User Experience Evaluation of M-Paspor Using User Experience Questionnaire

Salsa Winanda
Informastion System
Faculty of Science and Technology
Sultan Syarif Kasim Riau State Islamic University
Pekanbaru, Indonesia
12050322147@students.uin-suska.ac.id

Tengku Khairil Ahsyar
Informastion System
Faculty of Science and Technology
Sultan Syarif Kasim Riau State Islamic University
Pekanbaru, Indonesia
tengkukhairil@uin-suska.ac.id

Angraini
Informastion System
Faculty of Science and Technology
Sultan Syarif Kasim Riau State Islamic University
Pekanbaru, Indonesia
angraini@uin-suska.ac.id

Megawati
Informastion System
Faculty of Science and Technology
Sultan Syarif Kasim Riau State Islamic University
Pekanbaru, Indonesia
megawati@uin-suska.ac.id

Abstract — This study evaluates the user experience (UX) of the M-Paspor application, a mobile government platform designed to simplify the online passport administration process and reduce queues at immigration offices. Despite offering convenience, M-Paspor has received numerous complaints regarding its services since its launch. The evaluation was conducted using the User Experience Questionnaire (UEQ) method, which measures six aspects: Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. The evaluation results indicate that Perspicuity and Attractiveness received the highest scores, at 1.783 and 1.728 respectively, reflecting that the application is easy to understand and visually appealing. However, Novelty received a low score of 1.030, suggesting a lack of innovation and fresh experiences for users. Other aspects, such as Efficiency, Dependability, and Stimulation, scored moderately well but still require improvements to enhance user engagement. Overall, M-Paspor application performs well in terms of usability and visual design but requires further innovation to enhance the user experience. Recommended improvements include enhancing efficiency, simplifying processes, and developing innovative features to deliver more optimal and satisfying services in the future.

Keywords—M-Paspor, User Experience (UX) Evaluation, User Experience Questionnaire (UEQ), Mobile Passport Administration, Application Usability and Innovation

I. INTRODUCTION

M-government represents an evolution of e-Government, enabling public services to be more flexible and accessible via mobile devices [1]. One implementation is the M-Paspor application, developed from the Online Passport Queue Registration Application (APAPO), designed to provide advanced features that help users avoid long queues at immigration offices. This application facilitates various administrative processes, such as passport application and renewal, without requiring a physical presence at the immigration office [2]. However, despite offering convenience, M-Paspor also faces challenges related to user satisfaction. Numerous complaints have emerged, particularly regarding technical issues such as login difficulties, data verification problems, delays in account verification code notifications, limitations in selecting passport application locations, and a lack of information on application quotas [3][4]. These complaints highlight the need to evaluate user experience to improve service quality.

The M-Paspor application was officially launched on December 29, 2021, and is available for download on Android through the Google Play Store. As of July 2024, the application has been installed on over 1 million devices. This high level of M-Paspor usage has resulted in a wide range of user reviews, both positive and negative. The app has an average rating of 2.3 out of 5, based on 31,029 user reviews, with 8,508 users giving it a 5-star rating, followed by 1,196 with 4 stars. A total of 1,276 reviews have a 3-star rating, while 2-star and 1-star ratings were given by 1,685 and 18,364 users, respectively. This data reflects user perceptions of M-Paspor's quality and performance, which still faces significant challenges regarding user satisfaction. A key factor

influencing this satisfaction level is the application's ease of use. Ease of use plays a crucial role, as it directly impacts user acceptance of a product [5][6]. Therefore, to create a positive user experience, an application needs to be designed to be easy to learn, efficient, user-friendly, and engaging [7].

User ease of use is an important element of the overall User Experience (UX) and plays a vital role in assessing an application success [8]. UX is Immediately related to the extent to which users perceive the ease, satisfaction, and benefits of an application [9]. According to ISO 9241-11:2018, UX is defined as the user's Perspicuity of a product or system, which includes emotions, beliefs, preferences, and behaviors while interacting with the product [10]. With the growing demand for high-quality UX, app developers are increasingly driven to focus on evaluating user experience to ensure that applications not only function optimally but also provide a high level of satisfaction [11][12].

An efficient way to assess UX is through the User Experience Questionnaire (UEQ), which offers a fast and effective tool for gathering quantitative data on users insight of a product or service [13]. UEQ measures various technical and nontechnical aspects, including user emotions and perceptions related to attractiveness, pragmatic quality, and hedonic quality. This method helps researchers obtain a comprehensive overview of UX strengths and weaknesses, which can be used as a basis for formulating improvement recommendations [14]. According to [15] compared to frameworks such as SUMI, SUS, and SUPR-Q, UEQ offers a broader evaluation, addressing both usability and user experience, and includes data analysis tools for more precise interpretation [16]. UEQ has been applied in various studies, such as evaluations business software [17], financial application [18], websites [19], and the entertainment sector [20].

In the context of the M-Paspor application, the use of UEQ is highly relevant for gaining a deeper understanding of users' perceptions regarding the application's comfort and efficiency. Through the UEQ evaluation, pragmatic aspects such as ease of use, as well as hedonic aspects like the pleasure experienced by users, can be systematically measured. The results of this evaluation are expected to identify areas for improvement, such as enhancing the interface, increasing access speed, or refining navigation features.

Therefore, this research will focus on evaluating the UX of the M-Paspor application using the UEQ method. It is hoped that the findings of this study will yield constructive recommendations to enhance the quality of user experience, thereby minimizing existing complaints and creating a more optimal service in the future.

II. METHOD

This research implements the UEQ method developed by [21]. This method involves several stages, as illustrated in Figure 1, and measures user experience based on several scales.
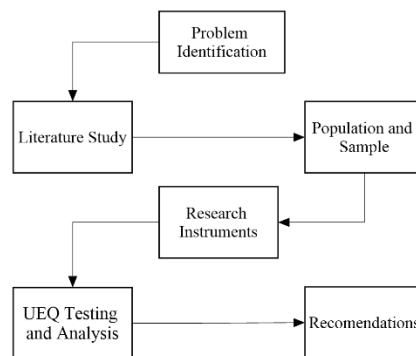

Figure 1. Research Methodology

A more complete description of the research activities is as follows:

A. Problem Identification

The initial phase of the research involved collecting qualitative data through direct observation of the M-Paspor application. Data was obtained from analyzing the reviews of users on the app's distribution platform as well as an in-depth exploration of the features available.

B. Literature Study

The UEQ is a tool used to support evaluation and complement data from other evaluation methods by providing a subjective assessment of qualities related to user experience. The tool is easy to use, precise, and accountable [22]. Based on UEQ ability to evaluate UX, this manuscript examines the interactive interface features of the M-Paspor application. This research is in line with various previous studies that examine UX in digital public services, such as the evaluation of the DISPENDUKCAPIL Service Information System [23], Smart Regency Mobile Apps service[24] and the LAPORPUB information system [25].

In a study conducted by Mujinga, the researcher evaluated the user experience of online banking using UEQ by collecting 725 survey responses in South Africa. The findings showed a high level of UX quality compared to the UEQ benchmark data. These results provide practical contributions for designers and developers of online banking in retail banks to optimize strengths and improve areas that need enhancement [26].

Another group of researchers evaluated the user experience of the Bstation Mobile application using SUS and UEQ. The results showed that all scales scored positively except for novelty, which remained at a neutral level. This indicates that while the Bstation Mobile application is reasonably good, it still requires improvements to enhance its optimal use [27].

C. Population and Sample Determination

The population size in this study was established based on the daily quota allocated by the immigration authorities, which was 250 applicants. The number of samples required was calculated using the Slovin formula [28] as follows.

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

Description:
n = Sample size
N = Population size
e = Margin of error

Based on the sample calculation with a margin of error of 10%, which is commonly applied to large populations, this study requires a minimum of 100 participants to obtain representative data. Therefore, the UEQ method is applied to 100 respondents.

D. Research Instrument

The research instrument used in this study is the UEQ questionnaire, accessed through the online platform https://www.ueq-online.org/. According to the UEQ development guidelines by [29], this questionnaire is structured based on pairs of attributes that have opposite meanings to represent various aspects of the product, as shown in Figure 2. The measurement of respondents' agreement levels with each attribute pair is conducted using a 7-point Likert scale.

Figure 2. UEQ Question Structure of the Indonesian version

The architecture of the UEQ can be seen in Figure 3. The UEQ measurement method consists of three primary categories: Attractiveness, Pragmatic Quality, and Hedonic Quality. Pragmatic Quality reflects the user's insight of the functional or utility aspects of a product, while Hedonic Quality relates to the users perception of the pleasure or emotional benefits gained from using the product. These three categories are then translated into six measurement scales, namely Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty.
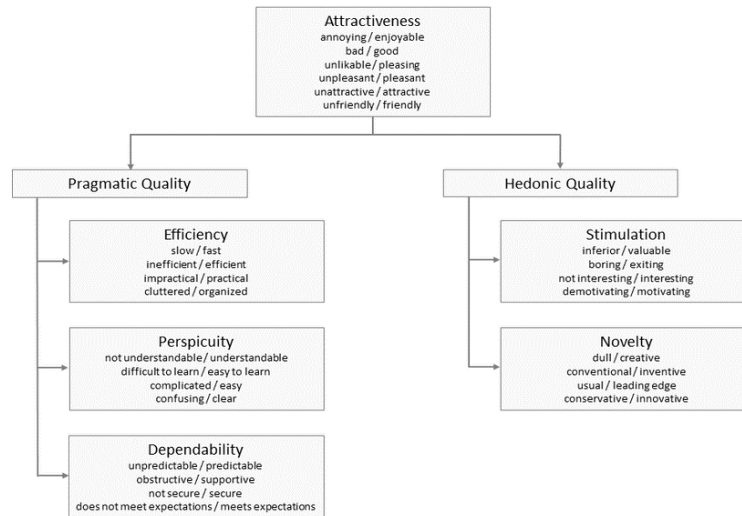
Figure 3. UEQ Scale Structure

E. UEQ Testing and Analysis

Data collected from the questionnaire distribution is analyzed using Data Analyst Tool version 12. This software automatically processes the UEQ questionnaire data, producing descriptive statistical values such as means and variances, and compares them with predetermined benchmark values [24]. Further statistical analysis is conducted to identify the dimensions of user experience that need improvement. The analysis results will be thoroughly examined to offer recommendations for improving the application.

F. Recommendations

Based on the analysis results, the researchers propose a series of improvements aimed at enhancing the application's user experience (UX) quality. These recommendations are

expected to be implemented by the application developers to enhance the user experience going forward.

III. RESULT AND DISCUSSION

Data collection on the user experience of the M-Paspor application was carried out through distributing questionnaires to passport applicants at the Class I TPI Immigration Office in Pekanbaru. The questionnaire data collected was then processed using UEQ Data Analysis Tool software for further analysis.

A. Inconsistencies in Data

A total of 118 respondents completed the questionnaire, after which the data underwent a cleaning and validation process. Through the Inconsistencies feature of the UEQ Data Analysis Tool, outlier data with inconsistency values exceeding a threshold of 3 were identified and removed. This process aims to verify the accuracy and reliability of the data used in the analysis. After data cleaning, a total of 100 valid respondent data were used in further analysis.

B. Data Analysis

The UEQ questionnaire data was transformed by subtracting 4 from each item score, resulting in a new scale ranging from -3 (highest negative value) to +3 (highest positive value). This transformation allows for more intuitive interpretation, where positive values indicate a good user experience, while negative values indicate a less favorable UX.

The mean value of each item on each UEQ scale (attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty) was then calculated. The results of this average calculation are presented in Table 1.

Table 1. Mean, Variance, and Standard Deviation Results

Item	Mean	Variance	Std.Dev.	No	Left	Right	Scale
1.	1.8	1.3	1.1	100	annoying	enjoyable	Attractiveness
2.	2.0	1.2	1.1	100	not understandable	understandable	Perspicuity
3.	1.0	2.9	1.7	100	creative	dull	Novelty
4.	1.7	1.9	1.4	100	easy to learn	difficult to learn	Perspicuity
5.	1.8	2.1	1.4	100	valuable	inferior	Stimulation
6.	1.6	1.4	1.2	100	boring	exciting	Stimulation
7.	1.7	1.3	1.2	100	not interesting	interesting	Stimulation
8.	1.2	2.2	1.5	100	unpredictable	predictable	Dependability
9.	1.1	3.0	1.7	100	fast	slow	Efficiency
10.	1.0	2.7	1.6	100	inventive	conventional	Novelty
11.	2.0	1.5	1.2	100	obstructive	supportive	Dependability
12.	2.0	1.5	1.2	100	good	bad	Attractiveness
13.	1.8	1.6	1.3	100	complicated	easy	Perspicuity
14.	1.5	1.5	1.2	100	unlikable	pleasing	Attractiveness
15.	1.0	2.5	1.6	100	usual	leading edge	Novelty
16.	1.9	1.0	1.0	100	unpleasant	pleasant	Attractiveness
17.	1.7	2.0	1.4	100	secure	not secure	Dependability
18.	1.7	1.5	1.2	100	motivating	demotivating	Stimulation
19.	1.6	1.4	1.2	100	meets expectations	does not meet expectations	Dependability
20.	1.7	1.6	1.3	100	inefficient	efficient	Efficiency
21.	1.7	1.7	1.3	100	clear	confusing	Perspicuity
22.	1.8	1.5	1.2	100	impractical	practical	Efficiency
23.	1.8	1.4	1.2	100	organized	cluttered	Efficiency
24.	1.5	1.4	1.2	100	attractive	unattractive	Attractiveness
25.	1.6	1.7	1.3	100	friendly	unfriendly	Attractiveness
26.	1.1	2.6	1.6	100	conservative	innovative	Novelty

Based on the data analysis in Table 1, the mean, variance, and standard deviation of the 26 UEQ items show that in general, respondents gave a positive assessment of each

item. The mean value on each item is subsequently used to compute the mean value for the six UEQ aspects (attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty). These calculations are presented visually in Figure 4 to identify the scales with the highest and lowest mean values, thereby highlighting which aspects of the user experience are strongest and which require improvement.
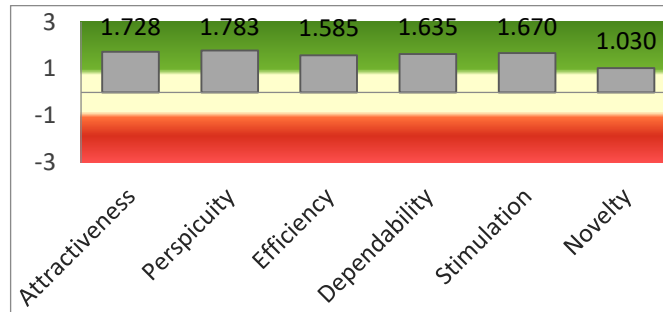

Figure 4. Six-Scale Mean Value Diagram

Based on Figure 4, the graph of the average values of the six UEQ scales shows positive results. All scales are in the green zone, indicating that overall, the app's user experience is rated favorably. The perspicuity scale has the highest score, while the novelty scale has the lowest score.

The perspicuity component is assessed based on items such as comprehensible, easy to learn, straightforward, and clear. All items scored above 1, categorized as good. For the novelty component, the score is based on items like creative, inventive, usual, and innovative, all of which scored at 1.

The six aspects allow for an evaluation of the app's pragmatic and hedonic qualities. Pragmatic quality consists of perspicuity, efficiency, and dependability, while stimulation and novelty represent hedonic quality. Ratings for attractiveness, as well as for pragmatic and hedonic quality, are presented in Table 2.

Table 2. Pragmatic and Hedonic Quality

Pragmatic and Hedonic Quality	
Attractiveness	1.73
Pragmatic Quality	1.67
Hedonic Quality	1.35

Among the three qualities, attractiveness has the highest score. Based on Table 2, the attractiveness score is around 1.73, which falls into the good category. This was accompanied by a hedonic quality score of 1.67 and pragmatic quality with a score of 1.35.

Table 3. M-Paspor Confidence Value Interval

Confidence intervals (p=0.05) per scale						
Scale	**Mean**	**Std. Dev.**	**N**	**Confidence**	**Confidence interval**	
Attractiveness	1.728	0.910	100	0.178	1.550	1.907
Perspicuity	1.783	1.066	100	0.209	1.574	1.991
Efficiency	1.585	1.014	100	0.199	1.386	1.784
Dependability	1.635	0.922	100	0.181	1.454	1.816
Stimulation	1.670	0.999	100	0.196	1.474	1.866
Novelty	1.030	1.094	100	0.214	0.816	1.244

Table 3 presents the results of the calculation of confidence intervals for the six measurement scales based on 100 respondent data. The confidence interval measures the uncertainty of a scale's average. A smaller confidence interval indicates higher confidence or precision in the average.

According to Table 3, the attractiveness scale has the smallest confidence interval, indicating that the average score for this scale is more reliable than for the other scales. Conversely, the novelty scale has the largest confidence interval, suggesting greater uncertainty in its average score.

In other words, the data from the attractiveness scale is more consistent and provides a more accurate estimate compared to the data from the novelty scale. This indicates that respondents provided more consistent ratings for the application's attractiveness than for its novelty.

C. Benchmark Results

Benchmark analysis is conducted to compare the user experience of the M-Paspor application with similar applications that have being tested using the UEQ instrument. Benchmarks for the M-Paspor user experience as shown in Table 4 and Figure 5. Table 4 shows the position of the M-Paspor UEQ assessment compared to similar studies. Based on Table 4, the highest value is found on the perspicuity scale, while the lowest score is on the novelty scale.

Table 4. Benchmark evaluation M-Paspor

Scale	Mean	Comparison to Benchmark	Interpretation
Attractiveness	1.73	**Good**	10% of results better, 75% of results worse
Perspicuity	1.78	**Good**	10% of results better, 75% of results worse
Efficiency	1.59	**Good**	10% of results better, 75% of results worse
Dependability	1.64	**Good**	10% of results better, 75% of results worse
Stimulation	1.67	**Good**	10% of results better, 75% of results worse
Novelty	1.03	**Above Average**	25% of results better, 50% of results worse

This assessment is then represented in a diagram to facilitate the observation of each scale's ratings. The benchmark diagram for M-Paspor can be seen in Figure 5.
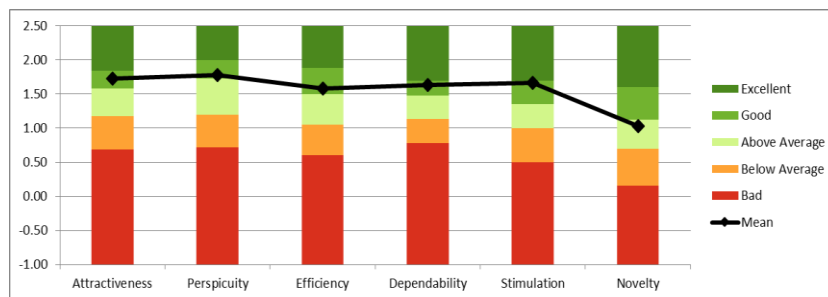
Figure 5. M-Paspor benchmark diagram

Figure 5 represents the benchmark assessment of M-Paspor. Based on Figure 5, five scales have good scores and one scale has an above-average score. Good scores are owned by attractiveness, perspicuity, efficiency, dependability, and stimulation scales, while above-average scores are owned by novelty.

D. Recommendations

According to the UX analysis and evaluation conducted by researchers using the UEQ method, the following recommendations can be made for M-Paspor:

1. Address issues with the login and data verification processes by improving the authentication mechanism, such as implementing simpler authentication methods like verification via WhatsApp or SMS.
2. Enhance the notification system to ensure users receive important information in a timely manner, including passport application status, passport collection schedules, and availability of quotas.
3. Implement a feedback collection system that allows users to provide direct input, enabling developers to better understand user needs and expectations.
4. Evaluate the online passport application process flow and identify steps that can be simplified to enhance the efficiency of the process.

IV. CONCLUSION

Based on the UEQ evaluation results for the M-Paspor application, it is evident that the Perspicuity and Attractiveness aspects received the highest scores, with mean scores of 1.783 and 1.728, respectively. This indicates that users find the application relatively easy to understand and visually appealing. However, the relatively low score in Novelty (mean 1.030) suggests that the application has yet to provide significant innovation or a unique experience for users. Additionally, while Efficiency, Dependability, and Stimulation have fairly good scores, there is still room for refinement, particularly in enhancing user efficiency and providing more stimulation to increase user engagement. Overall, these results indicate that the M-Paspor application performs well in terms of usability and appearance, but it still requires further innovation to enhance the user experience and introduce new, engaging, and more efficient features.

REFERENCES

[1] C. Wang, T. S. H. Teo, and L. Liu, "Perceived value and continuance intention in mobile government service in China," *Telemat. Informatics*, vol. 48, no. January, p. 101348, 2020, doi: 10.1016/j.tele.2020.101348.

[2] P. Assiroj, A. Mahendra Putra, N. P. Ayu Yuniartika Dewi, B. Mega Rahmaningtis, and I. Afifah, "Socialization Of The M- Passport Application To Minimize Difficulties In Using The M-Passport At The Class Ii Immigration Office In Wonosobo," *JaIM J. Abdimas Imigrasi*, vol. 03, pp. 20–24, 2022, doi: https://doi.org/10.52617/jaim.v3i1.431.

[3] J. D. Primasari Pamadi, D. S. Kusuma Dewi, and E. W. Dj, "Evaluasi Implementasi E-Government Di Kantor Imigrasi Kelas Ii Non Tempat Pemeriksaan Imigrasi Ponorogo," *Moderat J. Ilm. Ilmu Pemerintah.*, vol. 8, no. 4, pp. 756–768, 2022, doi: 10.25157/moderat.v8i4.2855.

[4] I. Nurkumalawati and M. S. Rofii, "Public Review of M-Paspor Application in Indonesia: Mobile Government, Digital Resilience, Cyber Security," *Proc. Fifth Annu. Int. Conf. Bus. Public Adm. (AICoBPA 2022)*, pp. 404–412, 2023, doi: 10.2991/978-2-38476-090-9_32.

[5] R. Parente Da Costa, E. Di. Canedo, R. T. De Sousa, R. De Oliveira Albuquerque, and L. J. Garcia Villalba, "Set of Usability Heuristics for Quality Assessment of Mobile Applications on Smartphones," *IEEE Access*, vol. 7, no. c, pp. 116145–116161, 2019, doi: 10.1109/ACCESS.2019.2910778.

[6] M. D. Revansa, A. Angraini, T. K. Ahsyar, and S. Syaifullah, "EVALUATION OF USER EXPERIENCE (UX) HNI MOBILE USING THE THINK ALOUD METHOD," *J. Tek. Inform.*, vol. 5, no. 4, pp. 141–148, Jul. 2024, doi: 10.52436/1.jutif.2024.5.4.2120.

[7] A. Hinderks, M. Schrepp, F. J. Domínguez Mayo, M. J. Escalona, and J. Thomaschewski, "Developing a UX KPI based on the user experience questionnaire," *Comput. Stand. Interfaces*, vol. 65, no. July, pp. 38–44, 2019, doi:

10.1016/j.csi.2019.01.007.

[8]   F. Aini, F. Muttakin, T. K. Ahsyar, and E. Saputra, "Analisis Kepuasan Pengguna Aplikasi DANA Menggunakan Metode TAM dan EUCS," *J. Sist. Cerdas*, vol. 6, no. 1, pp. 65–76, 2023, doi: 10.37396/jsc.v6i1.288.

[9]   H. Petrie and N. Bevan, "The evaluation of accessibility, usability, and user experience," *Univers. Access Handb.*, pp. 20-1-20–16, 2009, doi: 10.1201/9781420064995-c20.

[10]   International Organization Standardization, "ISO 9241-11_2018(en), Ergonomics of human-system interaction — Part 11_ Usability_ Definitions and concepts," *Online Browsing Platform*, 2018. https://www.iso.org/obp/ui/en/#iso:std:iso:9241:-11:ed-2:v1:en (accessed Jan. 20, 2024).

[11]   Z. Mack and S. Sharples, "The importance of usability in product choice: A mobile phone case study," *Ergonomics*, vol. 52, no. 12, pp. 1514–1528, 2009, doi: 10.1080/00140130903197446.

[12]   F. S. Hamdi, Syaifullah, E. Saputra, and M. Jazman, "User Experience Analysis of Adobe Lightroom Application for Photographers Using the Heart Framework Method," *J. Teknol. Sist. Inf. dan Apl.*, vol. 7, no. 3, pp. 1151–1159, 2024, doi: 10.32493/jtsi.v7i3.41295.

[13]   M. Schrepp, A. Hinderks, and J. Thomaschewski, "Design and Evaluation of a Short Version of the User Experience Questionnaire (UEQ-S)," *Int. J. Interact. Multimed. Artif. Intell.*, vol. 4, no. 6, p. 103, 2017, doi: 10.9781/ijimai.2017.09.001.

[14]   A. Butkovic, G. McArdle, and M. Bertolotto, "A Framework to Measure User Experience of Geoportals," *Conf. Int. East. Conf. Human-Computer Interact. (IECHCI2023*, vol. 31, no. 2, pp. 158–164, 2015.

[15]   H. B. Santoso, M. Schrepp, R. Yugo Kartono Isal, A. Y. Utomo, and B. Priyogi, "Measuring user experience of the student-centered E-learning environment," *J. Educ. Online*, vol. 13, no. 1, pp. 1–79, 2016.

[16]   A. D. Nariswari, A. Faroqi, and T. L. M. Suryanto, "Evaluasi User Experience Aplikasi Digital Banking Jenius Menggunakan Metode User Experience Questionnaire (UEQ)," *Jutisi J. Ilm. Tek. Inform. dan Sist. Inf.*, vol. 13, no. 1, p. 574, 2024, doi: 10.35889/jutisi.v13i1.1756.

[17]   M. R. A. Soelistyo, D. F. Naufal, Muhammad Rifqi Murad, and S. A. Murad, "Improving User Experience Using User Experience Questionnaire Method on Online Attendance Super HANA Application," in *2023 IEEE 9th International Conference on Computing, Engineering and Design (ICCED)*, 2023, pp. 1–6.

[18]   T. Alisya, E. Hamzah, Muhammad Luthfi Saputra, T. K. Ahsyar, and Syaifullah, "Evaluation of User Experience on ShopeePay Digital Wallet Using System Usability Scale (SUS) and User Experience Questionnaire (UEQ) Methods," in *2023 3rd International Conference on Emerging Smart Technologies and Applications (eSmarTA)*, 2023, pp. 1–6. [Online]. Available: https://ieeexplore.ieee.org/document/10293705

[19]   A. A. Lee, A. M. Rachmat, Felice, and M. Ramadhani, "Evaluation of Indorelawan.org Website in User Experience Perspective using User Experience Questionnaire (UEQ)," *Proc. 2023 Int. Conf. Inf. Manag. Technol. ICIMTech 2023*, no. February, pp. 544–549, 2023, doi: 10.1109/ICIMTech59029.2023.10277756.

[20]   D. Wulan, Syaifullah, E. Saputra, M. Rahmawita, and A. Marsal, "Analysis of User Experience of the CapCut Application in Generation Z for Social Media Content Using the User Experience Questionnaire Method," *Sci. J. Informatics*, vol. 11, no. 3, pp. 721–732, 2024, doi: 10.15294/sji.v11i3.7543.

[21]   M. Schrepp, A. Hinderks, and J. Thomaschewski, "Construction of a Benchmark

for the User Experience Questionnaire (UEQ),” *Int. J. Interact. Multimed. Artif. Intell.*, no. June, 2017, doi: 10.9781/ijimai.2017.445.

[22] B. Laugwitz, T. Held, and M. Schrepp, “Construction and evaluation of a user experience questionnaire,” *Lect. Notes Comput. Sci. (including Subser. Lect. Notes Artif. Intell. Lect. Notes Bioinformatics)*, vol. 5298 LNCS, pp. 63–76, 2008, doi: 10.1007/978-3-540-89350-9_6.

[23] S. M. Gucci and F. Adnan, “Evaluation Of User Experience And Recommendation Of Improvements To The Jember DISPENDUKCAPIL Service Information System With UEQ Method,” *INFORMAL Informatics J.*, vol. 7, no. 2, p. 109, 2022, doi: 10.19184/isj.v7i2.32111.

[24] A. K. Darmawan, M. A. Hamzah, B. Bakir, M. Walid, A. Anwari, and I. Santosa, “Exploring Usability Dimension of Smart Regency Service with Indonesian Adaptation of the System Usability Scale (SUS) and User Experience Questionnaire (UEQ),” *2021 Int. Conf. Comput. Sci. Inf. Technol. Electr. Eng. ICOMITEE 2021*, no. October, pp. 74–79, 2021, doi: 10.1109/ICOMITEE53461.2021.9650086.

[25] M. Ariansidi, I. M. Candiasa, and I. M. G. Sunarya, “Analisis Usability Pada Sistem Informasi LAPORBUP Menggunakan Performance Measurement , Retrospective Think Aloud dan User Experience Questionnaire,” *Kaji. Ilm. Inform. dan Komput.*, vol. 3, no. 6, pp. 754–764, 2023, doi: 10.30865/klik.v3i6.807.

[26] M. Mujinga, “Online Banking User Experience: A User Experience Questionnaire (UEQ) Assessment in South Africa,” *Indones. J. Inf. Syst.*, vol. 6, no. 2, pp. 117–129, 2024, doi: 10.24002/ijis.v6i2.8606.

[27] S. A. Wulandari, M. L. Hamzah, E. Saputra, T. K. Ahsyar, and Syaifullah, “Evaluation Usability and User Experience (UX) of Bstation Mobile Applications,” in *2023 3rd International Conference on Emerging Smart Technologies and Applications (eSmarTA)*, 2023, pp. 1–7.

[28] Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif dan R&D*, no. April. ALFABETA, 2013.

[29] Martin Schrepp and J. Thomaschewski, “Handbook for the modular extension of the User Experience Questionnaire,” 2023.