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User Interface and User Experience Analysis of Kejar Mimpi Mobile Application using the User-Centered Design Method

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Abstract

User criticism on the Play Store revealed some flaws in the Kejar Mimpi App review. Observations were made on research that discussed the Kejar Mimpi Application, and it discovered that no prior research on User Experience and User Interface had been conducted. Interviews will be conducted to collect additional data, and the initial questionnaire will be distributed on May 6, 2022. Developers and designers use User-Centered Design (UCD) design methodologies to ensure that the product or system meets the users' needs. This study used the System Usability Scale (SUS) and User Experience Questionnaire (UEQ) methods or techniques to assess user interface and user experience. This research has produced as many as 24 design recommendations and a style guide. The final evaluation results measured using the SUS questionnaire increased the average value by 14,9% from a value of 67 (adjective rating Ok category, grade scale D, High Marginal category) to 77 (adjective rating Good, grade scale C, Acceptable category). The results of the UEQ also have gained an average increase in the ratio, where previously most were in below-average positions, now in good positions. Research on the user interfaces analysis and user experience of the Kejar Mimpi Application has the potential to be developed further. Therefore, the author has several suggestions that can be used for further research so that prototype part can be developed again to be more responsive and use different methods for evaluation of design results, such as Eye Tracking, Cognitive Walkthrough, and Heuristic Evaluation.

Keywords: User Interface; User Experience; User-Centered Design; Kejar Mimpi Application.

Introduction

According to the survey, Indonesia's most commonly used medium to access the internet is a cellular phone or smartphone [1]. Active smartphone users reached 3.2 billion in 2019, representing a 5.6% increase over the previous year, and are expected to reach 3.9 billion in 2022 [2]. The growing number of smartphone and internet users influences the development of mobile applications. Kejar Mimpi is one of the movements that began in 2019, intending to assist young Indonesians in improving their ability to achieve their dreams and face Industry 4.0 [3].

Several factors must be considered when designing an application, such as creating an appealing interface design and implementing and evaluating the system to be simple and comfortable as a feature of the User Interface (UI) and the User Experience (UX). The user interface is a link between the user and the system focusing on the visual aspect of an application, such as images, typography, and colour. At the same time, user experience is defined as a user's behaviour, thoughts, emotions, perceptions, and reactions while using a system or application [4].

However, reviewing the Kejar Mimpi app reviews on the Play Store discovered that users felt the app still needed improvement and needed improvement. As a result, interviews and preliminary questionnaires will be distributed to gather more information beginning on May 6, 2022. Previous research on the Kejar Mimpi applications was also examined, and it was discovered that there had never been any research on User Experience (UX) and User Interface (UI). Based on these issues, further research must be conducted to obtain a solution in the form of user satisfaction

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scores and prototype design recommendations. The User-Centered Design method was used in this study (UCD). To ensure that a product or system meets the needs of its users, developers, and designers employ the User Centered Design (UCD) design methodology [5]. The System Usability Scale (SUS) and User Experience Questionnaire (UEQ) methods were used to assess the user interface and user experience in this study.

This study aimed to determine the Kejar Mimpi Application's strengths and weaknesses in terms of user interface and user experience and gather information on user needs. Another goal is to obtain the results of an interview-based analysis of the Kejar Mimpi Application's user Interface and user Experience, as well as the level of user satisfaction measured using the System Usability Scale (SUS) and the User Experience Questionnaire (UEQ).

This study is limited in scope to be more focused, as it only focuses on the design and does not include the network and programming components. Figma is the software used to create the new design in this study. Figma is a web-based design tool for mobile and desktop applications [6]. Evaluation questionnaires are distributed online via Google Forms, and research results include user satisfaction scores and user interface design recommendations in the form of prototypes and user interface or style guides.

Method

This research was conducted through four steps of User-Centered Design (UCD); 1) Understanding the context of use, such as who will use the application, what they will use it for, and in what situations they will use it through an evaluation of the old design using a SUS and UEQ questionnaire and interviews. 2) Specify user requirements to identify user needs to achieve the application's goals by developing user personas and pain points experienced by users; 3) Design solutions is the process of creating design solutions based on user needs using a variety of design processes such as sketches, low-fidelity wireframes, high-fidelity wireframes, and prototypes; 4) Evaluating against requirements by evaluating the new design with the same testing technique as the initial user evaluation. According to [7], User Centered Design (UCD) has a relationship with information systems because it is part of the System Development Life Cycle (SDLC), where all design development focuses on the needs of end users. To define user needs, designers must collect user data through surveys, interviews, or observations.

The sample in this study was 27 Kejar Mimpi Application, active users. According to Faulkner in [8], 5 respondents will only reveal 55% of the problems, 15 respondents will reveal 90% of the problems, and 20 respondents will reveal 95% of the problems.

A. System Usability Scale (SUS)

The System Usability Scale is one of the usability testing techniques (SUS). The testing technique, which takes the form of a questionnaire, employs end users as respondents [9]. As a System Usability Scale (SUS) testing instrument, there are ten questions for benchmarks that can be used to test various products, one of which is a mobile application [10], as shown in **Table 1.**

Table 1. Questions of SUS

Question Code	Question Items	Scale
Q1	I think that I would like to use this system frequently	1-5
Q2	I found the system unnecessarily complex	1-5
Q3	I thought the system was easy to use	1-5
Q4	I think that I would need the support of a technical person to be able to use this system	1-5
Q5	I found the various functions in this system were well integrated	1-5
Q6	I thought there was too much inconsistency in this system	1-5
Q7	I would imagine that most people would learn to use this system very quickly	1-5
Q8	I found the system very cumbersome to use	1-5
Q9	I felt very confident using the system	1-5
Q10	I needed to learn a lot of things before I could get going with this system	1-5

There are several rules for calculating System Usability Scale (SUS) scores [11]:

1. The respondent's score of each odd-numbered question (1,3,5,7,9) will be reduced by one.
   X1 = score of each odd-numbered question – 1 (1)
2. The score of each even question (2,4, 6, 8, 10) obtained by 5 is deducted by the respondents' choices.
   X2 = 5 – score of each even question (2)
3. The System Usability Scale (SUS) score is calculated by adding the scores for each question item (maximum total contribution value = 40) and multiplying by 2.5 to obtain a total score of 100.
   X3 = (X1+X2) × 2.5 (3)
4. Divide the total score by the number of respondents to get the average score of all assessments.
   Final score = X3 / Number of respondents (4)

The calculation results in the System Usability Scale, which can be viewed from three perspectives: acceptability (level of acceptance by users), grade scale (A, B, C, D, and F), and adjective rating (worst imaginable, poor, ok, good,

excellent, and best imaginable [9]. The SUS score percentile rank also can be used to determine the calculation results, as shown in **Table 2.**

Table 2. SUS Score Percentile Rank

Grade	SUS Score Range
A	Score >= 80.3
B	Score >= 74 and <80.3
C	Score >=68 and <74
D	Score >=51 and <68
F	Score <51

B. User Experience Questionnaire

The User Experience Questionnaire (UEQ) is designed to obtain a quick and direct impression of a product from its users. The UEQ contains 6 indicators with 26 questions [12]:

1. Attractiveness refers to a product's appeal to a user.
2. Perspicuity refers to a product's ease of use and clarity.
3. Efficiency is related to the ability to complete a task with minimal effort.
4. Dependability refers to a user's feelings about a product.
5. Stimulation is related to the product's desire and motivation to be used.
6. Novelty is related to product novelty, whether innovation or creativity.

The questionnaire is available online at www.ueq-online.org, the official User Experience Questionnaire (UEQ) website. Aside from being simple to use, the User Experience Questionnaire (UEQ) also includes Data Analysis Tools in.xls format [12]. The display of the Data Analysis Tool is shown in **Figure 1.**

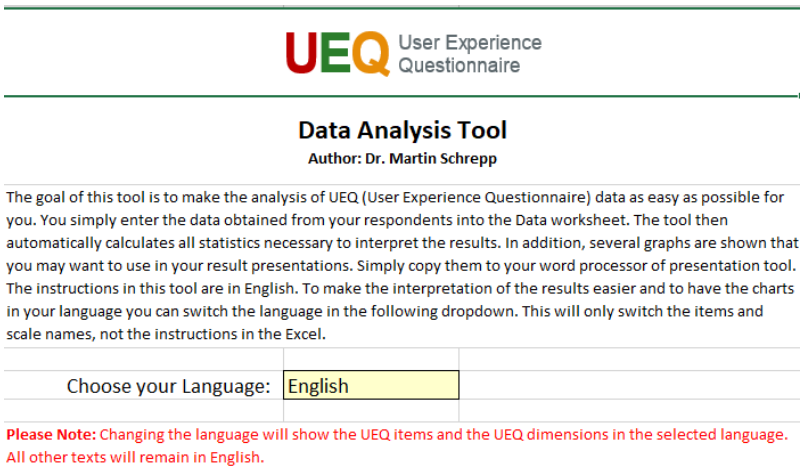


Figure 1. The Display of The Data Analysis Tool

C. Semi-Structured Interview

Semi-structured interviews, which are part of the category of in-depth interviews, are used when the boundaries of the topic to be researched are known [13]. Five users were interviewed to determine their pain points, opinions, and suggestions for the Kejar Mimpi application. The following is a list of interview questions:

1. Have you ever used or heard about the Kejar Mimpi application?
2. How long have you been using the Kejar Mimpi application?
3. What is your goal in using the Kejar Mimpi application?
4. How frequently do you use the Kejar Mimpi application?
5. What benefit do you get from the Kejar Mimpi application?
6. What challenges did you encounter while using the Kejar Mimpi application?
7. What do you think of the Kejar Mimpi application's design?
8. What are your suggestions for the overall and visual development of the Kejar Mimpi application?

Results and Discussion

The study results and discussion will be carried out following the stages of the User-Centered Design Method.

A. Understand Context of Use

1) Preliminary SUS Analysis Results

The results of the System Usability Scale (SUS) questionnaire, including the scores of each respondent, are shown in **Table 3.**

Table 3. SUS Analysis Result

Respondents	Questions									
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
R1	2	3	4	1	4	2	2	2	3	5
R2	4	1	5	3	5	3	3	3	5	2
R3	3	2	4	3	4	4	5	1	3	2
R4	3	3	3	3	4	2	3	3	3	4
R5	2	1	4	2	3	2	3	2	3	2
R6	3	2	4	2	4	2	5	2	4	2
R7	4	1	3	1	4	2	4	4	4	2
R8	4	1	5	1	1	1	5	1	5	1
R9	3	2	4	2	4	3	4	1	4	3
R10	2	3	3	1	4	5	4	3	1	1
R11	4	1	4	3	4	2	4	2	4	2
R12	4	2	5	1	4	2	5	2	4	2
R13	5	2	5	1	4	1	2	1	5	2
R14	3	3	3	3	3	3	3	3	3	3
R15	3	2	2	3	2	2	2	3	2	2
R16	2	3	3	2	4	3	2	1	4	2
R17	5	1	5	1	4	1	5	1	5	1
R18	2	2	5	1	5	2	2	2	2	2
R19	4	2	4	4	3	2	4	3	3	3
R20	2	4	2	1	3	4	3	2	5	2
R21	3	3	4	5	3	3	3	4	3	5
R22	3	1	3	1	4	4	5	2	4	2

The results of calculating the scores in **Table 3** using Microsoft Excel according to the rules for calculating the System Usability Scale (SUS) are shown in **Table 4.**

Table 4. SUS Calculated Score

Calculated Score										Total	X3 (Total × 2.5)
Q1	*Q2*	*Q3*	*Q4*	*Q5*	*Q6*	*Q7*	*Q8*	*Q9*	*Q10*		
1	2	3	4	3	3	1	3	2	0	22	55
3	4	4	2	4	2	2	2	4	3	30	75
2	3	3	2	3	1	4	4	2	3	27	68
2	2	2	2	3	3	2	2	2	1	21	53
1	4	3	3	2	3	2	3	2	3	26	65
2	3	3	3	3	3	4	3	3	3	30	75
3	4	2	4	3	3	3	1	3	3	29	73
3	4	4	4	0	4	4	4	4	4	35	88
2	3	3	3	3	2	3	4	3	2	28	70
1	2	2	4	3	0	3	2	0	4	21	53
3	4	3	2	3	3	3	3	3	3	30	75
3	3	4	4	3	3	4	3	3	3	33	83
4	3	4	4	3	4	1	4	4	3	34	85
2	2	2	2	2	2	2	2	2	2	20	50
2	3	1	2	1	3	1	2	1	3	19	48
1	2	2	3	3	2	1	4	3	3	24	60
4	4	4	4	3	4	4	4	4	4	39	98
1	3	4	4	4	3	1	3	1	3	27	68
3	3	3	1	2	3	3	2	2	2	24	60
1	1	1	4	2	1	2	3	4	3	22	55
2	2	3	0	2	2	2	1	2	0	16	40
2	4	2	4	3	1	4	3	3	3	29	73
Total											**1465**
Final score = X3/Number of respondents = 1465/22 = 67											

The final score of the respondent's evaluation of the current Kejar Mimpi Application is 67, indicating that the level of acceptance by the user (acceptability) is in the High Marginal category, the grade scale level is in the C category, and the rating system (adjective rating) is in the Ok category.

2) Preliminary UEQ Analysis Result

Researchers used the UEQ Data Analysis Tool provided by UEQ to obtain the results of the questionnaire analysis. The assessment was based on 22 respondents' responses to indicators of attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty, as shown in **Table 5** and **Figure 2.**

Table 5. UEQ Analysis Result

Scale	Mean	Comparisson to benchmark	Interpretation
Attractiveness	1.08	Below average	50% of result better, 25% of result worse
Perspicuity	1.18	Below Average	50% of result better, 25% of result worse
Efficiency	1.10	Above Average	25% of result better, 50% of result worse
Dependability	1.03	Below Average	50% of result better, 25% of result worse
Stimulation	1.05	Above Average	25% of result better, 50% of result worse
Novelty	0.86	Above Average	25% of result better, 50% of result worse

3) Interview Analysis Result

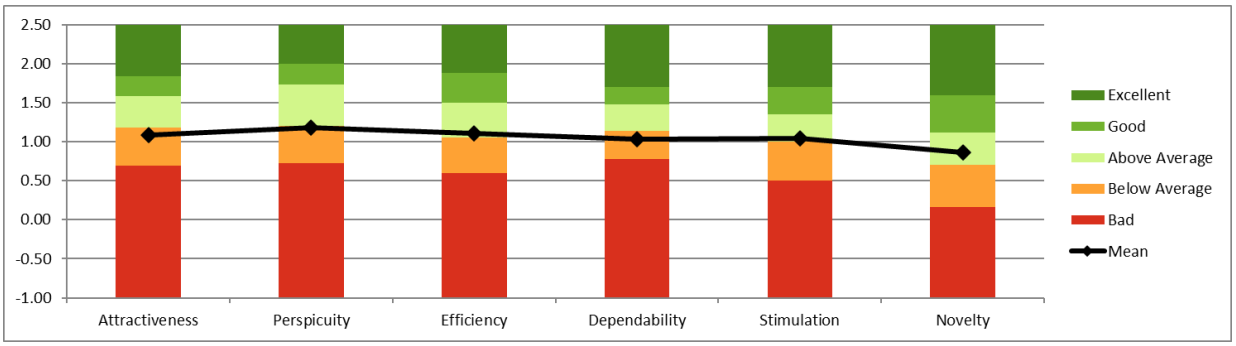


Figure 2. UEQ Benchmark Result

Table 6. Interview Conclusions

Question Code	Conclusions
Q1	All respondents are users of the Kejar Mimpi application.
Q2	The usage period of each respondent varies, ranging from one month to two years.
Q3	Five respondents used the Kejar Mimpi Application to find inspiration and motivation through articles; to find self-interest; to learn more about features; to find self-development activities; and to find job opportunities.
Q4	Three respondents use the Kejar Mimpi application frequently. There is one once every three days, twice a week, and once a month. However, two respondents say they rarely use the Kejar Mimpi application.
Q5	Five respondents said the benefits they receive are consistent with their goals for using the Kejar Mimpi application, such as gaining new insights for content, improving writing skills, a better understanding of self-interests, and learning about activities to help them develop.
Q6	Three out of five respondents said they had no problems using the Kejar Mimpi application. However, two respondents reported difficulties, specifically confusion when using the Kejar Mimpi application and the application's slow performance.
Q7	The appearance of the Kejar Mimpi application was quite appealing, according to five respondents, but it still needed development.
Q8	Made the display more appealing by improving it; adding secondary colors and suggestions to the search page; adding a direct mentoring feature; adding a feature that allows contributor writers to exchange points for cash; and creating a profile view.

B. Specify User Requirements

1) User Persona

A realistic description of application user representatives, including name, photo, behavior, goals, motivations, difficulties, and anything else required [14]. The results of five interviews conducted using the Kejar Mimpi Application then were used to create a user persona, as shown in **Figure 3.**

Figure 3. User Persona

2) Pain Point

The problems encountered by users are grouped into pain points, which provide solutions to these problems, as shown in **Table 7.**

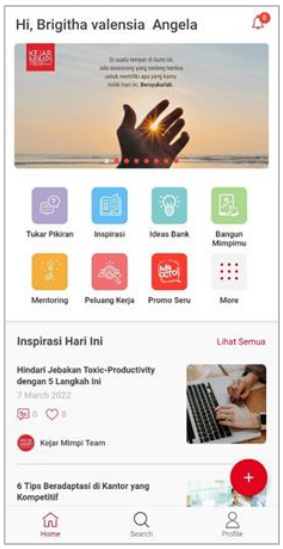
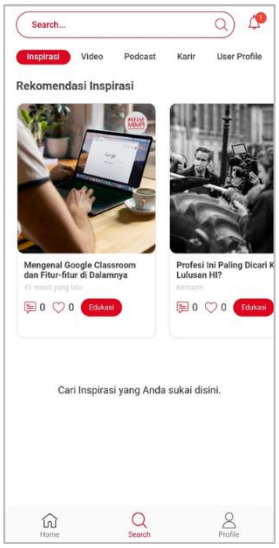
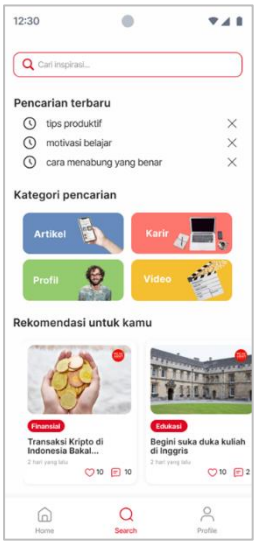
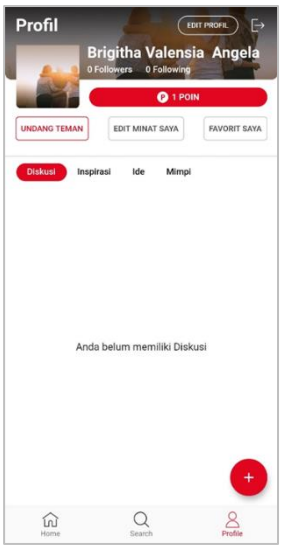
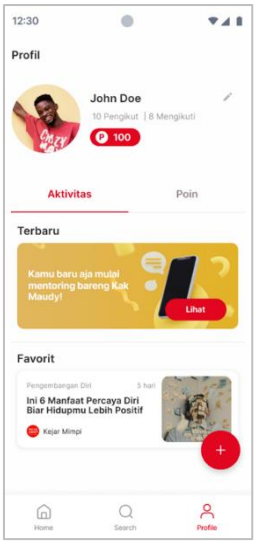
Table 7. Pain Points and Solutions

Pain Point	Solutions
Users believe that the appearance of the Kejar Mimpi applications should be improved. Users believe that they do not receive an explanation for the application's features. Users identify one feature that does not meet their expectations, namely the mentoring feature. Users believe the application's colors are too monotonous. Users believe the main page display, particularly search and profiles, is not optimal.	Enhance the appearance of the Kejar Mimpi application to make it more appealing. Explain the features of the Kejar Mimpi application. Add a new feature called "Start Mentoring", which can provide a direct mentoring experience. Using extra or secondary colors from the Kejar Mimpi application Creating search views by providing recommendations and maximizing profile views.

C. Design Solutions

At this point, the sketches and wireframes created will be used as a reference for designing the user interface. Figma is the tool used to create a user interface design. The comparison between current design and design recommendation is shown in **Table 8.**

Table 8. Design Comparison

Current Design	Design Recommendation
	
Current Design	**Design Recommendation**
	
	

Please visit bit.ly/AplikasiKejarMimpi to see a more complete design and try out a recommended design prototype. Prototype is a method for developing a product with a design that aims to test the product's work process before it is used by the user [15]. You can also scan this barcode to see the prototype, as shown in **Figure 4.**

Figure 4. Prototype Design Barcode

D. Evaluation Against Requirements

1) SUS Analysis Result II

Table 9. SUS Analysis Result II

Repondents	Questions									
	Q1	*Q2*	*Q3*	*Q4*	*Q5*	*Q6*	*Q7*	*Q8*	*Q9*	*Q10*
R1	2	3	4	1	4	2	5	2	3	5
R2	5	2	4	3	5	3	5	3	5	3
R3	3	2	4	3	4	4	5	1	3	2
R4	3	3	3	3	4	2	3	3	3	4
R5	2	1	4	2	3	2	3	2	3	2
R6	3	2	4	2	4	2	5	2	4	2
R7	4	1	5	1	4	2	4	2	4	2
R8	4	1	5	1	5	1	5	1	5	1
R9	3	2	4	3	4	2	4	1	4	3
R10	2	3	4	3	3	2	3	2	4	2
R11	4	1	4	3	4	2	4	2	4	2
R12	4	2	5	1	4	2	5	2	4	2
R13	5	2	5	1	4	1	5	1	5	2
R14	4	2	5	1	5	2	5	1	5	2
R15	3	1	5	4	4	3	4	1	4	2
R16	2	3	3	2	4	3	2	1	4	2
R17	5	1	5	1	4	1	5	1	5	1
R18	5	2	5	1	5	1	5	1	5	1
R19	4	2	4	4	4	2	4	3	3	3
R20	2	4	3	1	3	4	3	2	5	2
R21	4	2	5	1	5	1	4	1	5	1
R22	3	1	4	1	4	2	5	1	4	1

The results of calculating the scores in **Table 9** using Microsoft Excel according to the rules for calculating the System Usability Scale (SUS) are shown in **Table 10.**

Table 10. SUS Calculated Score II

Calculated Score										Total	X3 (Jumlah × 2,5)
Q1	*Q2*	*Q3*	*Q4*	*Q5*	*Q6*	*Q7*	*Q8*	*Q9*	*Q10*		
1	2	3	4	3	3	4	3	2	0	25	63
4	3	3	2	4	2	4	2	4	2	30	75
2	3	3	2	3	1	4	4	2	3	27	68
2	2	2	2	3	3	2	2	2	1	21	53
1	4	3	3	2	3	2	3	2	3	26	65
2	3	3	3	3	3	4	3	3	3	30	75
3	4	4	4	3	3	3	3	3	3	33	83
3	4	4	4	4	4	4	4	4	4	39	98
2	3	3	2	3	3	3	4	3	2	28	70
1	2	3	2	2	3	2	3	3	3	24	60
3	4	3	2	3	3	3	3	3	3	30	75
3	3	4	4	3	3	4	3	3	3	33	83
4	3	4	4	3	4	4	4	4	3	37	93
3	3	4	4	4	3	4	4	4	3	36	90

Calculated Score										Total	X3 (Jumlah × 2,5)
Q1	*Q2*	*Q3*	*Q4*	*Q5*	*Q6*	*Q7*	*Q8*	*Q9*	*Q10*		
2	4	4	1	3	2	3	4	3	3	29	73
1	2	2	3	3	2	1	4	3	3	24	60
4	4	4	4	3	4	4	4	4	4	39	98
4	3	4	4	4	4	4	4	4	4	39	98
3	3	3	1	3	3	3	2	2	2	25	63
1	1	2	4	2	1	2	3	4	3	23	58
3	3	4	4	4	4	3	4	4	4	37	93
2	4	3	4	3	3	4	4	3	4	34	85
Jumlah											**1673**
Final score = X3/Number of respondents = 1673/22 = 77											

The final score of the respondent's evaluation of the current Kejar Mimpi Application is 77, indicating that the level of acceptance by the user (acceptability) is in the Acceptable category, the grade scale level is in the C category, and the rating system (adjective rating) is in the Good category.

2) UEQ Analysis Result II

Table 11. UEQ Analysis Result II

Scale	Mean	Comparisson to benchmark	Interpretation
Attractiveness	1.71	Good	10% of results better, 75% of results worse
Perspicuity	1.80	Good	10% of results better, 75% of results worse
Efficiency	1.64	Good	10% of results better, 75% of results worse
Dependability	1.48	Above Average	25% of results better, 50% of results worse
Stimulation	1.72	Excellent	In the range of the 10% best results
Novelty	1.45	Good	10% of results better, 75% of results worse

3) Interview Analysis Result II

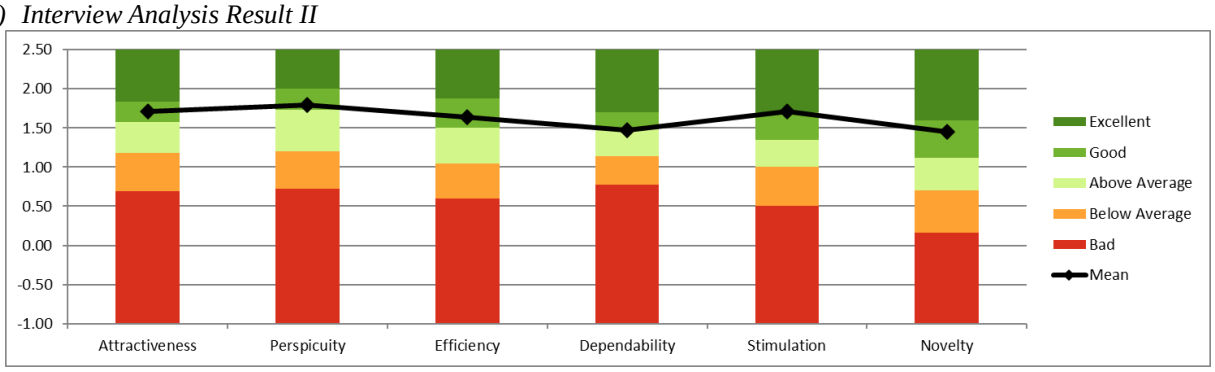


Figure 5. UEQ Benchmark Result II

The author's design recommendations were more interactive and interesting, according to the five respondents who responded positively. Furthermore, some of the features anticipated by respondents are already present in the design recommendations and match their expectations. UEQ measurements also result in a percentage increase in the average value, as shown in **Table 12.**

Table 12. UEQ Result Percentage

Indicators	UEQ Result I		UEQ Result II		Increase in Percentage
	Mean	*Description*	*Mean*	*Description*	
Attractiveness	1.08	Below average	1.71	Good	58,4%
Perspecuity	1.18	Below average	1.80	Good	52,5%
Efficiency	1.10	Above average	1.64	Good	49%
Dependability	1.03	Below average	1.48	Above average	43,6%
Stimulation	1.05	Above average	1.72	Excellent	63,8%
Novelty	0.86	Above average	1.45	Good	68,6%

Conclusion

In the research stage, this study employs the User Centered Design (UCD) method, which has resulted in 24 design recommendations accompanied by a style guide. Based on the evaluation result obtained from 22 respondents using the SUS questionnaire, there was a 14.9% increase, with the initial evaluation receiving an average score of 67 in the category of adjective rating OK with a grade scale of D and being included in the High Marginal category, increasing to 77 in the final evaluation with an adjective rating of Good, grade scale C, and being included in the Acceptable category.

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