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EXPLORATION OF DESIGN THINKING METHODS FOR DIGITAL PLATFORMS

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Abstract

In today's fast-paced digital landscape, digital platforms shape commercial, educational, and social interactions. The increasing competition in digital platform development demands continuous innovation and a user-centred approach. This study explores the integration of the Design Thinking process into digital platform design, examining how each stage of this methodology can be adapted to address key challenges such as multi-stakeholder collaboration and technological complexity. Through multiple case studies of digital platform developers, this qualitative research investigates how Design Thinking fosters innovation and enhances user satisfaction. The study culminates in a practical framework designed to help developers optimize user experience and strengthen their competitive edge in the market. Additionally, the findings contribute to existing literature by refining the application of Design Thinking in digital environments and highlighting avenues for further research in related contexts.

Keywords: Design thinking, Digital platform, Exploration.

1. Introduction

In today's rapidly evolving digital era, digital platforms have become integral to modern society. Whether in commercial, educational, or social sectors, these platforms facilitate more seamless, efficient, personalized interactions between users and service providers. However, as competition intensifies, digital platform developers must continuously innovate and create engaging user-cantered experiences. One increasingly popular approach to achieving this is the Design Thinking method [1-3].

First popularized by Tim Brown of IDEO, Design Thinking is a problem-solving approach that prioritizes user needs. This process consists of several key stages: understanding the problem through user empathy, clearly defining the challenge, brainstorming creative solutions, developing prototypes, and testing the solutions with users. Each step is carefully structured to ensure the outcome is meaningful and effective in addressing user needs [2].

Integrating Design Thinking into digital platform development fosters innovation and enables developers to create more adaptable and responsive solutions to the ever-changing digital landscape. However, despite its significant potential, applying this method presents various challenges. One of the main difficulties lies in translating each stage of the Design Thinking process into the complex context of digital platform development, which often involves multiple stakeholders. This challenge is particularly relevant given the extensive interactions that digital platforms facilitate, spanning end users, developers, and third-party service providers [2, 3].

This study focuses on applying the Design Thinking model in digital platform development. It aims to explore how each stage of the Design Thinking process can be adapted and integrated into the digital platform development cycle while identifying potential challenges in its implementation. Additionally, this research provides valuable insights for digital platform designers leveraging Design Thinking to create more competitive and engaging platforms [3].

This study contributes to the growing body of knowledge on the application of Design Thinking in digital platform development and offers practical guidance for professionals in the field. Ultimately, beyond assessing the effectiveness of Design Thinking in this context, the study aims to pave the way for further research exploring its potential across various digital domains.

2. Research Method

2.1. Design thinking

Design Thinking is an innovative problem-solving approach that prioritizes a deep understanding of end-user needs. It is a human-centred, iterative process designed to develop practical and feasible solutions for enhancing user experiences [1]. As shown in Fig. 1, Design Thinking process consists of five key stages: Empathize, Define, Ideate, Prototype, and Test, each playing a crucial role in the creative process.

The Empathize stage focuses on understanding users' perspectives through direct observation and interaction. Defining involves clearly articulating the problem based on insights gathered from the empathy stage. Ideate encourages the generation of creative ideas without limitations, while Prototype involves building

an initial model of the proposed solution. Finally, the Test stage evaluates the Prototype with users to gather constructive feedback and refine the solution accordingly [2].

Fig. 1. Design thinking process.

2.2. Digital platforms and their challenges

Design Thinking has emerged as a strategic approach for developing user-cantered products and services in digital environments. Previous research incorporated Design Thinking into software development can enhance customer satisfaction and creativity [3]. Given digital platforms' complexity and dynamic nature, an adaptive and responsive approach is essential to meet evolving user needs. By placing people at the centre of the design process, Design Thinking provides a flexible framework for tackling these challenges - offering agility, resourcefulness, and adaptability in unpredictable situations. Several studies have demonstrated the successful application of Design Thinking in digital platform development. For instance, technology companies like IBM and Google have integrated Design Thinking principles into their product development workflows, leading to more innovative and market-driven solutions. A case study on mobile application development found that applying Design Thinking can accelerate development cycles and improve final product quality through continuous iteration [4].

2.3. Digital technology in design thinking

The integration of digital technology into the Design Thinking process has been a growing area of research in recent years. Previous research highlighted that the advancements in AI, machine learning, and data analytics have significantly transformed how ideas are generated and tested [5]. These technologies enable faster iteration, allowing design teams to evaluate multiple prototypes within shorter timeframes. Rapid prototyping, in particular, plays a crucial role in the digital platform design cycle. Tools such as Figma, Sketch, and InVision empower designers to create functional prototypes and gather immediate user feedback, which aligns with the findings of a previous research, who emphasized that rapid iteration and continuous feedback are essential for ensuring design relevance in response to changing user needs [6].

2.4. Design thinking model

Different institutions and practitioners have developed Various Design Thinking models. One of the most well-known is the Stanford d.school model, which consists of five stages: Empathize, Define, Ideate, Prototype, and Test. This model emphasizes iteration and flexibility, allowing teams to revisit previous stages based on user feedback.

Additionally, IBM Design Thinking offers a more structured approach, focusing on multidisciplinary collaboration, technology integration, and clear success metrics. Before moving into ideation, this model introduces additional stages, such as Understand and Explore, highlighting the importance of cross-functional teamwork in developing more comprehensive solutions.

This study adopts the Stanford d.school model as its foundation, with specific adjustments tailored to the context of digital platform development. These modifications ensure that each stage can be effectively applied in environments that involve multiple stakeholders and complex technologies.

2.5. Gap research

Although numerous studies have examined the application of Design Thinking in digital platform development, a significant research gap remains regarding its practical implementation in this context. Despite the increasing body of research on Design Thinking, many studies do not directly explore its application in digital environments, which often involve more complex interactions and dynamic technologies. Most existing research focuses on the use of Design Thinking in designing traditional physical products or services [7].

Moreover, previous studies tend to emphasize the outcomes of Design Thinking rather than exploring how each stage of the process can be adapted and optimized for digital platforms. This highlights the need for further investigation into how key steps - such as prototyping and testing—can be integrated with agile methodologies and continuous deployment strategies commonly used in modern digital platform development.

This study addresses this gap by providing an in-depth analysis of how Design Thinking can be effectively applied to digital platform development. The primary focus is on adapting each stage of the process to manage digital platforms' complexity and dynamic nature while identifying the challenges and opportunities that arise throughout the development cycle.

3. Research Method

The primary objective of this qualitative study is to examine how the Design Thinking approach is applied in digital platform development. A qualitative approach was chosen because it captures the nuanced and dynamic aspects of the design process that cannot be quantified, providing a deeper understanding of its complexity from practitioners' perspectives [8] (see Fig. 2). This study adopts multiple case study design, selecting several digital platforms as research subjects for comprehensive analysis. The case study approach enables an in-depth exploration of how each stage of Design Thinking is implemented in different contexts while identifying patterns and variations in its application [9]. Using multiple case studies also facilitates comparisons of Design Thinking practices across diverse digital platform development environments.

The study population includes product managers, UX/UI designers, digital platform developers, and other key stakeholders involved in the development process. Participants were purposefully selected based on their direct involvement in applying Design Thinking throughout the digital platform development cycle. Three different digital platforms were chosen as case studies to ensure diversity in

development contexts, industry sectors, and organizational sizes. This selection provides broader and more comprehensive insights into how Design Thinking is utilized across various scenarios.

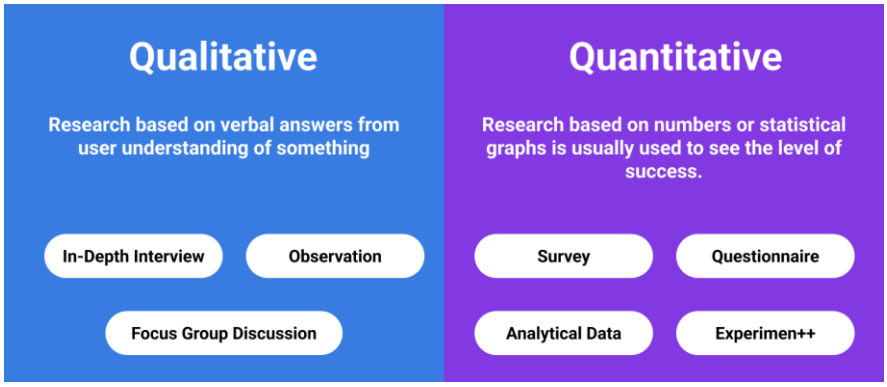

Fig. 2. Research method.

3.1. Data collection

To ensure triangulation and enhance the quality of the findings, the research data were collected using multiple methods:

i) In-depth Interviews: Semi-structured interviews were conducted with each digital platform's engineers, designers, and product managers. These interviews aimed to uncover the challenges encountered during the development process and examine how each stage of Design Thinking was applied.

ii) Participatory Observation: Direct observation of brainstorming sessions, prototyping activities, and product testing at each digital platform. These observations provided insights into team dynamics and the practical implementation of Design Thinking methods.

iii) Focus Group Discussion (FGD): FGDs were held with end-user groups to gather feedback on their experiences with digital platforms developed using Design Thinking. This approach helped assess the effectiveness in enhancing user experience.

3.2. Data analysis

A thematic analysis method was used to examine the collected data. The analysis process involved the following steps:

i) Transcription and Initial Coding: All interviews and observations were fully transcribed. Initial coding was performed to identify key themes emerging from the data.

ii) Theme Identification: Related codes were grouped into broader categories, reflecting not only the phases of Design Thinking (Empathize, Define, Ideate, Prototype, Test) but also the challenges encountered, and successes achieved during implementation.

iii) Comparative Analysis: Findings from each digital platform were compared using multiple case studies to identify common patterns and key differences in applying Design Thinking.

iv) Thematic Interpretation: The identified themes were analysed in the context of existing literature to understand how the findings contribute to or reinforce current knowledge on Design Thinking in digital platform development.

3.3. Validity and reliability

To ensure the validity and reliability of the research, the following measures were implemented:

i) Data Triangulation: Findings were cross verified using multiple data collection methods, including observations, interviews, document analysis, and focus group discussions.

ii) Member Checking: Preliminary analysis results were shared with informants to confirm that the established interpretations aligned with their experiences and perspectives.

iii) Reflexivity: Active reflection is conducted on potential biases and personal influences during the research and data analysis process, ensuring objectivity in interpreting findings.

4. Results and Discussion

The analysis reveals that actively involving end users in ideation sessions dramatically enhances the quality and diversity of ideas generated. This finding highlights the critical role of multidisciplinary collaboration in the design process. Building on this exploration of Design Thinking [10], this study proposes a framework to guide digital platform developers in effectively utilizing the Design Thinking methodology. The following framework outlines key stages and best practices for applying Design Thinking in digital platform development.

4.1. Empathize

The Empathize stage involves conducting observations and interviews and distributing questionnaires to potential users to gain insights into the research focus. Observations were conducted in various public environments and social media platforms, while interviews were conducted with relevant stakeholders. These steps were taken to understand user behaviour, needs, and motivations in specific conditions and contexts. User research is typically conducted through methods such as observation, surveys, and interviews. Several approaches can be used to facilitate the Empathize process, ensuring a deeper understanding of user experiences [11].

4.2. Define

This process aims to identify potential challenges faced by prospective app users. The research defines this process in two key stages: Pain Point Identification by mapping out existing user problems and Opportunity Framing by exploring potential solutions to address these challenges effectively.

4.2.1. Pain point

A pain point refers to any specific problem that users may encounter in various ways. Pain points encompass all users' difficulties when interacting with a product or system [12, 13]. Addressing these issues aims to reduce application complexity, enhance user satisfaction, and improve overall business process efficiency. Sample of pain points are shown in Fig. 3.

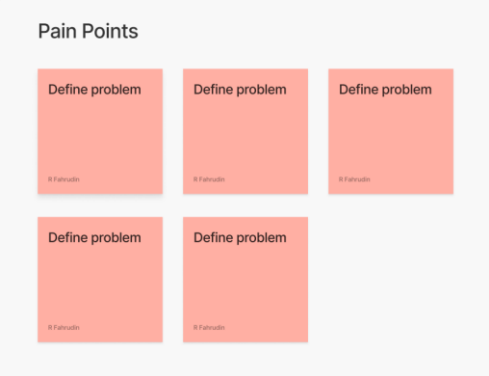

Fig. 3. Pain points sample.

4.2.2. How-might we

Building on identified user pain points, the focus shifts to the How Might We (HMW) approach - a brainstorming technique that transforms problem statements into opportunities for innovation. How Might We questions emerge from problem statements or design principles, serving as the foundation for idea generation. At this stage, designers must adopt the user's perspective, allowing them to empathize with the challenges and uncover potential solutions [14-16]. Sample of HMW approach is shown in Fig. 4.

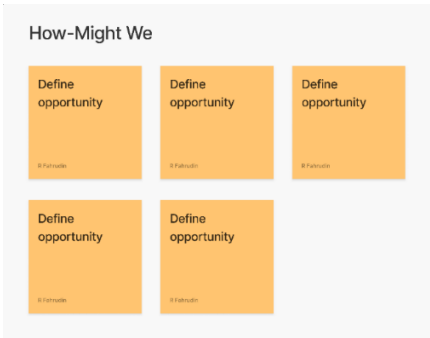

Fig. 4. How might we sample.

4.3. Ideate

With problem areas clearly defined, the ideation process begins. This involves Solution Concept Generation, Affinity Diagram Generation, Information Architecture Generation, User Flow Generation, and Crazy 8's Technique.

4.3.1. Solution idea

The How Might We (HMW) approach from the previous step serves as a foundation for generating solutions to the identified problems. This process ensures that the ideas developed directly address the current challenges. Multiple solution proposals are generated at this stage, and a voting process is conducted to determine the most promising idea. Researchers and stakeholders evaluate the proposed solutions collaboratively, selecting the one that best aligns with user needs and project objectives. Sample of Solution Idea is shown in Fig. 5.

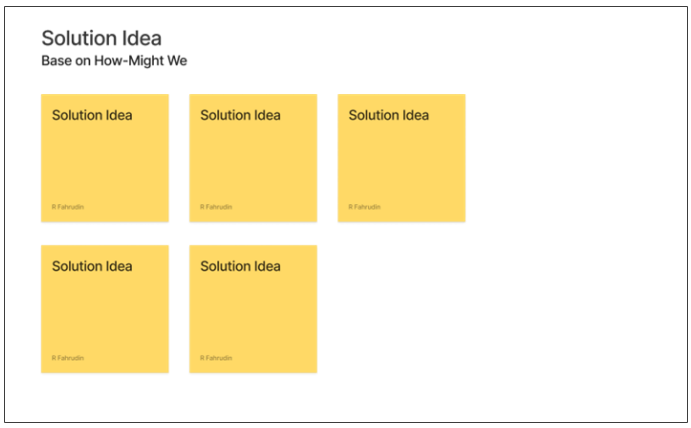

Fig. 5. Solution idea sample.

Once the most viable solution is chosen, the next step is to design the features to be integrated into the application. This design process focuses on creating functionalities that effectively address user pain points while enhancing overall user experience.

4.3.2. Affinity diagram

The principles outlined in this procedure are synthesized to form a structured approach. Developing affinity diagrams is crucial in selecting and organizing key insights derived from user research [17-19]. Sample of Affinity diagram is shown in Fig. 6.

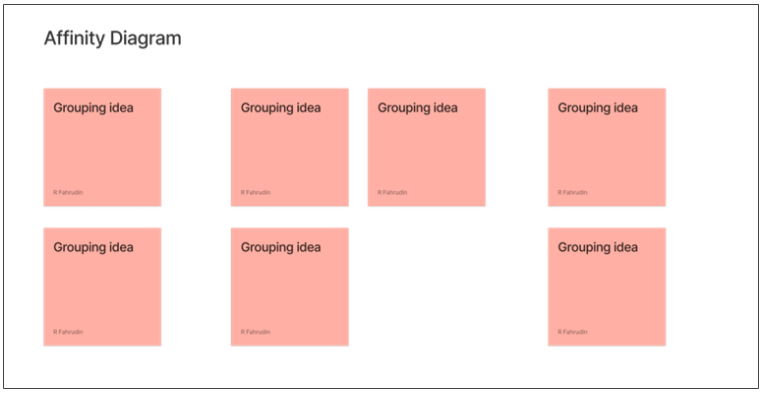

Fig. 6. Affinity diagram sample.

4.3.3. Prioritization idea

Ideas are prioritized based on their potential user value and the effort required for implementation. As shown in Fig. 7, The prioritization framework follows four categories: Yes, do it now; Yes, do it next; Yes, do it later; and Yes, do it last [20].

Fig. 7. Prioritization idea.

4.3.4. User flow

Additionally, a user flow diagram visualizes the sequence of activities a user must complete to achieve a specific goal. This flow is informed by the company's business processes and insights gained from analysing user behaviour, mainly how they interact with the application. A sample user flow diagram is shown in Fig. 8.

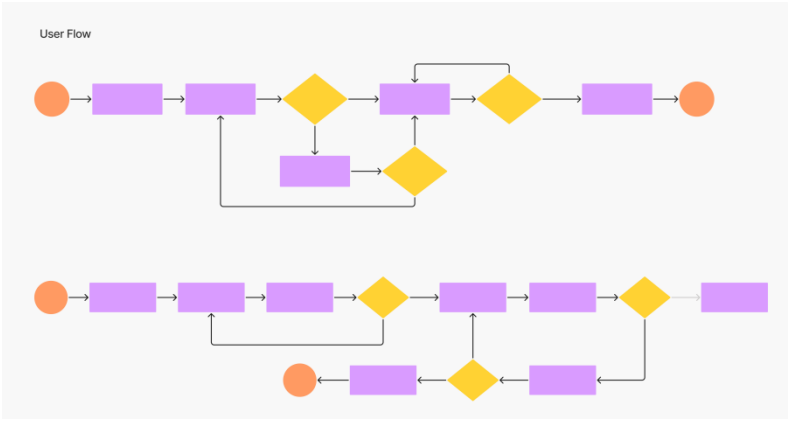

Fig. 8. User flow sample.

4.3.4. Information architecture

Information architecture refers to the structured presentation of information through interlinked charts, columns, or other formats that facilitate understanding. It is also a framework for designing labelling systems, organizing content, and structuring search and navigation functionalities within a website or software application. A sample of information architecture is shown in Fig. 9.

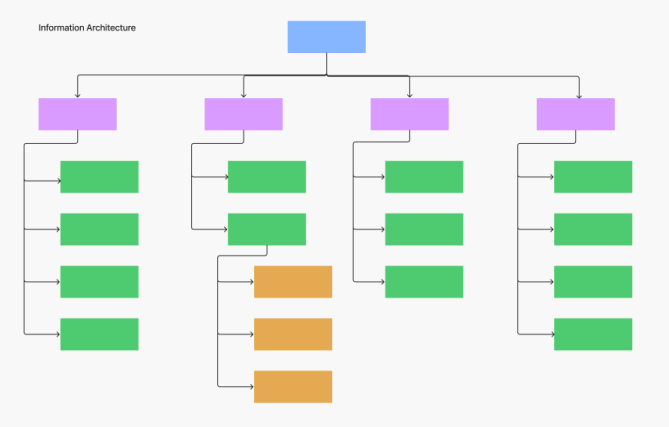

Fig. 9. Information architecture sample.

4.3.5. Crazy 8's

The Crazy 8's drawing challenge is a rapid ideation exercise designed to generate eight unique ideas in just eight minutes. This technique encourages creativity by surfacing latent ideas and exploring diverse solutions quickly. A sample of Crazy 8's drawing is shown in Fig. 10.

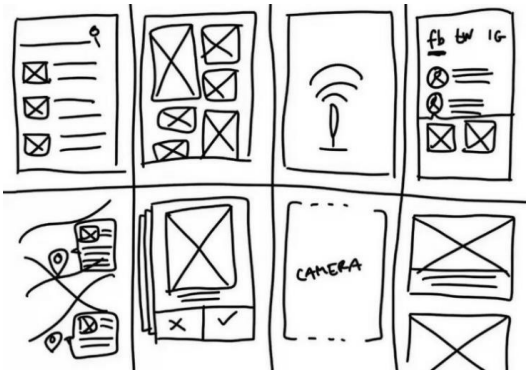

Fig. 10. Crazy 8's sample.

4.4. Prototyping

A prototype serves as a system design blueprint, providing a scalable model that can be adapted for future iterations. The primary objective of prototyping is to develop a product that aligns with consumer or market demands. The process involves several key steps, including wireframing and the creation of a UI Style Guide to ensure a structured and visually consistent design.

4.4.1. Wireframing

A wireframe is a structural layout that defines the basic framework of an application page or website. It serves as a visual guide, outlining the organization of content, navigation, and functionality within the interface, as shown in Fig. 11.

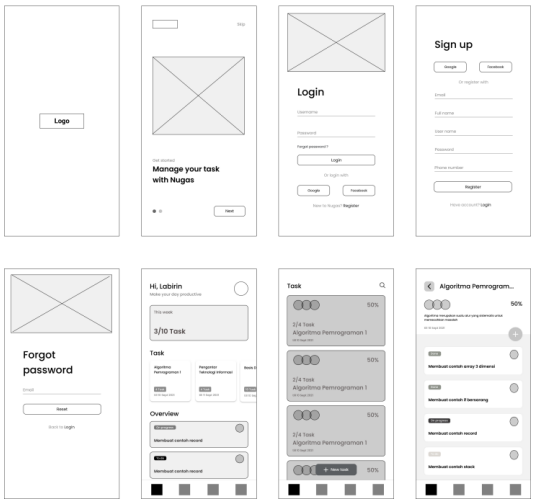

Fig. 11. Wireframe sample.

4.4.2. UI style guide

A UI Style Guide is a document that establishes design standards, principles, and guidelines to ensure consistency and cohesion across a digital product or platform. It includes specifications for typography, colour schemes, icons, spacing, and other visual elements used by the design and development teams. Figure 12 shows the sample of a UI Style Guide.

Fig. 12. UI Style guide sample.

4.4.3. Prototyping

A prototype is a system design approach that establishes a foundational size and scale for future iterations. Its primary goal is to develop a product aligned with consumer or market demands. A sample prototype is shown in Fig. 13.

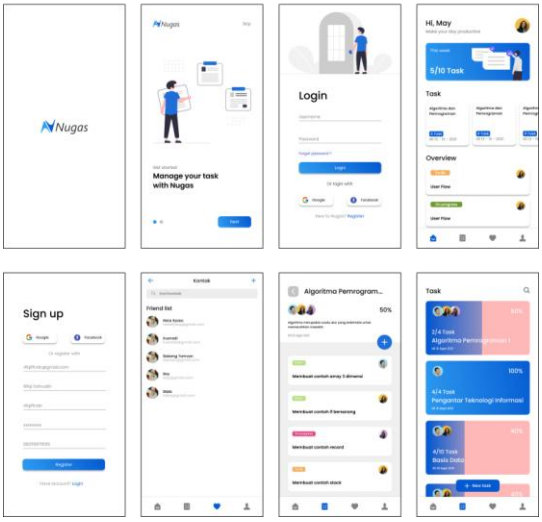

Fig. 13. Prototyping sample.

4.5. Testing

Design Testing evaluates a fully developed design to ensure it functions correctly and meets specified requirements. Additionally, design testing helps identify errors and deficiencies in the existing design. Various testing methods can be employed to assess digital platforms. Usability Metrics serve as key indicators for measuring a design's usability across multiple aspects, such as effectiveness, efficiency, ease of use, and user satisfaction. These metrics help determine the success of a design solution. Below are some commonly used Usability Metrics in digital platform development:

4.5.1. System usability scale (SUS)

SUS is a widely used method that provides a quick and reliable assessment of a system's usability. It consists of 10 standardized questions rated on a Likert scale (1–5). This metric evaluates user satisfaction, ease of use, and effectiveness comprehensively. Figure 14 shows a sample of a system usability scale.

	The System Usability Scale Standard Version	Strongly Disagree				Strongly Agree
		1	2	3	4	5
1	I think that I would like to use this system frequently.	O	O	O	O	O
2	I found the system unnecessarily complex.	O	O	O	O	O
3	I thought the system was easy to use.	O	O	O	O	O
4	I think that I would need the support of a technical person to be able to use this system.	O	O	O	O	O
5	I found the various functions in this system were well integrated.	O	O	O	O	O
6	I thought there was too much inconsistency in this system.	O	O	O	O	O
7	I would imagine that most people would learn to use this system very quickly.	O	O	O	O	O
8	I found the system very awkward to use.	O	O	O	O	O
9	I felt very confident using the system.	O	O	O	O	O
10	I needed to learn a lot of things before I could get going with this system.	O	O	O	O	O

Fig. 14. SUS sample.

4.5.2. Single ease question

The SEQ method measures how easily users find a task after completing it. Users rate the difficulty on a 1–7 scale, focusing solely on ease of use. A benchmark score of 5.5 is typically used as a success threshold. Figure 15 shows a SEQ sample

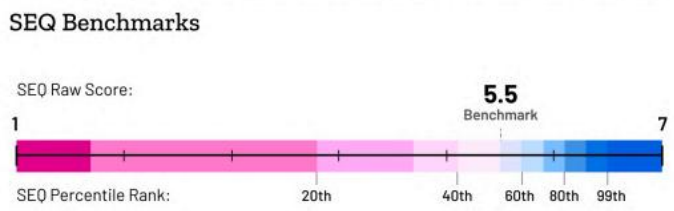

Fig. 15. SEQ sample.

5. Managerial Implications

The study's findings have significant managerial implications for digital platform development, particularly when implementing a modified Design Thinking approach. The findings namely:

i) Enhancing Cross-Disciplinary Collaboration. The application of the modified Design Thinking method underscores the importance of collaboration across various organizational functions, especially during the Ideate stage. Management should foster closer integration between design, development, marketing, and product management teams to generate innovative ideas that align with user needs,

ii) Leveraging User Data in Decision-Making. One key finding highlights the importance of user data in the ideation process. Management must ensure that decision-making is data-driven rather than purely based on intuition. This requires investment in advanced analytics tools and training teams to effectively utilize data, leading to more targeted and impactful ideas; and

iii) Prioritizing User-Centred Development. The exploration of the Design Thinking method reinforces the need for a deep understanding of user needs and challenges. Management should place users at the core of every product decision by strengthening customer relationships, conducting frequent surveys, interviews, and usability testing, and continuously refining digital platform features based on feedback.

6. Conclusion

By emphasizing modifications to the Ideate stage, this study has effectively explored the application of Design Thinking in digital platform development. The findings demonstrate that, with the right adjustments, Design Thinking can be even more effective in producing user-centred solutions that respond to evolving market demands. Key modifications - such as integrating user data into ideation - enhance teams' ability to generate more precise and innovative ideas.

This study also contributes a practical framework for adapting digital platform teams. This framework is built upon a design-driven approach, A responsive and iterative development process, and the use of digital tools and technologies to

accelerate creativity. Combining these elements, the modified Design Thinking approach offers a more flexible and adaptive model, enabling teams to develop competitive, high-impact digital platforms.

Overall, this study reaffirms the relevance of Design Thinking as an influential innovation method. However, further exploration and customization are necessary to maximize its effectiveness to suit specific industry contexts and project requirements. The proposed framework provides digital platform developers with a structured yet adaptable strategy, ensuring they can confidently apply Design Thinking to build products that resonate with users and drive market success.

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