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UI/UX Design for New Student Admission Queue System Using the Design Thinking Method

Antonius[1*], Genrawan Hoendarto[2], Tony Darmanto[3], Sandi Tendean[4]
[1,2,3,4]Universitas Widya Dharma Pontianak, Indonesia
[1]antonius@widyadharma.ac.id, [2]genrawan@widyadharma.ac.id, [3]tony_d@widyadharma.ac.id,
[4]sandi_t@widyadharma.ac.id

*Corresponding Author

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ABSTRACT

The new student admission process (PMB) often faces queue management issues, as prospective students must wait in line to submit documents, verify data, and consult staff. This study designed a user interface (UI) for a PMB queueing system at Universitas Widya Dharma Pontianak (UWDP) using the Design Thinking approach. The UI was created with Figma as an interactive prototype and later developed into a web-based application. Design Thinking consists of five stages: empathize, define, ideate, prototype, and test to ensure the solution meets user needs. During empathize, interviews and observations were conducted with students and the PMB committee to identify queue-related problems. The findings were turned into user personas and problem statements in the define stage. Next, the ideate stage produced prioritized solution ideas, followed by a user interface prototype in Figma. The resulting prototype visualizes the queueing process from registration to student call-outs, featuring remote queue number retrieval, and the real-time queue display. The prototype was tested using the System Usability Scale (SUS) questionnaire with 30 prospective students. The average SUS score was 78.5, classified as "acceptable" with a grade B (Good). This indicates that the prototype has good acceptance and meets user needs in terms of ease of use and clarity of queue information. This research contributes to the development of digital queueing systems in higher education and enriches the literature on applying Design Thinking to new student admissions.

INTRODUCTION

New student admission (Penerimaan Mahasiswa Baru or PMB) is a strategic process that significantly influences the sustainability and quality of a higher education institution. Every year, universities admit many prospective students who must go through various administrative stages, including registration, document verification, and the announcement of admission results. In this process, queue management is a critical aspect that requires attention. At many universities, the queuing process for document verification and consultations is still conducted manually, requiring prospective students to arrive early, queue physically, and wait for an indefinite period. These conditions lead to issues including unpredictable wait times, crowding in registration areas, and the potential for data recording errors due to unstructured manual processes (Maala & Sebua, 2023) (Mallari et al., 2023).

Digital queuing systems have been shown to improve public service efficiency by reducing wait times and providing transparent information. However, the implementation of digital queuing systems in educational settings, particularly in the student admission process, remains relatively limited. Most web-based student admission systems developed to date focus primarily on online registration and the management of prospective student data, but do not specifically address queuing management for physical document verification and in-person consultations. Yet, these verification and consultation activities still require direct interaction between prospective students and the admission committee, making a structured queuing system a necessity that cannot be overlooked.

Several UI/UX studies employing the Design Thinking method have revealed a consistent pattern. The five stages : empathize, define, ideate, prototype, and test consistently produce interfaces with high usability scores. These five stages have been successfully applied in numerous studies to understand user needs, define core problems, generate solution ideas, create prototypes, and iteratively refine designs (Ratna Nur Fadilah & Dhian Sweetania, 2023). The emphasis on empathy and iterative testing renders the resulting design more user-centered, intuitive, and easy to learn (Izzuddin & Suzianti, 2025).

A previous study applied Design Thinking to design a mobile-based student admission system at Universitas Muhammadiyah Magelang, achieving a usability score of 86 (Narizki et al., 2023). Another study redesigned a student admission website at Trilogi University using Design Thinking, obtaining an SUS score of 73.1, which falls into the "good" category but still indicates for improvement (Billy et al., 2025). However, these studies primarily focus on general admission systems rather than queuing systems for physical document verification and in-person consultations.

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Furthermore, no previous research has specifically addressed the design of a web-based queuing system for new student admissions at private universities in West Kalimantan. To address this gap, the present study aims to design a user interface for a PMB queuing system at UWDP using the five-stage Design Thinking method, with usability evaluated through System Usability Scale (SUS).

Research on queuing systems in academic settings has demonstrated the value of digitalization. At Manuel S. Enverga University Foundation, digital queuing allowed students to join virtual queues, reducing physical waiting time and increasing satisfaction (Maala & Sebua, 2023). Similarly, online queuing systems enable users to obtain queue numbers remotely, minimizing wait times and reducing crowding (Husania et al., 2025). Despite these contributions, several research gaps persist. First, prior studies focus on general registration systems, not specifically on queuing for in-person verification and consultation. Second, no research has addressed the PMB queuing process at private universities where prospective students have diverse digital literacy levels. Third, no study has fully integrated the Design Thinking approach into a web-based queuing system that combines remote queuing, real-time displays, and automatic notifications. Consequently, there remains a need for research that connects physical queue management requirements with responsive, user-friendly digital interface designs for prospective students.

Although these studies have made significant contributions, several research gaps remain that this study aims to address. First, previous studies have focused primarily on general registration systems rather than on queuing systems for in-person verification and consultation activities within the PMB process. Second, no study has specifically targeted the PMB queuing process at private universities where prospective students have varying levels of digital literacy. Third, no study has fully integrated the Design Thinking approach which ensures user-centered design into a web-based queuing system that includes remote queuing, a real time queue displays, and automatic notification. There is still limited research that connects the practical needs of physical queue management with responsive, user-friendly digital interface design for prospective students.

LITERATURE REVIEW

The User Interface (UI) refers to the visual appearance and interactive elements of an application that allow users to interact with the system. Good UI design must consider aesthetic aspects, consistency, and ease of navigation so that users can use the application efficiently. Design involves balancing various requirements related to the environment, users, data, usability, and user experience with functional requirements (Roger et al., 2023). Meanwhile, User Experience (UX) encompasses all aspects of user interaction with the system, including the feelings, perceptions, and emotional responses that arise during use. In the context of the PMB queueing system, a well-designed UI can help prospective students understand the registration process, track their position in the queue, and obtain clear information without confusion. Peter Morville, through the UX Honeycomb model, identifies seven key aspects of user experience design: useful, usable, findable, credible, desirable, accessible, and valuable. This model is often used as an evaluation framework to ensure that a design not only meets functional requirements but also provides added value to users. This study uses this model as a reference in formulating evaluation indicators (Sauri et al., 2023).

Design Thinking is a human-centered problem-solving approach that emphasizes empathy, collaboration, and experimentation to generate innovative solutions. The designer's workflow can help us systematically extract, teach, learn, and apply human-centered techniques to solve problems in creative and innovative ways in design, business, and even in life (Yulius et al., 2022). This method was popularized by the Hasso Plattner Institute of Design at Stanford University and consists of five main stages: empathize, define, ideate, prototype, and test (Darmawan et al., 2022). Here is an explanation of each stage :

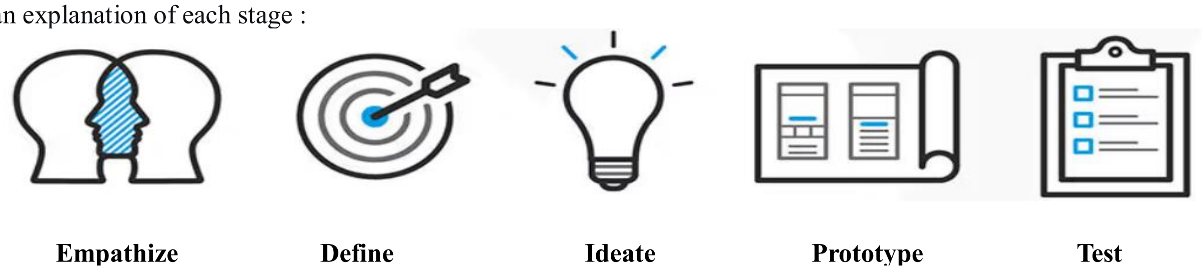

Figure 1. Stages of Design Thinking (Dam, 2025)

Empathize, the initial stage in which designers strive to understand users' needs, experiences, and motivations through various methods such as interviews, observations, surveys, or focus groups. The goal of this stage is to develop a deep understanding of the user's perspective.
Define, the synthesis phase where the results of the empathy phase are analyzed to formulate a clear and focused problem statement. In this phase, researchers create user personas, journey maps, and Point of View (POV) statements that represent the users' core needs.
Ideate (generate ideas), the exploration phase of potential solutions through brainstorming, mind mapping, and other creative methods. The goal is to generate as many ideas as possible without constraints, which are then filtered into the

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most relevant solutions.

Prototype (Creating a Prototype), the selected ideas are realized in the form of tangible representations (prototypes) that can be tested and evaluated. Prototypes can take the form of wireframes, mockups, or interactive prototypes using tools such as Figma.

Test (testing). The final stage where the prototype is tested with actual users to gather feedback. The test results are used to make iterative improvements before final implementation.

The advantages of the Design Thinking method in UI/UX design have been demonstrated by various studies. The main advantages of Design Thinking for UI/UX are:

1. Addressing real user problems (confusing navigation, poor accessibility, monotonous visuals) through the stages of empathize–define–ideate–prototype–test (Wulandari et al., 2025)
2. Producing simpler, more intuitive, and more efficient interfaces, making tasks easy to complete even for new users (Darmawan et al., 2022).
3. Increasing user satisfaction and acceptance, as reflected by high SUS scores and improvements in UEQ scores (attractiveness, efficiency, novelty, and others) on several university websites and online learning platforms (Novianti, 2024).

Several studies have developed digital queuing systems using different approaches. These studies indicate that a user-centered approach is crucial for designing effective queuing systems. (Ningsih et al., 2025) implemented a user-centered design to enhance the user experience in the patient queuing system at Rumah Sakit Al-Irsyad, hospital in Surabaya. Similarly, the implementation of Clique, a web-based queue management system with real-time queue monitoring, was applied at the registration desk of the Angeles University Foundation. This system aims to provide a better web-based queue management system, designed to maximize productivity and deliver excellent service, by reforming traditional processes through the use of technology (Mallari et al., 2023).

Figma is a cloud-based UI design software that enables designers to collaboratively create wireframes, mockups, and interactive prototypes. Figma's strengths include its ease of use, real-time collaboration features, and the ability to produce prototypes that can be tested directly with users without requiring coding. Figma also provides a variety of plugins and component libraries that accelerate the design process. Figma supports the creation of wireframes (mid-fidelity), visual concepts (colors, typography), and interactive prototyping that can be tested directly with users (Putra & Saputri, 2024).

The System Usability Scale (SUS) is a quantitative method developed by John Brooke in 1986 to measure a product's usability. The SUS uses a questionnaire consisting of 10 statements, each with five response options ranging from "Strongly Agree" to "Strongly Disagree". The SUS has been widely used in UI/UX research due to its simplicity and high reliability. The SUS consists of only 10 statements on a 5-point Likert scale and produces a single 0–100 score that is easily understood by designers, managers, and non-technical stakeholders (Novianti, 2024). Meta-analyses and reviews across various domains (education, digital health) indicate that the SUS produces consistent and benchmarkable score distributions (with a global average of approximately 68 as the threshold for "fairly good") (Najaf et al., 2024) (Hyzy et al., 2022).

METHOD

This study employs both qualitative and quantitative approaches, utilizing the Design Thinking method as the primary design framework. The research subjects are prospective new students at UWDP for the 2025/2026 academic year and members of the UWDP New Student Admission Committee (PMB) who are directly involved in the verification and consultation process. Subjects were selected using purposive sampling based on the following criteria: (a) prospective students who have registered and are currently undergoing document verification, and (b) PMB committee members with at least one term of experience in handling the registration process. The research procedure follows the five stages of Design Thinking, as illustrated in Figure 2.

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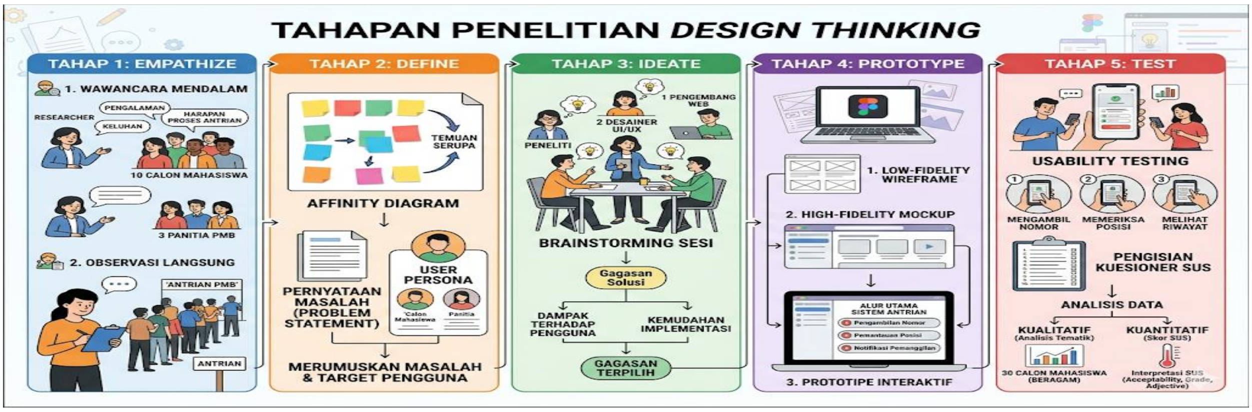

Figure 2. Stages of Design Thinking Research

RESULT

The following is a comprehensive overview of the stages of Design Thinking:

Phase 1 : Empathize

In this phase, the researcher conducted in-depth interviews with 10 prospective students and 3 members of the admissions committee to understand their experiences, complaints, and expectations regarding the queuing process. Direct observations were also made of the queuing process in progress to identify actual problems on the ground.

Phase 2 : Define

The results of the interviews and observations were analyzed using affinity diagram techniques to group similar findings. Next, the researcher formulated a problem statement and created user personas representing the characteristics of the primary users.

Phase 3 : Ideate

The researcher conducted a brainstorming session involving two UI/UX designers and one web developer to generate solution ideas. The ideas generated were then prioritized based on criteria of impact on users and ease of implementation.

Phase 4: Prototype

The selected ideas were realized in the form of low-fidelity wireframes using Figma, followed by the creation of high-fidelity mockups and interactive prototypes. The interactive prototype covered the entire main workflow of the queueing system, from obtaining a queue number and monitoring queue position to call notifications.

Phase 5: Testing

The interactive prototype was tested on 10 prospective freshmen representing a diverse range of backgrounds (gender, region of origin, and experience with technology). The testing was conducted using the usability testing method with the SUS questionnaire. Each respondent was asked to complete three main task scenarios: (1) taking a queue number, (2) checking the current queue position, and (3) viewing the queue history. After completing the scenarios, respondents filled out the SUS questionnaire, which consisted of 10 statements.

The data analysis techniques used were thematic analysis for qualitative data (interview and observation results) and descriptive statistical analysis for quantitative data (SUS results). SUS scores were calculated using a standard formula and then interpreted based on the categories of acceptability, grade scale, and adjective rating.

Based on the results of the needs identification, the primary problem statement was formulated as follows: “Prospective new students at UWDP require a digital queueing system that can be accessed remotely, provides transparency regarding queue position, and sends automatic notifications, as the current physical queueing system causes uncertainty regarding wait times, wastes time, and results in an uncomfortable experience.

Through brainstorming sessions, 10 solution ideas were generated and then narrowed down to 5 top priorities based on criteria such as impact on the user experience and ease of implementation. The five priority solutions are:

1. Remote queuing, prospective students can obtain a queue number via a web application before arriving on campus.
2. Real-time digital queue board, displaying the current queue position, and the number currently being called.
3. Automatic notifications, sending alerts via browser or text message (optional) when a user’s queue number is approaching or it is their turn.
4. Simple admin interface, providing a dashboard for administrators to call queue numbers, skip, or re-call with a single click.

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5. Queue history, storing data on completed queues for evaluation and reporting purposes.

An illustration of the queuing process is shown in the following figure:

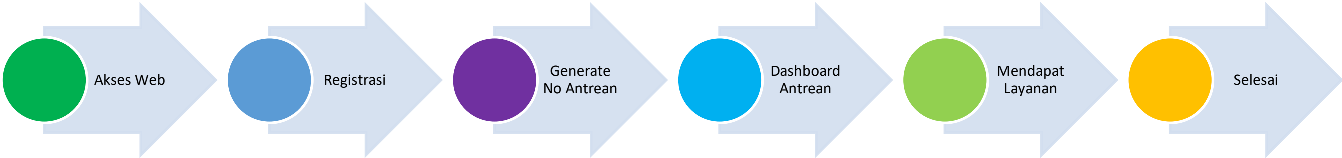

Figure 3. Queuing Process

The following figure illustrates the queue management process handled by the PMB committee:

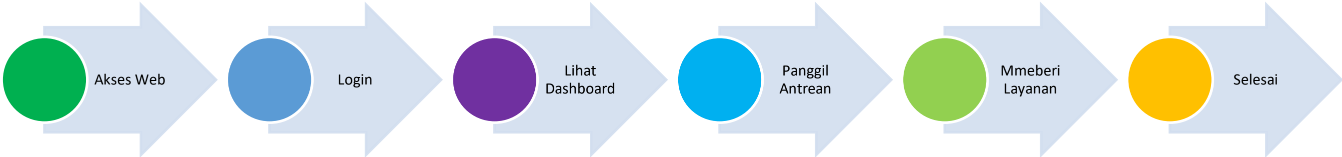

Figure 4. The Queue Management Process

The resulting prototype includes five main pages:

1. Queue Check-in Page, users can access this page to obtain a queue number.
2. Queue Dashboard Page. Displays the user's queue number and current position in the queue (e.g., "Your Queue: No. 1 of 10"). This page serves as the control center for prospective students during the waiting process.
3. Committee Dashboard Page.
4. Displays a list of queue numbers currently waiting, brief information about prospective students (name and school of origin) associated with each queue number, as well as action buttons (Call Queue, Skip Queue, Recall, and Complete).
5. History Page, stores records of completed queues for each user. The Admissions Committee can access a comprehensive report for evaluation.

Here is an overview of the user interface in low-fidelity (Lo-Fi) and high-fidelity (Hi-Fi) formats :

Figure 5. Lo-Fi Get A Queue Number

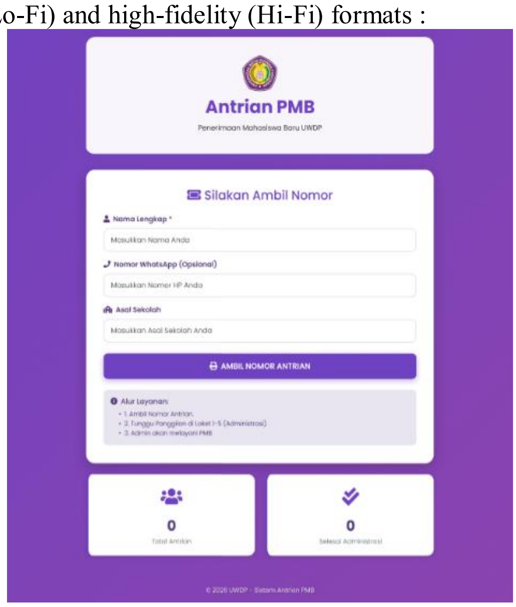

Figure 6. Hi-Fi Get A Queue Number

Figures 5 and Figures 6 show the process of obtaining a queue number by prospective students who wish to request administrative services. Figures 7 and Figures 8 below illustrate the administrative services at each counter for the queueing process requested by the person waiting in line.

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Figure 7. Lo-Fi Queue Service at Counter

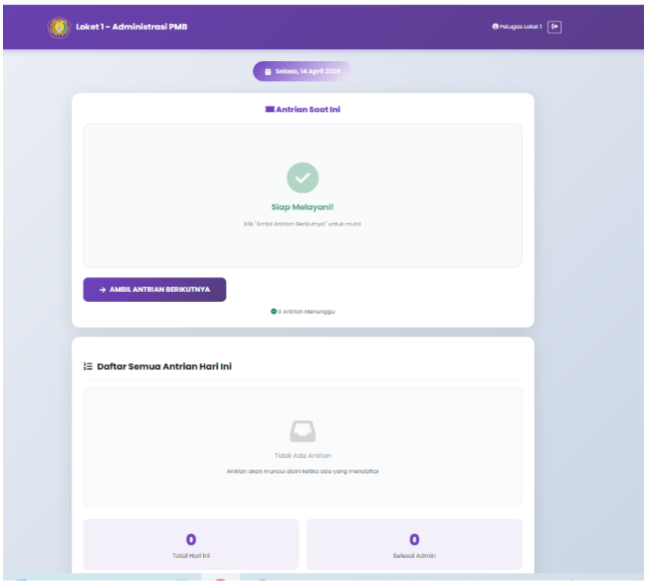

Figure 8. Hi-Fi Queue Service at Counte

Figures 9 and 10 show the dashboard for monitoring the queue

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Figure 9. Lo-Fi Queue Monitoring Dashboard

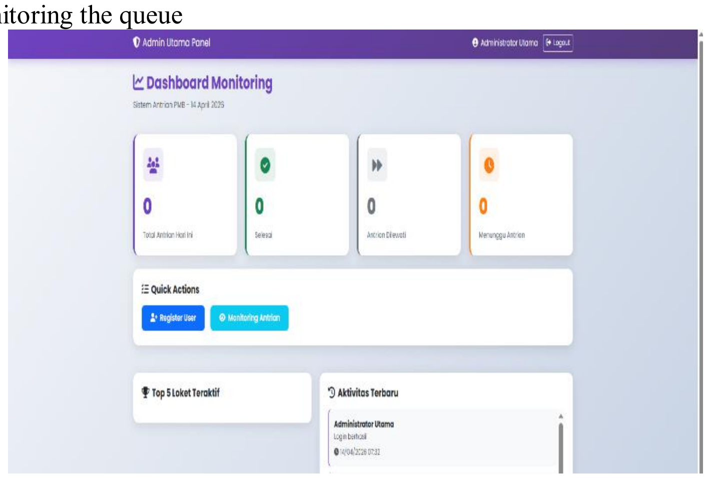

Figure 10. Hi-Fi Queue Monitoring Dashboard

Figure 11. Lo-Fi Queue Monitoring

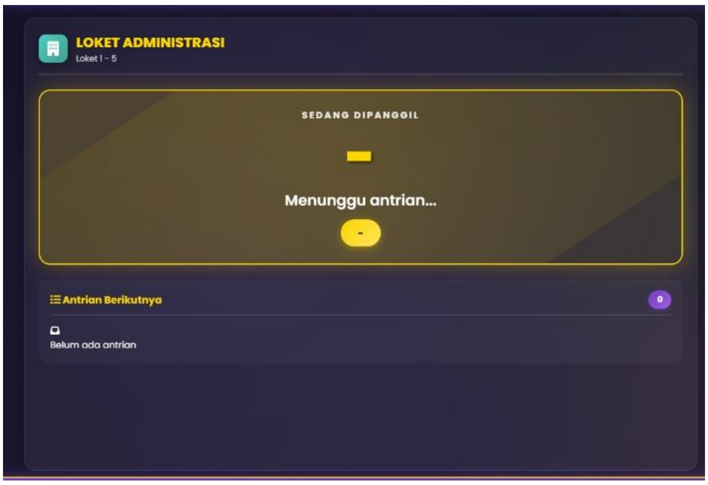

Figure 12. Hi-Fi Queue Monitoring

The researchers tested the completed interactive prototype on 30 prospective students at UWDP. The testing was conducted by presenting three task scenarios as described in the research methodology. After completing all three scenarios, each respondent filled out a SUS questionnaire consisting of 10 statements. The complete questionnaire

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results are presented in Table 1.

Table 1. SUS Questionnaire Average Score Results

No.	Question	Average Score
1.	I will use this system frequently.	4.2
2.	I find this system complicated to use.	1.8
3.	I find this system easy to use.	4.2
4.	I need technical assistance to use this system.	1.8
5.	I feel that the system's feature work as intended	4.1
6.	I feel there are many inconsistencies in this system.	1.9
7.	I feel most people will quickly understand this system.	4.2
8.	I find this system confusing.	1.7
9.	I feel there are no obstacles in using this system.	3.9
10.	I need to learn a lot to use this system.	2.0

Based on the data in Table 1, SUS scores were calculated using the standard formula. For odd-numbered (positive) statements, the score contribution was calculated as (respondent's score minus 1). For even-numbered (negative) statements, the score contribution was calculated as (5 minus the respondent's score). The total contribution from all statements was then multiplied by 2.5 to produce the final SUS score. The calculation showed an average SUS score of 78.5.

Table 2. SUS Score From Respondence

Respondence	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	SUS
R01	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R02	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R03	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R04	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R05	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R06	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R07	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R08	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R09	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R10	3	3	3	3	3	3	3	3	4	2	30,00	75,00
R11	3	3	3	3	3	3	3	3	3	3	30,00	75,00
R12	3	3	3	3	3	3	3	3	3	3	30,00	75,00
R13	3	3	3	3	3	3	3	3	3	3	30,00	75,00
R14	3	3	3	3	3	3	3	3	3	3	30,00	75,00
R15	3	3	3	3	3	3	3	3	3	3	30,00	75,00
R16	3	3	3	3	3	3	3	3	3	3	30,00	75,00
R17	3	3	3	3	3	3	3	3	3	3	30,00	75,00
R18	3	3	3	3	3	3	3	3	2	3	29,00	72,50
R19	3	3	3	3	3	3	3	3	2	3	29,00	72,50
R20	3	3	3	3	3	3	3	3	2	3	29,00	72,50
R21	3	3	3	3	3	3	3	3	2	4	30,00	75,00
R22	3	3	3	3	3	3	3	4	2	4	31,00	77,50
R23	3	3	3	3	3	3	3	4	2	4	31,00	77,50
R24	3	3	3	3	3	3	3	4	2	4	31,00	77,50
R25	4	4	4	4	3	3	4	4	2	4	36,00	90,00
R26	4	4	4	4	3	3	4	4	2	4	36,00	90,00
R27	4	4	4	4	3	3	4	4	2	4	36,00	90,00
R28	4	4	4	4	4	4	4	4	2	4	38,00	95,00
R29	4	4	4	4	4	4	4	4	2	4	38,00	95,00
R30	4	4	4	4	4	4	4	4	2	4	38,00	95,00

$$\text{SUS} = \frac{(8x75)+(3x72.5)+(3x77.5)+(3x90)+(3x95)}{30} = \frac{2355}{30} = \mathbf{78.5}$$

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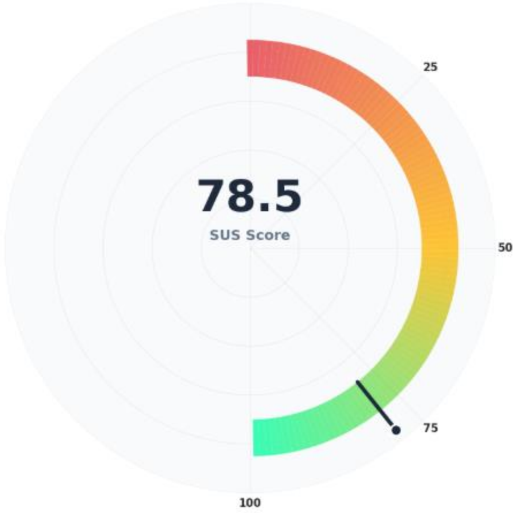

Figure 13. System Usability Score

Table 3 presents the interpretation of SUS scores based on three standard categories.

Table 3. Interpretation of SUS Scores for the UWDP PMB Queuing System Prototype

Acceptability	**Acceptable**	**Meet acceptance standards**
Grade Scale	B (Good)	Design quality is considered good
Adjecticve Rating	Good	Users provided positive feedback

The SUS score of 78.5 is above average (the global SUS average is 68) and falls into the “good” category, with a grade of B and a rating of “good.” This interpretation indicates that the designed PMB queueing system prototype has met the established usability standards and received positive feedback from users.This indicates that the resulting interface design successfully reduced complexity and allowed prospective students to use the system without special training.

DISCUSSION

One key finding of this study is that prospective students highly value the remote queue number retrieval feature and automatic notifications. In initial interviews, more than 80% of respondents complained about the uncertainty of wait times, which forced them to arrive early in the morning and wait for a long time. After trying a prototype that provided real-time information about their position in the queue and estimated wait times, most respondents stated that the system gave them peace of mind and allowed them to manage their time better. This finding confirms that information transparency is a key factor in improving the user experience of digital queuing systems.

From the admissions committee’s perspective, the dashboard designed with simple and clear action buttons received high praise. The committee stated that the proposed system would reduce the risk of miscalls and facilitate tracking of prospective students who have or have not been served. This demonstrates that the Design Thinking approach, which involved both user groups (prospective students and the committee) from the early stages, successfully accommodated their distinct yet interrelated needs. However, this study has several limitations. First, the testing was conducted on a limited scale (30 respondents) and did not include all prospective UWDP students. Second, the testing was conducted using an interactive prototype in Figma, rather than a fully implemented web application. Although the interactive prototype provided a good overview of the system’s workflow and functionality, it is possible that actual usability may differ once the system is fully implemented. Third, this study did not measure technical aspects such as system performance (response time), data security, and scalability.

CONCLUSION

This study successfully designed a user interface for the UWDP student admission queue system by applying the Design Thinking method, which consists of five stages: empathize, define, ideate, prototype, and test. The prototype created using Figma includes five main pages (homepage, prospective student dashboard, committee dashboard, call page, and history) with key features such as remote queue number retrieval, a real-time queue board, and automatic notifications.

Testing results using the SUS questionnaire on 30 prospective students showed an average score of 80, which falls into the “excellent” category and an A grade with an “excellent” rating. This score indicates that the designed prototype has a high level of acceptance and meets user needs in terms of ease of use and clarity of queue information. Thus, the Design Thinking method has proven effective in producing a user-centered UI design for the PMB queue

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system and is worthy of further development.

Based on the findings and limitations of this study, the following recommendations are proposed:

1. For UWDP, the resulting prototype can be implemented as a full-fledged web application by integrating the existing prospective student database. It is recommended to conduct pilot testing before the official launch to identify any technical issues that may arise.
2. For Future Researchers, testing with a larger sample size (at least 100 respondents) and broader scope (including cross-device and cross-operating system testing) can enhance the generalizability of the results.
3. For UI/UX Practitioners, this study highlights the importance of involving all user groups (in this case, prospective students and the admissions committee) in the design process. Neglecting any one user group may result in suboptimal designs, as differing needs may conflict with one another.

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