Usability Evaluation of an E-Commerce Integrated with a Fan Community Platform Using Cognitive Walkthrough

Aida Khalisatifa [1]*, Ali Ibrahim [2]**
* Information Systems, Faculty of Computer Science, Universitas Sriwijaya, Indonesia
** Master of Computer Science, Faculty of Computer Science, Universitas Sriwijaya, Indonesia
akhalisatf@gmail.com [1], aliibrahim@unsri.ac.id [2]

Article Info	ABSTRACT
	This study aims to evaluate the usability and user experience of Weverse Shop e-commerce app after integration into Weverse app using the Cognitive Walkthrough and Post Study System Usability Questionnaire (PSSUQ) methods. Cognitive Walkthrough is used to identify usability issues from an expert perspective, while PSSUQ is used to quantitatively measure user experience through three subscales: System Usefulness, Information Quality, and Interface Quality. Participants in this study ran 7 task scenarios relevant to the application features. Based on the analysis results, the average scores for the PSSUQ subscales were 2.99 for System Usefulness, 2.98 for Information Quality, and 2.87 for Interface Quality, with an overall score of 2.95. These results indicate that the application interface still needs improvement, especially in the aspects of navigation and information delivery. This research provides recommendations for improvements to usability elements to increase user satisfaction.

I. INTRODUCTION

Currently, humans live accompanied by the development of information and communication technology which is increasingly widespread, thus bringing changes in several aspects, one of which is in transaction or shopping activities, including in the entertainment industry and e-commerce [1]. In the span of the last few years, the growth of e-commerce continues to experience a significant increase. According to data from [2], the number of e-commerce users in Indonesia is expected to continue to increase between 2024 and 2029, with a projected total of 33.5 million users (51.03%). This can show that e-commerce has become an important part of people's lifestyle, especially among the younger generation who are more familiar with digital technology.

In this context, the entertainment industry, especially the music industry, is also experiencing significant changes. With current advancements in modern technology, fans around the world can not only enjoy music through digital channels, but can also interact with their favorite artists and purchase related items, such as merchandise, albums, and more

conveniently by today's e-commerce industry dedicated to the fan community [3], [4].

One example of this e-commerce platform is Weverse Shop, which is very popular among K-Pop fans especially in Indonesia. Weverse Shop is an e-commerce that provides various official products, such as albums, merchandise, official membership, exclusive items, and concert tickets from various well-known artists who are under the entertainment company from South Korea, HYBE Corporation and are members of Weverse, such as BTS, TXT, Seventeen, Enhypen, Le Sserafim, aespa and others. Over time, the popularity of K-Pop has increased, including in Indonesia, which has made Weverse Shop grow rapidly into a platform that is widely used by fans to gain sexclusive access to their idols' products [5]. As per the UX Competitive Analysis [6] in [4], Weverse Shop holds the second position among the most popular online shops preferred by K-Pop fans for purchasing K-Pop merchandise. This is supported too by the achievement of 7.3 million downloads on the Play Store.

However, a significant change occurred when Weverse Shop, which initially operated as a separate app, was integrated into the Weverse app in May 2024. This was done

as part of HYBE Corp.'s way to provide the best customer experience by simplifying user interactions with products and artist content in one unified app [7]. Therefore, amid the global growth of fan community platforms, such as Lysn, Bubble, and Plus Chat, Weverse stands out by uniquely integrating e-commerce functionalities, enabling fans not only to interact with their favorite artists but also to purchase official merchandise directly [8], [9]. This integration distinguishes Weverse from other platforms and highlights the importance of evaluating its usability and user experience to ensure a seamless and satisfying user journey. As a result, the standalone Weverse Shop app discontinued so that it no longer had its own separate app, but became part of the Weverse app in the form of the "Shop" tab.

Despite this integration aimed to simplify users access to artists products and content, it also posed challenges, as some users felt that the approach was not effective enough. This is evidenced by the many complaints about the difficulties encountered in operating the Weverse Shop after the integration, creating a sense of unease among users regarding this change. Based on user reviews in Play Store comments and tweets on X social media, it is known that the integration between Weverse and Weverse Shop has caused some issues that have a significant impact on user experience. Users complain that navigation has become less intuitive, resulting in a decrease in the quality of user experience (UX). In addition, the new user interface (UI) is considered to be more complex and confusing. Users also face a more complicated process when trying to access their order history, leading to dissatisfaction among many users regarding the integration of this application. This is also supported based on an analysis of 31,861 Weverse user feedback data conducted using a text mining approach, showing that negative feedback was found that highlighted several obstacles faced by users, including delays in notifications or updates on booking status [10]. Overall, this suggests that the integration process has not gone smoothly and has resulted in a significant decrease in usability and user experience, which may ultimately affect user satisfaction with the app.

For this reason, it is necessary to evaluate the usability and user experience of the Weverse Shop application after the integration to identify areas that need to be improved, so that it can help increase user satisfaction. Because in addition to the aspect of functionality, usability and user experience (UX) are among the key elements in determining the success of an application, including e-commerce platforms [11]. Usability is defined as a quality measure based on the user's experience when interacting with a product or system [12]. Meanwhile, user experience based on [13] is defined as the behavior, thoughts, emotions, perceptions, and reactions of users before, during, and after using a system or application [14]. According to [15], user experience influences the concept of usability, where it is found that UX and usability are interconnected, for example whether UX expands or narrows the concept of usability.

In measuring the level of usability and user experience, the Cognitive Walkthrough and Post Study System Usability Questionnaire (PSSUQ) methods can be used. The selection of this method is based on previous research who evaluated the usability of a cancer registry system using the Cognitive Walkthrough method. This study successfully identified 114 usability problems, most of which were related to the unclear steps to be taken and the mismatch between system controls and expected user actions. The results showed that the Cognitive Walkthrough method was able to identify usability problems effectively without the need to involve users directly and the results obtained a high level of agreement from users [16]. In addition, in research by [17] using the PSSUQ questionnaire consisting of 16 questions as a tool to measure aspects of MY UT website usability, including overall satisfaction and specific subscales. The results of the study obtained that the SysUse scale received the lowest average score indicating that while the website can be used, there are areas that need to be improved.

Therefore, the application of a combination of the Cognitive Walkthrough and Post Study System Usability Questionnaire (PSSUQ) methods is intended so that complementary evaluations can be provided through methods from the user's perspective and from the expert's point of view [16]. Regardless of whether these two methods are used to evaluate usability, the use of the PSSUQ questionnaire can serve to measure the quality of the user experience of the application interface [18]. Meanwhile, the Cognitive Walkthrough method plays a role in finding specific points where users are likely to face difficulties when completing tasks based on expert evaluation. Based on the statements described above, this research focuses on usability evaluation using the Cognitive Walkthrough method supported by PSSUQ to get a comprehensive perspective.

II. METHODS

In the implementation of this research, there is a flow that is used as a reference so that the research runs in a structured manner. The research flow can be seen in Figure 1 below.
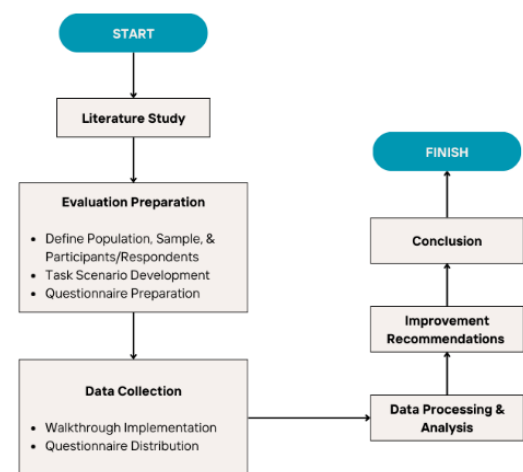

Figure 1. Research Flow

A. Literature Study

The literature study involved related journals, books, articles, official websites and research reports for further review, analysis and comparison with the ongoing research.

B. Evaluation Preparation

The evaluation preparation stage is carried out with several initial steps which include determining the population, sample, and participants or respondents who will contribute to the evaluation process, as follows:

1) Population and Sample

The population in this study consists of Weverse Shop application users in Indonesia. The selected sample was adjusted to align with the evaluation methods used in the study, namely Cognitive Walkthrough and Post Study System Usability Questionnaire (PSSUQ).

In the Cognitive Walkthrough method, the sample involves 5 people, because this number tends to be able to identify usability problems almost as much as possible as if using more participants [12]. Consequently, the participants required for this study are beginners or new users of the Weverse Shop application with an educational background in technology, so they are familiar with technology, websites, and user interfaces.

Meanwhile, the PSSUQ method is determined by Lemeshow's formula because the population is not known with certainty [19] with a maximum estimate of 50% and an error rate of 10%. The Lemeshow formula equation is:

$$n = \frac{z^2 \times p \times (1-p)}{d^2} \quad (1)$$

Where:
n is minimum sample size
z is Z score at 95% confidence (1.96)
p is maximum estimate (50% = 0.5)
d is error rate (10% = 0.1)

The sample calculation for the PSSUQ method using Lemeshow's formula is as follows:

$$n = \frac{(1.96)^2 \times 0.5 \times (1-0.5)}{(0.1)^2}$$

$$n = \frac{3.8416 \times 0.5 \times 0.5}{0.01}$$

$$n = \frac{0.9604}{0.01} = 96.04$$

Based on the calculation using the Lemeshow formula, a sample size of 96 respondents was obtained. However, this number may increase as the research progresses to achieve more credible results, as snowball sampling is employed—a sampling technique that begins with a small number of respondents and gradually expands over time [20].

2) Task Scenario Development

The task scenario in Table 1 is based on the features of the Weverse Shop app, so that the tasks can represent the main activities performed by users in the Weverse Shop app, allowing the evaluation results to reflect the actual challenges faced [21].

TABLE I
TASK SCENARIO FOR COGNITIVE WALKTHROUGH

Code	Task Scenario	Total Steps	Description
TS-1	Login	8	The initial and mandatory step to access all application features and ensure the process is easy and secure.
TS-2	Choosing an Artist Based on the Merch to Buy	4	To evaluate the ease of navigation and grouping of merchandise per artist according to user preferences.
TS-3	Select Shop Type by Region (Global, Japan or USA)	4	To ensure product availability, pricing, and shipping according to the user's location.
TS-4	Product Search	3	To evaluate the efficiency of product searches, allowing users to find relevant items.
TS-5	Adding Products to Cart	4	To ensure the flow of adding products to the cart is user-friendly.
TS-6	Making Payments	7	To assess the smoothness of the payment process, which is critical in e-commerce transactions.
TS-7	Check Order Status/History	3	To evaluate the accessibility and clarity of information related to order status or history.

3) Questionnaire Preparation

The questionnaire in Table 2 was developed by focusing on the Post Study System Usability Questionnaire (PSSUQ) instrument that assesses user experience (UX) after using the Weverse Shop application based on three main aspects, including System Usefulness (SysUse) for points 1-6, Information Quality (InfoQual) for points 7-12, Interface Quality (InterQual) for points 13-15, and overall satisfaction (Overall) from points 1-16 [22], [23]. This questionnaire is a 7 Likert scale, where scale 1 indicates "Strongly Agree" and scale 7 indicates "Strongly Disagree" [24].

TABLE II
THE PSSUQ QUESTIONNAIRE

No	Questions
1	Overall, I am satisfied with how easy it is to use the Weverse Shop app
2	It was simple to use the Weverse Shop app
3	I was able to complete the tasks and scenarios quickly using Weverse Shop app
4	I felt comfortable using Weverse Shop especially after it is integrated with the Weverse app
5	It was easy to learn to use Weverse Shop
6	I believe I could become productive quickly using the Weverse Shop app
7	The Weverse Shop app provides error messages that clearly told me how to fix problems
8	Whenever I made a mistake using the Weverse Shop app, I could recover
9	The information (such as online help, on-screen messages, and other documentation) provided with Weverse Shop app was clear
10	It was easy to find the information I needed at Weverse Shop
11	The information was effective in helping me complete the tasks and scenarios
12	The organization of information on the screens of Weverse Shop app was clear
13	The interface of the Weverse Shop app was pleasant
14	I liked using the interface of Weverse Shop app
15	Weverse Shop app has all the functions and capabilities I expect it to have
16	Overall, I am satisfied with the Weverse Shop app

The PSSUQ questionnaire generates four scores, consisting of one overall score and three subscale scores [25], as follows:
- Overall, to evaluate the system as a whole.
- System Usefulness (SysUse), a subscale used to evaluate the usability of the system, focusing on how easy the system is to learn and use.
- Information Quality (InfoQual), a subscale used to evaluate the quality of information, referring to how the system delivers error messages and provides guidance to correct errors.
- Interface Quality (InterQual), a subscale used to evaluate the quality of the system interface

Based on a collection of survey data from various products or systems, the PSSUQ norm table is obtained [24] which can be seen in Table 3 to be used as a reference material in interpreting the results of the PSSUQ score obtained. The lower the score, the better the system. Conversely, higher scores indicate poor system quality.

TABLE III
PSSUQ NORMS

Subscale	Items	Lower Limit	Mean	Upper Limit
SysUse	Item 1 - 6	2,57	2,80	3,02
InfoQual	Item 7 - 12	2,79	3,02	3,24
InterQual	Item 13 - 15	2,28	2,49	2,71
Overall	Item 1 - 16	2,62	2,82	3,02

C. Data Collection

The following are the steps involved in the data collection process:

1) Walkthrough Implementation

Each participant was asked to follow the steps in the task scenario and identify potential problems that might arise during user interaction. In the identification process, the authors used a checklist form developed by [16] to facilitate the evaluation process as shown in Table 4.

TABLE IV
CHECKLIST FORM

Goals	Actions	Questions			
		Q1	Q2	Q3	Q4
Selecting the appropriate region so that the products and delivery match the user's location.	1. Select the "Shop" option under the Artist's name.				
	2. Select the region that matches the location or shipping address preferences.				
	3. Ensure that the product list is updated according to the selected region.				
	4. Change the currency to KRW.				

This checklist form consists of the goals to be achieved when performing the task scenario, action details, and question items. The author will record any problems that arise while participants perform the assigned tasks. Then, the problems will be categorized based on the question items in the checklist form, which are based on research by [26], such as:
- Q1: Will the user try to achieve the right effect?
- Q2: Will the user notice that the correct action is available?
- Q3: Will the user associate the correct action with the effect that user is trying to achieve?
- Q4: If the correct action is performed, will the user see that progress is being made toward solution of the task?

2) Questionnaire Distribution

In this study, the PSSUQ questionnaire was distributed with the aim of obtaining responses from users who have directly interacted with the Weverse Shop app. The questionnaire was distributed online using Google Form.

III. RESULT AND DISCUSSIONS

A. Cognitive Walkthrough Data

Based on the data obtained using the Cognitive Walkthrough method, the data analysis process is carried out through the following steps:

1) Problem Mapping and Categorization

After collecting data, the problems found will be grouped using the problem form as in Table 5.

TABLE V
PROBLEM FORM

Task	Action	Questions	Participant Code	Problem Location & Desc
TS-2	ACT1	Q2	P02	**Loc: Main Page** The search bar's small size and inconspicuous placement on the main page reduce visibility, making it difficult for users to find.
TS-2	ACT2	Q2	P04, P05	**Loc: Main Page** The search bar is obstructed by ads and has an unnoticeable design, hindering the accessibility and use of the search feature.
TS-3	ACT2	Q1	P01, P05	**Loc: Main Page** Lack of explanation regarding the importance of region selection and mismatch with user expectations, hindering task completion.
TS-3	ACT2	Q2	P01	**Loc: Main Page** The region selection option is not visible, so users do not understand this step is necessary to continue the task.
TS-3	ACT2	Q3	P05	**Loc: Main Page** Users do not realize that the button is used to select the region, causing confusion during the product search process.
TS-3	ACT4	Q1	P05	**Loc: Sub Menu** Users do not realize that they need to change the currency setting before proceeding with the purchase, disrupting task flow.
TS-3	ACT4	Q2	P01, P03, P04, P05	**Loc: Sub Menu** The option to change the currency is hidden in a sub-menu with an inconspicuous design and small font, making it difficult to find.
TS-4	ACT1	Q2	P05	**Loc: Artist Page** Users expect a filter button to view product categories first, causing confusion when navigating without clear guidance in product search.
TS-6	ACT3	Q2	P02	**Loc: Cart Page** Two checkout buttons without a clear explanation of product grouping, making it difficult to determine the correct button for payment.
TS-6	ACT4	Q2	P03	**Loc: Checkout Page** Instructions to select a sub-payment method after the main method are not clearly visible.
TS-6	ACT6	Q1	P05	**Loc: Payment Page** The step to click "Request Payment" is not clearly visible.
TS-6	ACT6	Q2	P03	**Loc: Payment Page** The instructions to confirm the order are not

				prominent enough.
TS-6	ACT6	Q3	P05	**Loc: Payment Page** Lack of clear explanation for clicking "Request Payment," causing confusion in completing the payment process.
TS-6	ACT7	Q3	P02	**Loc: Payment Page** The confirmation message "transaction failed" appears repeatedly after the "back" button is pressed, creating a loop and hindering user navigation.

The identified problems were then mapped and grouped based on the Cognitive Walkthrough questions to understand the patterns of challenges faced by users. From the mapping in Table 5, three main patterns were identified as follows:

- Q2 (Will the user notice that the correct action is available?): There are 8 issues identified related to the visibility of important elements, such as the search bar, region selection option, currency change option, and payment instructions that are hidden or obstructed by other elements, making it difficult for users to find and use these features.
- Q1 (Will the user try to achieve the right effect?): There were 3 issues identified related to the lack of guidance on important steps such as region selection and currency change, and the low visibility of the "Request Payment" button, which hindered task completion.
- Q3 (Will the user associate the correct action with the effect that user is trying to achieve?): ?): There were 3 issues due to insufficient explanations and feedback, such as unclear region or "Request Payment" buttons and error loops that confused users without providing a solution.

2) Severity Rating Calculation

After all problems have been identified, the author will give the severity rating of the problem based on average the frequency of occurrence (F), impact on users (I), and persistence (P) as in Table 6. The scale used is based on Nielsen's severity rating method with a scale of 0-4 [16]. Where, each scale indicates:

0 = not a problem
1 = cosmetic problem only: need not be fixed unless extra time is available on a project

2 = minor usability problem: fixing this should be given low priority
3 = major usability problem: important to fix, so should be given high priority
4 = usability catastrophe: imperative to fix this before a product can be released

TABLE VI
PROBLEMS SEVERITY RATING

Code	Usability Problems	F	I	P	Severity Rating
M-1	Small and unobtrusive search bar	2	2	3	2,33
M-2	Search bar blocked by ads	1	2	2	1,67
M-3	Lack of explanation of region selection	2	3	3	2,67
M-4	Region options are not visible	1	3	1	1,67
M-5	Users are not aware of the region button	1	3	2	2,00
M-6	Users do not realize the need to change the exchange rate	1	2	3	2,00
M-7	The option to change the exchange rate is less prominent, making it difficult to find	4	2	3	3,00
M-8	No 'filter' button when you want to view product categories	1	2	1	1,33
M-9	Two confusing checkout buttons	1	3	1	1,67
M-10	Payment sub-method instructions are not clear	1	2	2	1,67
M-11	The "Request Payment" step is not visible	1	3	2	2,00
M-12	Order confirmation instructions are not prominent	1	2	1	1,33
M-13	"Request Payment" explanation is not clear	1	3	2	2,00
M-14	The message "transaction failed" appears repeatedly	1	4	3	2,67

Based on the results of the severity rating calculation in Table 6, it is concluded that there are several usability problems in the Weverse Shop application with the highest severity rating, including code M-7, which is the less prominent option to change the exchange rate (3.00), indicating problems in terms of poor interface. Code M-14, which is the "transaction failed" message that appears repeatedly (2.67), indicates a problem in terms of poor system usability. Also, code M-3, which is the lack of explanation about region selection (2.67), shows problems in terms of insufficient information quality. Therefore, some of these issues can be prioritized for improvement as they can have a direct impact on the smoothness of the transaction process and the way users interact with the Weverse Shop app.

B. Post Study System Usability Questionnaire Data

1) Respondent Distribution

After data collection in the period September 26, 2024 - October 15, 2024, the overall total data obtained was 271 data. However, after data cleaning, it was found that 63 data were declared invalid, so that the data that could be used to continue at the next stage was 208 data. The following is an overview of the respondent data that will be processed.

The pie chart in Figure 2 illustrates the distribution of PSSUQ respondent data based on gender. Of the 208 respondents, the majority were females, totaling 185 (88.94%), while males accounted for 23 (11.06%).
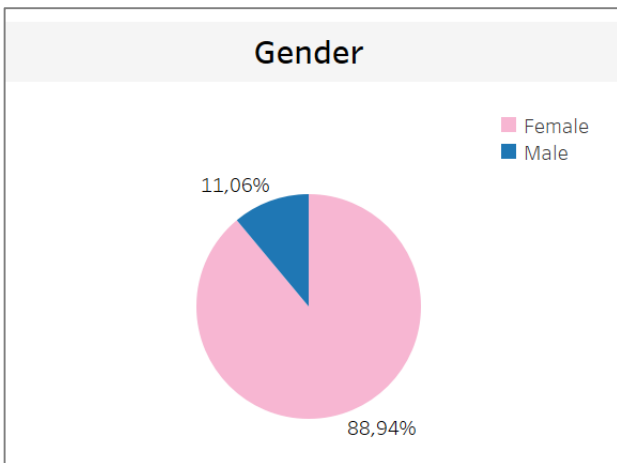

Figure 2. Gender Distribution of Respondents

The pie chart in Figure 3 shows the distribution of PSSUQ respondent data based on age. Respondents are divided into five groups, including 99 respondents aged 17-22 years (47.60%), 63 respondents aged 23-28 years (30.29%), 30 respondents aged 29-34 years (14.42%), 8 respondents aged 35-40 years (3.85%), and 8 respondents aged over 40 years (3.85%). This data indicates that the majority of respondents are aged 17-22 years.
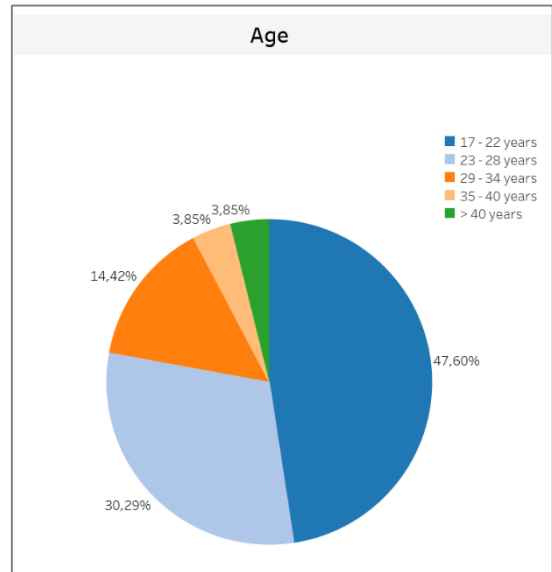

Figure 3. Age Distribution of Respondents

The graph in Figure 4 shows the distribution of PSSUQ respondent data based on experience or duration of application use. Respondents are divided into three groups: 91 respondents with a usage duration of less than 1 year (43.75%), 81 respondents with a usage duration of 1-3 years (38.94%), and 36 respondents with a usage duration of more than 3 years (17.31%). The data indicates that the majority of respondents are users who have used Weverse Shop for less than 1 year.
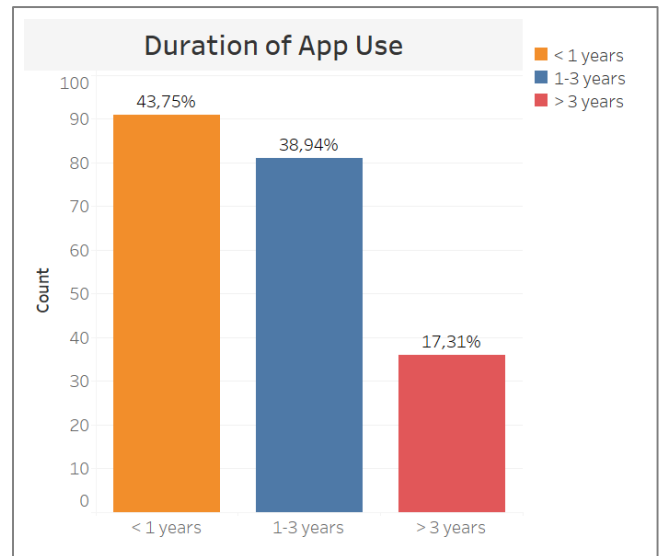

Figure 4. Respondents' Duration of App Use

2) Statistical Calculations

Statistical analysis was carried out by calculating the mean value of each PSSUQ subscale using Formula 2.

$$Subscale = \frac{Total\ Score\ for\ Subscale}{Number\ of\ Items\ in\ Subscale} \qquad (2)$$

The recapitulation of the total average score results of each subscale is shown in Table 7.

TABLE VII
PSSUQ SUBSCALE TOTAL RESULTS

Code	Subscale			
	SysUse	InfoQual	InterQual	Overall
R1	2,17	3,17	3,33	2,81
R2	2,67	2,50	2,00	2,44
R3	3,83	2,67	2,00	2,94
R4	2,33	1,67	2,00	2,00
R5	2,00	2,50	1,33	2,06
…	…	…	…	…
R269	1,83	1,67	1,33	1,69
R270	3,83	4,50	5,33	4,38
R271	3,17	3,67	3,00	3,38
Total Mean	2,99	2,98	2,87	2,95

The data in Table 7 shows that users have given assessments related to usability and user experience, where there is still room for improvement in several aspects of the Weverse Shop application, especially in the Interface Quality (InterQual) aspect.

In accordance with PSSUQ rules as in Table 8, where the lower the average score obtained, it shows that a system or application is getting better and vice versa.

TABLE VIII
COMPARISON OF RESULTS WITH PSSUQ NORMS

Subscale	Result	Lower Limit	Mean	Upper Limit	Note
SysUse	2,99	2,57	2,80	3,02	Upper Limit
InfoQual	2,98	2,79	3,02	3,24	Mean
InterQual	2,87	2,28	2,49	2,71	> Upper Limit
Overall	2,95	2,62	2,82	3,02	Upper Limit

By comparing the scores of each subscale with the PSSUQ norm, it is obtained that the value for System Usefulness (SysUse) is 2.99, indicating that the usability of the Weverse Shop application is poor, as it is close to the upper limit of the PSSUQ norm. The Information Quality (InfoQual) value is 2.98, which indicates that the quality of information in the Weverse Shop application is quite good because it is still at the average value of the PSSUQ norm. The Interface Quality (InterQual) value is 2.87, which indicates that the interface quality of Weverse Shop is bad because it exceeds the upper limit value from PSSUQ norms. Issues such as the low visibility of region selection buttons and currency change option are one of the main contributing factors. These design shortcomings hinder users from completing tasks efficiently and contribute to frustration during navigation. Lastly, the Overall value is 2.95, which indicates that the overall user satisfaction of Weverse Shop is poor because it is close to the upper limit from PSSUQ norms. Since the InterQual score exceeds the upper limit of the PSSUQ norms, this indicates

that the Weverse Shop app interface can still be improved to be more user-friendly.

C. Recommendations for Improvement

Based on the results of processing and analyzing the data obtained from the Cognitive Walkthrough and PSSUQ methods, recommendations for improvements can be given to things that are still usability problems in the Weverse Shop application as in Table 9.

TABLE IX
RECOMMENDED IMPROVEMENTS

Code	Problems	Recommendations
M-1	Small and unobtrusive search bar	Increase the size of the search bar and use more contrasting colors to make it easy to find.
M-2	Search bar blocked by ads	Change the layout of the search bar where it is easily accessible, such as at the very top of the page or in the top navigation bar, adjacent to the cart icon. Also, minimize the size of the ads so as not to disturb the user's focus.
M-3	Lack of explanation of region selection	Add a tooltip about why users should select a region.
M-4	Region options are not visible	Clarify the visibility of the button region with a more contrasting color.
M-5	Users are not aware of the region button	Add a clearer label to the button, such as "Shop Region".
M-6	Users do not realize the need to change the exchange rate	Add a reminder pop-up notification that appears after the user selects the desired region shop, for example "You've selected Global Shop, please change the currency to USD".
M-7	The option to change the exchange rate is less prominent, making it difficult to find	Make the option of changing the rate clearer with contrasting colors, larger fonts, and striking icons.
M-8	No 'filter' button when you want to view product categories	Add a filter feature to allow users to select products based on category, price, or popularity.
M-9	Two confusing checkout buttons	Clarify the appearance of the product list on the cart page for each section that can be checked out at the same time, so that the checkout button design can be distinguished, for example by color.
M-10	Payment sub-method instructions are not clear	Add payment icons for sub-methods under the main payment method icon, for example, the Alipay method is added with "Dana", "Gcash", "AlipayHK", or others.

M-11	The "Request Payment" step is not visible	Clarify the "Request Payment" button by using a contrasting color.
M-12	Order confirmation instructions are not prominent	Add an icon to the instructions or give it a slightly lighter color to make it stand out.
M-13	"Request Payment" explanation is not clear	Add tooltips or visual aids on the payment page.
M-14	The message "transaction failed" appears repeatedly	Improve error handling so that the system gives clearer error messages and add a button to return to the previous page without experiencing a loop error.

Table 9 outlines the improvement recommendations focusing on three main areas: navigation redesign, information enhancement, and new features to improve user experience. Recommendations such as increasing the size of the search bar (M-1), repositioning it for better accessibility (M-2), and enhancing the visibility of region options using contrasting colors (M-4) fall under navigation redesign to improve usability. Additionally, information enhancements include adding tooltips to clarify region selection (M-3), providing clearer payment method icons (M-10), and delivering more informative feedback on payment steps (M-11, M-13). Lastly, proposed new features, such as product search filters by category (M-8) and pop-up notifications for currency change reminders (M-6), aim to enhance the user experience by increasing efficiency and convenience in using the application.

IV. CONCLUSION

Based on the results of the research conducted on the usability and user experience evaluation of the Weverse Shop application using the Cognitive Walkthrough and Post Study System Usability Questionnaire (PSSUQ) methods, it can be concluded that although all task scenarios given to participants can be completed, there are significant obstacles in the aspect of the interface that is less intuitive, potentially reducing user comfort. The main problem identified was the lack of prominence of the option to change the exchange rate, with the highest severity rating of 3.00. Similarly, the repeated appearance of a "transaction failed" message received a rating of 2.67, and the lack of explanation about region selection also received a rating of 2.67.

This aligns with the score on the Interface Quality (InterQual) subscale of PSSUQ, which exceeds the upper limit of the PSSUQ norm with a score of 2.87. For System Usefulness (SysUse) was 2.99, close to the upper limit value, while Information Quality (InfoQual) was 2.98, which is above the lower limit value, with an overall score of 2.95. These scores suggest that the interface quality, in particular, exceeds the acceptable upper limit, highlighting areas for improvement to enhance user satisfaction and overall usability. Therefore, improvements are needed in the aspects of navigation, user interface, and information delivery, including feature and appearance updates, to increase efficiency, effectiveness, and user satisfaction.

However, it is important to note that the results of this study, which focuses only on Weverse Shop users in Indonesia, may not be fully applicable to global users. Although the Weverse Shop app has been downloaded 7.3 million times on the Play Store, this study only covers a small portion of the population. Therefore, while these findings provide relevant insights for the Indonesian context, further research with a wider sample of users is needed to evaluate whether these results can be generalized globally. Future research could consider using additional evaluation methods and adding a more complex variety of task scenarios to get a more comprehensive undesrtanding of the overall user experience.

REFERENCES

[1] D. Sinaga and P. Peniarsih, "Menghadapi Perubahan Dunia Melalui Transformasi Digital Menuju Kesuksesan pada Era Digitalisasi," *JSI (Jurnal sistem Informasi) Universitas Suryadarma*, vol. 11, no. 2, pp. 51–58, 2024.

[2] Statista, "Number of users of e-commerce in Indonesia 2020-2029," Statista Research Department. Accessed: Aug. 05, 2024. [Online]. Available: https://www.statista.com/forecasts/251635/e-commerce-users-in-indonesia#statisticContainer

[3] I. M. Insani, M. Iqbal, and M. A. Rakhman, "Dampak Budaya Korean Pop Dalam Perilaku Konsumerisme di Kalangan Penggemar K-Pop UKM Hallyu-Up Edutainment," *The Indonesian Journal of Social Studies*, vol. 7, no. 1, pp. 143–157, 2024.

[4] E. Alexandrina, L. Ramonita, and A. Anindita, "Understanding the motivation of purchase decision making of KPOP Seventeen's merchandise in Weverse Shop," *Jurnal Mantik*, vol. 8, no. 1, pp. 704–713, 2024.

[5] W. F. Putra and P. Febriana, "Penggunaan Aplikasi Digital Weverse sebagai New Media Interaksi antara Artis/Idol K-Pop dengan Para Penggemarnya Using the Weverse Digital Application as a New Media for Interaction between K-Pop Artists/Idols and their Fans," *Social Sciences (JEHSS)*, vol. 5, no. 3, pp. 1649–1659, 2023.

[6] A. Kumar, "UX Competitive Analysis — Weverse Shop," Medium. Accessed: Jul. 07, 2024. [Online]. Available: https://medium.com/@abhigyakumar/ux-competitive-analysis-weverse-shop-10a89d3740f6

[7] Weverse Company, "Weverse Shop: Notices," Weverse Shop. Accessed: Aug. 05, 2024. [Online]. Available: https://shop.weverse.io/en/notices/5588

[8] C. J. Hisyam, A. Nikita, A. N. Chotimah, J. F. Pasha, and N. S. Mulia, "Peran Platform Weverse Sebagai Sarana Interaksi Dan Ekonomi Dalam Industri K-Pop," *Jurnal Ekonomi dan Pembangunan Indonesia*, vol. 2, no. 3, pp. 76–86, 2024.

[9] T. Mastery, "Weverse – Top Ten Most Important Things You Need To Know," DotCom Magazine. Accessed: Jul. 07, 2024. [Online]. Available: https://dotcommagazine.com/about-dotcom-magazine/

[10] T. T. Van Ho, M. J. Noh, Y. N. Lee, and Y. S. Kim, "Analyzing User Feedback on a Fan Community Platform'Weverse': A Text Mining Approach," *Smart Media Journal*, vol. 13, no. 6, pp. 62–71, 2024.

[11] Z. B. Agustyn, S. Wibowo, and A. J. Furqon, "Usability Testing Aplikasi Getcontact Menggunakan Metode Post Study System Usability Questionnaire (PSSUQ)," *Jurnal Informatika dan Teknik Elektro Terapan*, vol. 12, no. 2, 2024.

[12] Jakob Nielsen, "Usability 101: Introduction to Usability," Nielsen Norman Group. Accessed: May 28, 2024. [Online]. Available: https://www.nngroup.com/articles/usability-101-introduction-to-usability/

[13] ISO 9241-210, "Ergonomics of human-system interaction—Part 210: Human-centred design for interactive systems," 2019.

[14] B. V. Angela, T. T. Wulansari, R. Riyayatsyah, Y. Fitrianto, and A. Rahim, "User Interface and User Experience Analysis of Kejar Mimpi Mobile Application using the User-Centered Design Method," *ILKOM Jurnal Ilmiah*, vol. 15, no. 1, pp. 1–10, 2023.

[15] K. Hornbæk and E. L.-C. Law, "Meta-analysis of correlations among usability measures," in *Proceedings of the SIGCHI conference on Human factors in computing systems*, 2007, pp. 617–626.

[16] F. Bagheri, F. Abbasi, M. Sadeghi, and R. Khajouei, "Evaluating the usability of a cancer registry system using Cognitive Walkthrough, and assessing user agreement with its problems," *BMC Med Inform Decis Mak*, vol. 23, no. 1, p. 23, 2023.

[17] M. Ridwan, M. Maulana, and D. Nurdiana, "Usability Testing Website MY UT Menggunakan Metode Post-Study System Usability Questionnaire Berdasarkan Pandangan Mahasiswa Universitas Terbuka," *Jurnal Sistem Informasi dan Informatika (Simika)*, vol. 7, no. 2, Jul. 2024, doi: 10.47080/simika.v7i2.3389.

[18] N.-C. Chi, A. Shanahan, K. Nguyen, I. Demir, Y.-K. Fu, and K. Herr, "Usability Testing of the PACE App to Support Family Caregivers in Managing Pain for People with Dementia," *Innov Aging*, vol. 7, no. Suppl 1, p. 857, 2023.

[19] P. S. Levy and S. Lemeshow, *Sampling of Populations: Methods and Applications*. in Wiley Series in Survey Methodology. Wiley, 2013. [Online]. Available: https://books.google.co.id/books?id=XU9ZmLe5k1IC

[20] D. Sugiyono, "Metode penelitian pendidikan pendekatan kuantitatif, kualitatif dan R&D," 2013.

[21] W. (Bill) Albert and T. S. (Tom) Tullis, "Chapter 4 - Performance Metrics," in *Measuring the User Experience (Third Edition)*, W. (Bill) Albert and T. S. (Tom) Tullis, Eds., Morgan Kaufmann, 2023, pp. 71–107. doi: https://doi.org/10.1016/B978-0-12-818080-8.00004-2.

[22] J. R. Lewis, "Usability testing," *Handbook of human factors and ergonomics*, pp. 1267–1312, 2012.

[23] J. R. Lewis, "Psychometric Evaluation of the PSSUQ Using Data from Five Years of Usability Studies," *Int J Hum Comput Interact*, vol. 14, no. 3–4, pp. 463–488, Sep. 2002, doi: 10.1080/10447318.2002.9669130.

[24] J. Sauro and J. R. Lewis, "Chapter 8 - Standardized Usability Questionnaires," in *Quantifying the User Experience*, J. Sauro and J. R. Lewis, Eds., Boston: Morgan Kaufmann, 2012, pp. 185–240. doi: https://doi.org/10.1016/B978-0-12-384968-7.00008-4.

[25] R. Suwandy, S. H. Marpaung, and C. Caroline, "Evaluasi Pengalaman Pengguna dengan Menggunakan Post Study System Usability Questionnaire (PSSUQ) Perpustakaan Digital Universitas Mikroskil," *Jurnal Pendidikan Tambusai*, vol. 6, no. 1, pp. 4190–4206, 2022.

[26] L.-O. Bligård and A.-L. Osvalder, "An Analytical Approach for Predicting and Identifying Use Error and Usability Problem," in *HCI and Usability for Medicine and Health Care*, A. Holzinger, Ed., Berlin, Heidelberg: Springer Berlin Heidelberg, 2007, pp. 427–440.