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Analysis of the SwapEase Application Using the User Experience Questionnaire Method

Nisrina Qurratu Aini[1], Jumrianto[2], Dhega Febriharsa[3]

[1]Information System and Technology, Science and Technology, Ivet University, Jl. Pawiyatan Luhur IV No.16, Kec. Gajah Mungkur, Semarang City, 50253
e-mail: [1]nisrinaqaini21@gmail.com, [2]jumrianto.ivet@gmail.com, [3]febiharsa@gmail.com

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Abstract

The optimization of the SwapEase application needs improvement to ensure users have a satisfying experience. SwapEase supports digital clothing exchanges to reduce the impact of fast fashion. This research approach uses the User Experience Questionnaire (UEQ) method. Six main dimensions are measured: attractiveness, clarity, efficiency, dependability, stimulation, and novelty. A survey was conducted among active users, and the data were analyzed using the UEQ Data Analysis Tool version 12 to produce average scores and standard deviations for each dimension. The analysis results show that the Attractiveness dimension received an average score of 1.17, Clarity 1.05, Efficiency 1.13, Dependability 1.01, Stimulation 1.15, and Novelty 0.87. SwapEase excels in efficiency, stimulation, and novelty, with scores above the benchmark average, reflecting positive perceptions of the application's effectiveness and innovation. However, the dimensions of attractiveness, clarity, and dependability remain below average, indicating a need for improvements in visual appeal, usability, and reliability. By enhancing these less optimal aspects, SwapEase can better meet user needs and compete more effectively in the digital application market.

Keywords: UEQ; SwapEase Application; User Experience

1 Introduction

The development of information technology has brought significant changes across various aspects of human life (Lubis & Nasution, 2023). Digital applications have provided innovative solutions to various social and environmental issues, one of which is the problem of textile waste generated by the increasingly high volume of clothing production within the fashion industry (Putri, 2022). Textile waste is now recognized as the second worst water pollutant globally, following industrial waste (Arham et al., 2023). This poses a serious problem, as improper waste management can lead to substantial environmental degradation (Nidia & Suhartini, 2020). Textile waste continues to increase alongside the rise of the fast fashion phenomenon, where garments are produced and discarded in short cycles (Pratitis & Yumarnis, 2024). Moreover, the consumer-driven desire to constantly appear fashionable exacerbates this situation (Wagner & Heinzel, 2020). This consumerist trend is one of the primary factors driving the rise in textile waste volume (Abbate et al., 2023).

To address the fast fashion phenomenon, one innovative solution introduced is the SwapEase application. SwapEase is a digital platform accessible through Android devices. The purpose of SwapEase is to revitalize the culture of clothing exchange in Indonesia through a digital medium as a means to counteract fast fashion. SwapEase offers an easy-to-use clothing exchange option, providing consumers with an alternative way to stay fashionable without constantly purchasing new

garments, which contributes to the increasing volume of textile waste.

One of the key aspects to ensure a positive user experience (UX) for the SwapEase application is conducting an analysis using the User Experience Questionnaire (UEQ) (Khoirunnisa & Citra Sondari, 2024). Various studies have utilized the UEQ to evaluate user experience in various contexts, such as mobile applications, websites, and software (Siregar et al., 2024). The UEQ is a fast and reliable questionnaire used to measure user experiences with interactive products (Rahmadtul Ulfa & Ambarwati, 2022). An analysis of the user experience with the SwapEase application is essential to ensure that the app is user-friendly, appealing, and optimally meets user needs. A positive user experience can increase satisfaction, foster loyalty, and expand the user base (Nurtsani & Sarvia, 2022).

Compared to other methods such as the System Usability Scale (SUS) and Heuristic Evaluation, UEQ was chosen doe to its ability to assess hedonic and emotional aspects, which are essential for the SwapEase application as it emphasizes user engagement. The SUS method focuses solely on usability aspects such as effectiveness, efficiency, satisfaction, ease of learning, memorability, and minimal user errors, making it less capable of capturing users' emotional responses toward the application (Hiariej et al., 2022). Meanwhile, Heuristic Evaluation is more subjective as it relies on high-quality evaluators to determine whether an interface is good or bad based on predefined principles,(Siti et al., 2020) rather than real user experiences.

By conducting a UX analysis using UEQ, developers can identify areas that require improvement (Kurniawati et al., 2023). The data analysis results will provide conclusions across various evaluation scales, with each result rated from "poor" to "excellent," where the expected outcome is "excellent" (Putra & Rerung, 2023). Based on this background, a survey using the UEQ is necessary to identify aspects of the SwapEase application that need enhancement to ensure optimal performance

2 Method

This study will employ the User Experience Questionnaire (UEQ) method to comprehensively analyze the user experience of the SwapEase application. This questionnaire is designed to measure various key aspects of user experience, including attractiveness, which reflects the overall impression of the application; perspicuity, which assesses the ease of understanding and using the application; efficiency, which evaluates how quickly and effectively users can achieve their goals; dependability, which gauges the reliability and predictability of interactions; stimulation, which relates to the extent to which the application provides an enjoyable and engaging experience; and novelty, which measures the degree to which the application is considered innovative and interesting. The primary instrument in this research is the UEQ, consisting of 26 questions designed to cover these six essential aspects, as shown in Table 1.

Table 1. Key Aspect of the UEQ Research Instrument

Variable	Indicator	Item Instrument
Attractiveness	General impression of users	5 items
Perspicuity	Ease of use	4 items
Efficiency	Effectiveness and speed	4 items
Dependability	Reliability and trust	4 items
Stimulation	Attraction and pleasure	4 items
Novelty	Innovation and creativity	5 items

This study focuses on active users of the SwapEase application who download and use it regularly. Active users were selected because they have more extensive experience with the application, allowing them to provide a more accurate and relevant evaluation. The study is conducted on Android-based devices, where respondents download and install the SwapEase application from the Google Play Store, then use the application before completing the questionnaire. The research will be conducted online, and active users will receive the UEQ questionnaire via Google Forms.

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In this study, data analysis will be conducted using the UEQ Data Analysis Tool version 12, specifically designed to process UEQ questionnaire data (Hinderks et al., 2018). This software supports the processing of data from the UEQ instrument and generates comprehensive and in-depth reports on user experience (Khanza Pangestu et al., 2023).

To facilitate the research, a research flowchart will be created that details the steps involved in the UEQ analysis process for the SwapEase application. This flowchart will enable researchers to ensure that every aspect of the UEQ analysis process is covered thoroughly and systematically, as illustrated in Figure 1.

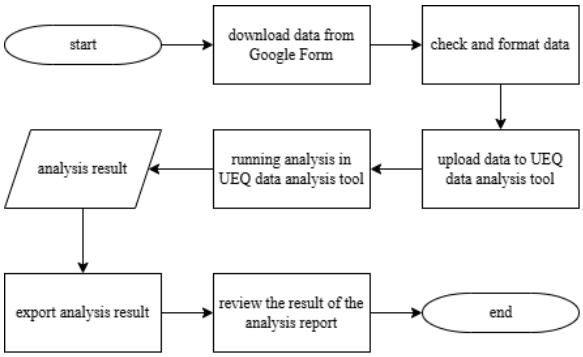

Figure 1. Research Flow

A. Data Preparation

The SwapEase application has 500 active users and the sample size will be determined using Slovin's formula.

$$n^2 = \frac{N}{I+N(e)2} \quad (1)$$

$$n^2 = \frac{500}{1+500(0,1)2} \quad (2)$$

$$n = 83 \quad (3)$$

Explanation:
n = Sample Size
N = Population Size
e = Margin of error (set at 10%)

Based on this calculation, the minimum requires sample size for this study is 83 respondents. However, to ensure greater accuracy and reliability, data will be collected from 101 respondents through the UEQ. Each response gathered will correspond to the six key aspects of the UEQ research instrument, namely attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. Each of these aspects will be measured using a Likert scale that includes various aspects of user experience, such as overall impression, ease of use, speed, reliability, enjoyment, and the level of innovation of the SwapEase application.

B. Analysis with the UEQ Data Analysis Tool

The downloaded data will then be imported into the UEQ Data Analysis Tool version 12 for comprehensive analysis. Subsequently, the tool will calculate the mean and standard deviation for each instrument (Marpaung & Nuraeni, 2023). The results of this analysis provide an overview of user perceptions regarding SwapEase across the six UEQ instruments. The UEQ Data Analysis Tool will generate visualizations in the form of radar charts and bar charts. These charts assist in understanding the distribution and comparison of results for each aspect of the user experience.

C. Reporting Result

After the analysis is complete, the report will include statistical details, such as the mean and standard deviation for each instrument, allowing for a detailed analysis of the distribution with radar charts that provide a comprehensive visualization of user perceptions. This will enable clear and intuitive comparisons among the different aspects.

3 Result and Discussion

The evaluation of user experience with the SwapEase application is conducted by measuring the six main aspects contained in the UEQ research instrument: Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. The analysis results for each aspect can be viewed comprehensively in Figure 2. Each aspect provides deeper insights into how users assess the application in terms of attractiveness, ease of use, speed, reliability, stimulation, and novelty. This evaluation aims to identify the strengths and weaknesses of the application, serving as a basis for enhancing the overall quality of user experience.

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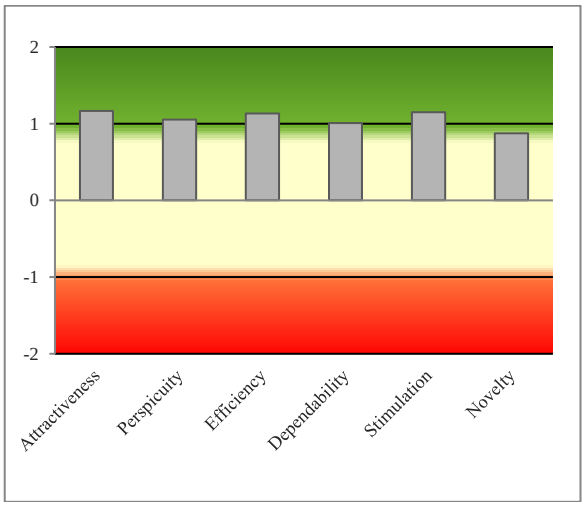

Figure 2. Chart of the Results for the Six Aspects of the UEQ Instrument

Each instrument in the UEQ is analyzed in depth to obtain accurate mean and standard deviation values, which are then used to assess the performance of the SwapEase application in each aspect. To facilitate interpretation, each item in the instrument is assigned a color corresponding to its aspect category, providing a clear visualization of the application's performance across each aspect. Subsequently, comprehensive calculations are performed for each aspect, including Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. The results of this data processing offer an in-depth view of user perceptions of SwapEase within each dimension measured by the UEQ, as shown in Figure 3

Item	Mean	Variance	Std. Dev.	No.	Left	Right	Scale
1	0,3	0,5	0,7	101	annoying	enjoyable	Attractiveness
2	0,2	0,7	0,8	101	not understandable	understandable	Perspicuity
3	1,8	1,8	1,3	101	creative	dull	Novelty
4	1,8	1,6	1,2	101	easy to learn	difficult to learn	Perspicuity
5	2,1	1,4	1,2	101	valuable	inferior	Stimulation
6	0,2	0,6	0,8	101	boring	exciting	Stimulation
7	0,3	0,6	0,8	101	not interesting	interesting	Stimulation
8	-0,1	0,7	0,8	101	unpredictable	predictable	Dependability
9	1,8	1,4	1,2	101	fast	slow	Efficiency
10	1,7	1,7	1,3	101	inventive	conventional	Novelty
11	0,3	0,5	0,7	101	obstructive	supportive	Dependability
12	2,1	1,5	1,2	101	good	bad	Attractiveness
13	0,2	0,8	0,9	101	complicated	easy	Perspicuity
14	0,2	0,6	0,8	101	unlikable	pleasing	Attractiveness
15	0,0	1,0	1,0	101	usual	leading edge	Novelty
16	0,3	0,5	0,7	101	unpleasant	pleasant	Attractiveness
17	1,9	1,4	1,2	101	secure	not secure	Dependability
18	2,1	1,3	1,1	101	motivating	demotivating	Stimulation
19	1,9	1,4	1,2	101	meets expectations	does not meet expectations	Dependability
20	0,3	0,6	0,7	101	inefficient	efficient	Efficiency
21	2,0	1,3	1,1	101	clear	confusing	Perspicuity
22	0,3	0,7	0,9	101	impractical	practical	Efficiency
23	2,1	1,2	1,1	101	organized	cluttered	Efficiency
24	2,0	1,1	1,1	101	attractive	unattractive	Attractiveness
25	2,1	1,3	1,1	101	friendly	unfriendly	Attractiveness
26	0,0	1,2	1,1	101	conservative	innovative	Novelty

Figure 3. Average Results of the UEQ Measurement

The average scores represent the mean responses from users across each aspect, including attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty. Higher average scores reflect a more positive user experience, while the variation in scores indicates the level of consistency in responses among users. Low variance suggests that user responses to the application are relatively uniform, whereas high variance indicates a broader range of perceptions among respondents.

Table 2. Average Scores and Scale Variance Results

UEQ Scales (Mean and Variance)		
Attractiveness	□ 1,168	0,57
Perspicuity	□ 1,054	0,66
Efficiency	□ 1,131	0,65
Dependability	□ 1,010	0,57
Stimulation	□ 1,151	0,57
Novelty	□ 0,874	0,66

A. Attractiveness Aspect

With an average score of 1.168 and a variance of 0.57, the attractiveness aspect indicates that users generally have a positive impression of the SwapEase application. This score suggests that users find the application appealing and enjoyable. The low variance signifies that user perceptions of the application's attractiveness are fairly uniform, indicating consistency in their evaluations of this aspect.

B. Perspicuity Aspect

The perspicuity aspect received an average score of 1.054 with a variance of 0.66. This score indicates that users feel the application is relatively easy to use and understand. However, the higher variance compared to other aspects suggests that there are differences in user experiences related to the clarity of the application, where some users may find the application less intuitive than others.

C. Efficiency Aspect

With an average score of 1.131 and a variance of 0.65, the efficiency of SwapEase is rated quite positively by users. This suggests that the application is perceived as fast and effective in helping users achieve their goals. However, the variation in efficiency ratings indicates that some users may have experienced challenges or a lack of efficiency in their interactions.

D. Dependability Aspect

An average score of 1.010 and a variance of 0.57 indicate that users feel SwapEase is fairly reliable. This means users believe that the application operates consistently and meets their expectations. The low variance also suggests that user perceptions of the application's dependability tend to be uniform, reflecting stable confidence in the application's reliability.

E. Stimulation Aspect

The stimulation aspect received an average score of 1.151 with a variance of 0.57, indicating that the application provides an engaging and enjoyable experience for users. The high score suggests that users feel intrigued and stimulated while using the application. Additionally, the low variance indicates that user opinions regarding the stimulation aspect are consistent, demonstrating a uniformly positive response.

F. Novelty Aspect

With an average score of 0.874 and a variance of 0.66, the novelty aspect received the lowest score among the other aspects. This suggests that the application may lack distinctiveness in terms of innovation and creativity from the users' perspectives. The relatively high variance in this aspect indicates significant differences in perceptions among users. This suggests that the experience of novelty has not been uniformly felt among all users of the application.

Analysis of the connection between three important aspects attractiveness, efficiency, and dependability was done in order to learn more about the elements that affect customer satisfaction.

A. Attractiveness and Efficiency

The attractiveness score (1.168) is slightly higher than efficiency (1.131), suggesting that visually appealing design can enhance usability perceptions. However, the higher variance in efficiency (0.65) compared to attractiveness (0.57) indicates less consistent perceptions of efficiency, with some users possibly encountering navigation difficulties or slow response times.

B. Attractiveness and Dependability

The attractiveness score (1.168) is higher than dependability (1.010), suggesting that while the application is visually appealing, users do not fully trust its reliability. The low variance (0,57)

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for both aspects indicates consistent perceptions, but high expectation for an attractive application may lead to disappointment if bugs of crashes occur.

C. Efficiency and Dependability

The efficiency score (1.131) is slightly higher than dependability (1.010), indicating that while the application is perceived as fast and effective, concerns about reliability remain. The higher variance in efficiency (0.65) compared to dependability (0.57) suggests a more varied user experience regarding efficiency, possibly due to technical factors such as server performance.

After obtaining the average scores for each measured variable, the next step is to compare this data with existing benchmark data. This comparison process aims to evaluate the relative quality of the SwapEase application in the context of user experience. By comparing the obtained results with benchmark standards, it becomes possible to identify the application's position within the same category and understand which areas require improvement or enhancement.

The results of this comparison provide deeper insights into the strengths and weaknesses of the SwapEase application, as well as assist the development team in formulating strategies to enhance the application's performance in the future. As shown in Figure 4, the visualization of these comparison results offers a clear picture of how the SwapEase application performs in relation to benchmark data, facilitating accurate analysis and decision-making

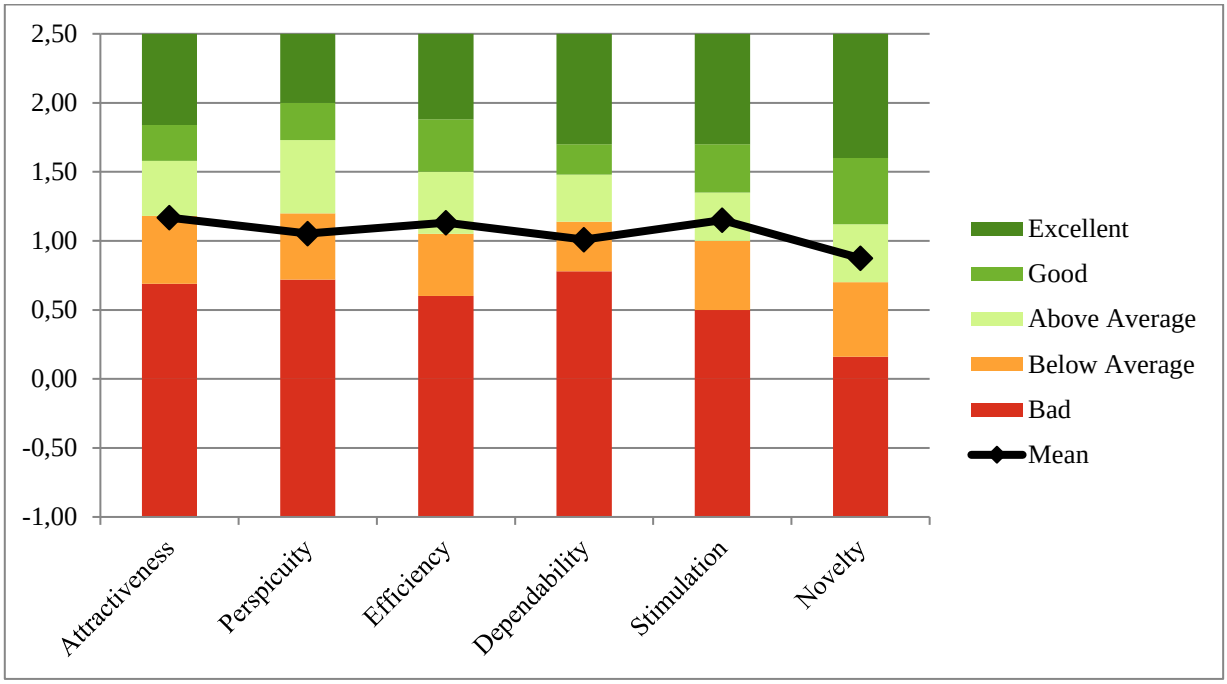

Figure 4. Chart of UEQ Benchmark Results

The Attractiveness and Perspicuity aspects indicate results that fall within the Below Average category. This means that 50% of other applications in the benchmark have better ratings in these two aspects, while only 25% are rated lower. This finding clearly shows that the SwapEase application needs significant improvements to enhance its attractiveness and ease of use for users. On the other hand, the Efficiency aspect shows performance in the Above Average category, indicating that this application has demonstrated quite good performance in terms of speed and effectiveness, surpassing more than 50% of similar applications available in the market. However, for the Dependability aspect, the results still fall within

the Below Average category, indicating that there is still considerable room for improvement regarding the reliability and trustworthiness of this application. Nevertheless, the SwapEase application records fairly high scores in terms of Stimulation and Novelty, both of which fall within the Above Average category. This suggests that the application is capable of providing a pleasant and creative experience for its users. In other words, SwapEase has succeeded in creating an engaging and innovative user experience, although it still needs to improve its attractiveness, usability, and reliability aspects. These findings can be seen more clearly in Table 3, which summarizes the results of the analysis and comparisons with other applications in the same category.

Table 3. Benchmark Results

Scale	Mean	Comparison to benchmark	Interpretation
Attractiveness	1,17	Below average	50% of results better, 25% of results worse
Perspicuity	1,05	Below Average	50% of results better, 25% of results worse
Efficiency	1,13	Above Average	25% of results better, 50% of results worse
Dependability	1,01	Below Average	50% of results better, 25% of results worse
Stimulation	1,15	Above Average	25% of results better, 50% of results worse
Novelty	0,87	Above Average	25% of results better, 50% of results worse

4 Conclusion

Based on the research conducted, the User Experience Questionnaire (UEQ) survey successfully identified aspects that need improvement to enhance user experience and the SwapEase application. The analysis results indicate that the Attractiveness aspect received an average score of 1.17, Perspicuity 1.05, Efficiency 1.13, Dependability 1.01, Stimulation 1.15, and Novelty 0.87. Among the six aspects Attractiveness, Perspicuity, and Dependability received scores categorized as below average, indicating the need for significant improvements in visual appeal, ease of use, and reliability. Conversely, Efficiency, Stimulation, and Novelty performed above average, demonstrating strengths in speed, engagement, and innovation.

To enhance user satisfaction, the development team should prioritize improving the weaker aspects while maintaining the strengths of the application. Several UX solution can be implemented to address these issues:

- Improve the user interface design by adopting a more modern and visually appealing aesthetic to create a more engaging and professional look.
- Enhance onboarding processes and introduce interactive tutorials to help new users navigate the application effortlessly. Implementing intuitive navigation and simplifying menus can make the application easier to use.
- Improve application stability by optimizing performance and reducing bugs or crashes. Regular updates, stronger backend infrastructure, and enhanced error-handling mechanisms can reliability and trust.

By addressing these areas effectively, SwapEase can provide a more intuitive, reliable, and visually appealing user experience, ultimately meeting user expectation, increasing engagement and improving overall usability.

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