotely distributed teams. *Hills*, *users*(sponsors), and *playbacks* ensured that teams were aligned around a common purpose and maintained such alignment during the engagement. Hills are purposeful statements written to define user outcomes. Playbacks ensure stakeholders are in the loop—continuously having feedback from them—in a safe space to relate to the user-focused stories and their needs.

Parenthood is a critical milestone in an individual's life. End users of the app were deeply involved in the entire process. The team focused on what else had been done previously, ensuring the incorporation of best practices and past learnings in the conception stage. Stakeholder feedback on ideas—what works for them—was a vital feature of the digital design process. Mentioning the design process, one of the digital design team members mentioned,

> Reflection ensures that there is a convergence of points of view, ensuring the right decision-making based on a good understanding of situations and what difference, in the end, it is making for users.

The healthcare applications, commissioned by health authority and powered by Design Thinking, allowed the firm to deliver toward fulfilling its mission partially—"to provide an accessible, effective, and integrated healthcare system that protects public health and improves citizens' quality of life" leveraging design

thinking as it helped developing better products and services both for clinicians and patients alike. The apps were appreciated across multiple platforms for innovation in government services. The success provides evidence that using design thinking makes digital transformation possible.

Findings

The cases discussed above have one typical pattern—design thinking facilitated success in a digital transformation initiative in HDOs, digitization in healthcare works! Based on the analysis of the cases, we prepared four key insights and a *5-point checklist* on how design thinking helps HDOs embrace digital disruption and successfully transform themselves digitally (Figure 2).

While the propositions below hold good across industries, they are highly relevant for healthcare firms looking to embrace digital technology to provide better products and services for better healthcare delivery.

The findings reveal that digitization leveraging design thinking must go beyond the obvious and actively engage participants throughout the journey. It underscores the importance of cross-functional teams collaborating from the early stages of the design process. Additionally, the study highlights the value of recognizing all ideas, even those that may initially seem unconventional. Finally, involving end users early on can lead to benefits and outcomes emerging sooner than anticipated.

Insights

We found in the discussed cases that design thinking ensures participation across the value chain from the suppliers to the end customers, who would be the users. Participation ensures that the needs of all stakeholders are addressed. In successful cases of digital transformation in HDO-patient, clinician, and hospital/healthcare provider engagement through design thinking led to the building of superior products and services.

> Insight 1: The digitization design and implementation team should be able to look beyond the obvious and engage participants across the value chain during the design phase to enhance the success potential of digitization in healthcare delivery organizations.

- ✓ Look beyond the obvious and engage participants across the value chain.
- ✓ Engage cross functioning teams through collaborative activities.
- ✓ Treasure ALL ideas, some of the absurd sounding ones may hold the key to the solution.
- ✓ Decide faster, by letting end users rapidly prototype for the product.
- ✓ Statement of Intent, Sponsor Users, and Playbacks ensure teams remain focused and maintain alignment across complex projects.

Figure 2. 5-Point Checklist on How Design Thinking Helps Embrace Digital Disruption.

Source: Author created a checklist.

Usually, most organizations' leadership styles and siloed structures limit cross-functional cooperation and impede rapid decision-making (Moser et al., 2021). Design Thinking brings together all functions and ensures requirements across the functions are met; this is of significant help as cross-functional conflicts can derail the digital transformation process.

> Insight 2: The digitization design and implementation team should involve cross-functional teams through a collaborative design process from an early phase to enhance digitization's success potential in healthcare delivery organizations.

Design Thinking ensures all ideas are treasured, even though they may sound weird at the start; some ideas that may sound absurd initially have the potential to be truly revolutionary and can be the panacea for the identified pain areas.

> Insight 3: The digitization design and implementation team should value all ideas generated through collaborative thinking, including absurd ideas, during the planning process to enhance the success potential of digitization in healthcare delivery organizations. The "absurd" ideas found may finally lead to the solution.

Designers can quickly decide what product users need by involving end users. Through design thinking, one can rapidly prototype and iterate, leading to quicker turnarounds and faster product rollout.

> Insight 4: The digitization design and implementation team can crash their project time by involving the end users in the prototyping phase to enhance the success potential of digitization in healthcare delivery organizations.

Design thinking ensures that solution-planning teams are aligned and focused on the purpose throughout the digital transformation initiative. Through the statement of intent and playbacks, stakeholders are aligned throughout the process, ensuring success during the implementation phase.

Managerial Implications

This document offers significant perspectives on applying design thinking in the digital transformation of healthcare services. The managerial implications derived from the article suggest that managers should ensure that the digitization design and implementation team look beyond the obvious and engage participants across the value chain during the design phase to enhance the success potential of digitization in HDOs. Managers should involve cross-functional teams through a collaborative design process from an early phase of the design process to enhance the success potential of digitization in HDOs. Managers should ensure that the digitization design and implementation team values all ideas generated through collaborative thinking, including absurd ideas, during the planning process to enhance the success potential of digitization in HDOs. Managers can crash their project time by involving the end users in the prototyping phase to enhance the

potential for the success of digitization in HDOs. Further, managers should ensure that the solution-planning teams are aligned and focused on the purpose throughout the digital transformation initiative. Through the statement of intent and playbacks, stakeholders can be aligned throughout the process, ensuring success during the implementation phase.

However, design thinking is not a magic formula that guarantees success in every digital transformation project. Managers should know the challenges and risks of such complex and uncertain endeavors and be ready to adapt and learn from failures. The above implications can serve as valuable guidelines for managers leveraging design thinking to achieve better patient and organizational outcomes.

To successfully implement digital transformation, managers must embrace design thinking as a method and mindset. Design thinking can help managers understand patients' and stakeholders' needs and expectations, generate creative and feasible solutions, and iterate and improve them based on evidence and feedback. The above implications can assist managers in using design thinking strategically and collaboratively to deliver better outcomes for their patients and organizations.

Conclusion

As we saw from the above systematic literature review and discussion around author—cases, digital disruption powered by design thinking has helped teams across cultures and contexts be innovative problem solvers and provide immense value to the users and the organization implementing digitization. By improvising, designers and engineers can improve products and services on the go, resulting in outstanding customer experience over a long time, leading to a significant increase in staff satisfaction and improving the quality of services delivered productively through teams of product managers, designers, technical teams working together (Bender-Salazar, 2023).

This research provides valuable insights into the concept of design thinking and its role in fostering digital transformation. It contributes to the literature by delving deeply into the "how" question, offering pragmatic insights that can significantly enhance outcomes. Additionally, the study presents practical examples and case studies that illustrate the effective application of design thinking in real-world healthcare settings.

Thus, design thinking can facilitate the success of digital transformation across industries. It is pivotal in helping healthcare firms design products and services that meet stakeholder needs across the value chain, leading to successful adoption. If design thinking is scaled up in HDO digital transformation processes, healthcare will catch up with some of the other industries in imbibing digital. This transformation will benefit patients and clinicians and unlock $300–450 bn in value (Kokshagina, 2021).

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Authors' Contributions

All authors contributed to the conceptualization and execution of the research article.

Data Availability

Data sharing does not apply to this article due to privacy and ethical concerns, neither the data of industry experts nor its source can be made available to the public. The references are provided in the manuscript.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Ethical Statement

Ethical permission was not applicable for this article, as this is a review article drafted from various research articles and not from patients directly.

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