

A Usability Analysis of the KBStar Mobile Banking Application Based on User Interface Aspects

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Abstract

E-money transactions will increase in 2023. This is reflected in Bank Indonesia (BI) data which recorded that the value of shopping transactions via electronic money reached IDR 166.60 trillion as of October 2023, or up 5% from the previous month, and up 25% on an annual basis. So, this research aims to determine the level of usefulness of the KBStar Bank KB Bukopin application in the form of an assessment of statements based on the heuristic evaluation method. The research results based on measuring the level of usability in the user interface aspect of the KBStar Bank KB Bukopin Application with variable components are declared to be categorized in the "Feasible" criteria. Furthermore, the results of this research also show that of the 10 heuristic evaluation aspects, all of them are in the good category so this shows that the KBStar Bank KB Bukopin Application can be used well by internal Bank Bukopin employees as internal sampling.

Keywords: User Interface, Heuristic Evaluation, Usability, Banking Application, KBStar

Abstrak

Transaksi e-money pada tahun 2023 mengalami peningkatan. Hal ini tercermin dari data Bank Indonesia (BI) yang mencatat nilai transaksi belanja melalui uang elektronik mencapai Rp 166,60 triliun per Oktober 2023, atau naik 5% dari bulan sebelumnya, dan naik 25% secara tahunan. Penelitian ini bertujuan untuk mengetahui tingkat usabilitas dari aplikasi KBStar Bank KB Bukopin dalam bentuk penilaian atas pernyataan-pernyataan yang didasarkan oleh metode heuristic evaluation. Hasil penelitian berdasarkan pengukuran tingkat usabilitas pada aspek user interface dari Aplikasi KBStar Bank KB Bukopin dengan komponen variabelvariabel yang sudah dibentuk, dan dinyatakan masuk dalam kriteria "Layak". Selanjutnya hasil penelitian ini juga menunjukkan bahwa dari 10 aspek evaluasi heuristik, seluruhnya termasuk kategori baik sehingga hal ini menunjukkan bahwa Aplikasi KBStar Bank KB Bukopin dapat digunakan dengan baik oleh karyawan internal Bank Bukopin sebagai sampel internal.

Kata Kunci: Antarmuka Pengguna, Evaluasi Heuristik, Kebergunaan, Aplikasi Banking, KBStar

I. INTRODUCTION

The rapid growth of information and communication technology has significantly transformed human activities, particularly in the financial and banking sectors. One of the most influential factors driving this transformation is the increasing penetration of internet usage. Reports published by We Are Social and Hootsuite indicate that, as of January 2023, global internet users reached 5.16 billion people, representing 64.4% of the world's population, while Indonesia recorded approximately 213 million internet users or 77% of its total population [1][2]. This phenomenon has accelerated the adoption of digital services, including digital banking and mobile financial applications. Digital banking has become a strategic necessity rather than an optional service. Previous studies have demonstrated that digital innovation in banking positively affects customer satisfaction, trust, loyalty, and long-term retention [3][4]. Mobile banking applications, in particular, play a critical role in shaping user perceptions of service quality due to their direct interaction with users on a daily basis [5]. However, the success of mobile banking services is not solely determined by functional completeness but also by the usability and quality of the user interface (UI).

Bank KB Bukopin has implemented digital transformation through the KBStar mobile banking application, which consolidates several previous applications into a single integrated platform. This transformation aims to improve service efficiency, transaction speed, and user convenience. Nevertheless, as mobile banking systems grow in complexity, usability issues may arise, such as unclear navigation, inconsistent interface elements, insufficient system feedback, and inadequate error handling [6][7]. These issues may negatively affect user satisfaction and task effectiveness if not properly evaluated. Usability evaluation is therefore essential to ensure that digital banking applications meet user expectations. According to ISO 9241-11, usability is defined as the extent to which a system can be used by specified users to achieve specified goals effectively, efficiently, and with satisfaction in a specified context of use [8]. Among various usability evaluation techniques, heuristic evaluation based on Nielsen's ten usability heuristics is widely recognized as an efficient and systematic method for identifying usability problems in interactive systems [9][10].

This study employs a hybrid usability evaluation approach combining heuristic-based user perception analysis and quantitative usability assessment. While traditional heuristic evaluation involves expert inspection, this study adapts Nielsen's principles into measurable indicators assessed through user responses to capture perceived usability from internal users' perspectives. It is important to note that this study does not fully implement classical heuristic evaluation conducted by usability experts. Instead, it adopts a perception-based heuristic assessment approach. Therefore, the findings reflect perceived usability rather than objective usability inspection results. The KBStar application is selected as the research object because it represents an ongoing digital transformation initiative within a national banking institution and has not yet been extensively evaluated using heuristic principles, particularly from the perspective of internal users. Internal employees are chosen as respondents because they interact intensively with the system, possess deeper operational knowledge, and understand the underlying business processes, enabling a more objective and comprehensive usability assessment [11]. The objective of this research is to evaluate the usability level of the KBStar application based on Nielsen's heuristic principles, identify heuristic aspects that require improvement, and provide recommendations to support Bank KB Bukopin in enhancing the quality of its digital banking services.

II. LITERATURE REVIEW

Usability has been widely acknowledged as a key success factor in the adoption and continued use of mobile banking applications. Studies have shown that poor usability leads to increased user errors, longer task completion times, and lower user satisfaction, ultimately reducing user trust in digital banking systems [12][13]. In contrast, well-designed user interfaces improve perceived ease of use and perceived usefulness, which are core constructs in the Technology Acceptance Model (TAM) [14]. Mobile banking applications present unique usability challenges due to limited screen size, complex transaction workflows, and security requirements [15]. Therefore, systematic usability evaluation methods are required to ensure that applications remain user-centered while maintaining functional reliability.

Heuristic evaluation is a usability inspection method in which evaluators assess an interface based on a set of recognized usability principles or heuristics [9]. Nielsen's ten usability heuristics—such as visibility of system status, match between system and real world, user control and freedom, consistency and standards, and error prevention—have been extensively applied in evaluating web and mobile applications [10][16]. Previous studies have confirmed that heuristic evaluation is effective in identifying usability issues at an early stage and requires fewer resources compared to user testing methods [17]. In the context of mobile banking, heuristic evaluation has been successfully used to detect interface weaknesses related to navigation clarity, feedback mechanisms, and error recovery [18][19].

Several studies have applied heuristic evaluation to mobile banking applications. A study by [18] developed a heuristic-based usability evaluation model for mobile banking and demonstrated its effectiveness in improving interaction quality. Research by [19] applied heuristic principles to evaluate mobile banking interfaces for elderly users, revealing accessibility limitations despite overall usability strengths. In Indonesia, a usability study on BCA Mobile showed that user satisfaction decreased with increasing age, highlighting inclusivity issues in interface design [20]. However, most existing studies focus on external or general users. Limited research has examined mobile banking usability from the perspective of internal users, who possess higher system familiarity and operational insight. This study addresses this research gap by evaluating the KBStar application using internal employees as respondents, thereby providing deeper insights into usability issues related to real operational workflows.

III. RESEARCH METHOD

A. Research Stages

This study was conducted through a series of systematic and interrelated stages designed to ensure methodological rigor in evaluating the usability of the KBStar mobile banking application. Each stage was arranged sequentially to form a coherent methodological flow, starting from problem formulation and ending with the generation of practical recommendations. The detailed research stages are described as follows.

1. Problem Identification

The initial stage focused on identifying usability-related problems within the KBStar mobile banking application. This process was carried out by observing user interaction patterns and reviewing preliminary feedback from internal users regarding interface complexity, navigation clarity, and task efficiency. The identified problems served as the foundation for defining the scope of the study and determining the most relevant usability aspects to be evaluated using a heuristic-based approach.

2. Literature Review

At this stage, an extensive review of relevant literature was conducted to establish a strong theoretical foundation for the research. Previous studies related to mobile banking usability, heuristic evaluation methods, and user interface assessment were examined to identify commonly used evaluation criteria and methodological best practices. The literature review also helped to highlight the research gap, particularly the dominance of studies focusing on general users rather than internal users, thereby justifying the novelty and relevance of the present study.

3. Needs Analysis

The needs analysis stage aimed to determine the specific usability criteria and data requirements for evaluating the KBStar application. Nielsen's ten usability heuristics were selected as the primary evaluation framework, as they comprehensively cover critical usability aspects such as visibility of system status, user control and freedom, consistency and standards, error prevention, and help and documentation [21]. This stage ensured that the evaluation criteria were both theoretically grounded and practically applicable to the mobile banking context.

4. Questionnaire Design

Based on the selected heuristic principles, a structured questionnaire was developed to capture users' perceptions of the KBStar application's usability. Each heuristic was translated into multiple measurable statement items to ensure adequate representation of all usability dimensions. The questionnaire design process emphasized clarity, relevance, and neutrality of wording to minimize respondent bias and to ensure that the collected data accurately reflected actual user experiences. Blueprint of the Questionnaire is presented in Table 1.

5. Questionnaire Distribution

The validated questionnaire was distributed to selected respondents through an online platform using Microsoft Forms. This distribution method was chosen to facilitate ease of access, efficient data collection, and broader respondent participation within the internal user environment of Bank KB Bukopin. Respondents were given sufficient time to complete the questionnaire to ensure thoughtful and accurate responses.

6. Data Analysis

The collected data were analyzed using both descriptive and inferential statistical techniques. Prior to usability interpretation, instrument quality was assessed through validity and reliability testing to ensure the robustness of the questionnaire. Subsequently, usability scores were calculated using a Likert-scale scoring model and classified into predefined feasibility categories to systematically evaluate the overall usability level of the KBStar application.

7. Conclusion and Recommendations

The final stage involved synthesizing the analysis results to draw meaningful conclusions regarding the usability performance of the KBStar mobile banking application. Based on the identified usability strengths and weaknesses, practical recommendations were formulated to guide interface improvements and enhance user experience. This stage also provided insights for future research, particularly in extending usability evaluations to different user groups or integrating complementary evaluation methods.

TABLE I
QUESTIONNAIRE BLUEPRINT BASED ON NIELSEN'S HEURISTIC PRINCIPLES

Heuristic Aspect	Indicator	Sample Statement Item
Visibility of System Status	System feedback clarity	The application clearly displays transaction progress status
Match Between System and Real World	Terminology familiarity	The terms used in the application are easy to understand
User Control and Freedom	Navigation control	Users can easily undo or cancel actions
Consistency and Standards	Interface uniformity	Interface elements are consistent across menus
Error Prevention	Input validation	The system prevents errors before submission
Recognition Rather Than Recall	Memory load	The application minimizes the need to remember information
Flexibility and Efficiency of Use	Task efficiency	Frequently used features are easily accessible
Aesthetic and Minimalist Design	Visual simplicity	The interface layout is clean and uncluttered
Error Recognition and Recovery	Error messages	Error messages are clear and helpful
Help and Documentation	User assistance	Help features are easy to find and understand

B. Population and Sample

The population of this study comprised all internal employees of Bank KB Bukopin who were active users of the KBStar mobile banking application. At the time of the study, the total population consisted of 2,587 individuals. Internal employees were selected as the population of interest because they interact with the application not only as end users but also as stakeholders who understand operational workflows, business processes, and system constraints. This dual perspective allows for a more objective and in-depth usability evaluation compared to general users, particularly in identifying interface inefficiencies and functional limitations.

The determination of the sample size was based on the study [20][21][22] sampling table, which is widely used to ensure statistical representativeness in survey-based research. According to this method, a minimum sample size of 331 respondents was required to adequately represent the population and to ensure sufficient statistical power for analysis. This approach helps minimize sampling error while maintaining feasibility in data collection. A purposive sampling technique was employed to ensure that only respondents with relevant experience and adequate exposure to the KBStar application participated in the study. The inclusion criteria were defined as follows: respondents must be internal employees of Bank KB Bukopin, respondents must be active users of the KBStar application and respondents must have used the application within the last month.

These criteria were established to ensure that respondents possessed up-to-date knowledge of the application's interface and functionality. By focusing on recent users, the study aimed to capture accurate and reliable evaluations that reflect the current state of the KBStar application.

C. Data Collection Technique

Primary data in this study were collected using a structured questionnaire designed to evaluate the usability of the KBStar mobile banking application based on Nielsen's heuristic principles [23]. The questionnaire consisted of 33 statement items that represent ten heuristic aspects, with each item formulated to capture specific user perceptions related to interface clarity, control, consistency, and error handling [24]. The quality of user interface aspects was measured using a combination of Heuristic Evaluation and the Likert Scale. The resulting quality factor scores were then converted into percentages (%). The percentage value was calculated using the following formula [25].

$$Percentage = \frac{Obtained\ Score}{Maximum\ Score} \times 100\%$$

The calculated percentages were subsequently used to assess the feasibility of the evaluated aspects. According to [25], the interpretation is based on a five-level scale ranging from 0% to 100%, where 0% represents the lowest level and 100% indicates the highest level of feasibility. The percentage results obtained from respondents were then interpreted to determine the usability level of the KBStar Bank KB Bukopin application. Following the calculation, each percentage value was categorized to provide a clear assessment of the application's feasibility [25]. The interpretation criteria used in this study are presented in Table 2.

TABLE II
FEASIBILITY CATEGORIES

Category	Percentage Range
Very Good	81% – 100%
Good	61% – 80%
Fair	41% – 60%
Poor	21% – 40%
Very Poor	0% – 20%

IV. RESULTS AND DISCUSSION

A. Validity and Reliability Test

The research instrument used in this study was a structured questionnaire consisting of 33 statement items derived from Nielsen's ten usability heuristic principles. Prior to conducting the heuristic evaluation, the instrument was first assessed to ensure its validity and reliability, thereby confirming that the collected data accurately represent the usability aspects being measured. The validity test was performed using the Pearson Product Moment correlation method, which measures the correlation between each questionnaire item and the overall usability construct. The results showed that all items obtained correlation coefficients above the minimum threshold of 0.30, indicating that each item is valid and capable of measuring the intended heuristic aspect.

TABLE III
RESPONDENTS' ANSWERS TO USABILITY QUESTIONNAIRE STATEMENTS

No	Heuristic Evaluation Aspects	Statement	Answer				
			Strongly agree	Agree	Netral	Diagree	Strongly Disagree
1	<i>Visibility of system status</i>	X1_1	88	161	71	6	7
2		X1_2	86	163	71	9	4
3		X1_3	84	177	61	6	5
4		X1_4	94	170	62	5	2
5	<i>Match between system and the real world</i>	X2_1	87	156	77	9	4
6		X2_2	88	172	70	1	2
7		X2_3	98	158	68	5	4
8	<i>User control and freedom</i>	X3_1	79	151	81	18	4
9		X3_2	92	158	71	8	4
10		X3_3	89	171	63	6	4
11	<i>Consistency and standards</i>	X4_1	85	173	65	8	2
12		X4_2	88	157	76	10	2
13		X4_3	79	163	79	9	3
14		X4_4	81	165	73	11	3
15	<i>Error prevention</i>	X5_1	83	146	90	12	2
16		X5_2	92	150	76	11	4
17		X5_3	94	154	70	12	3

No	Heuristic Evaluation Aspects	Statement	Answer				
			Strongly agree	Agree	Netral	Disagree	Strongly Disagree
18	Recognition rather than recall	X6_1	79	161	84	7	2
19		X6_2	89	160	68	13	3
20		X6_3	89	168	59	13	4
21	Flexibility and efficiency of use	X7_1	105	147	65	13	3
22		X7_2	101	163	58	9	2
23		X7_3	76	174	69	8	3
24	Aesthetic and minimalist design	X7_4	82	168	64	13	6
26		X8_2	101	149	70	10	3
27		X8_3	99	155	68	9	2
28		X8_4	89	158	72	13	1
29	Help user recognize, diagnose and recover from errors	X9_1	87	155	72	15	4
30		X9_2	87	145	79	18	4
31		X9_3	86	160	74	10	3
32	Help and documentation	X10_1	95	148	79	10	1
33		X10_2	89	146	85	11	2
Total			2938	5265	2357	325	104

Furthermore, the reliability of the instrument was evaluated using Cronbach's Alpha to determine the consistency of responses across all items. The analysis yielded a Cronbach's Alpha value of 0.963, which exceeds the standard threshold of 0.70, indicating a high level of internal consistency. This demonstrates that the questionnaire items consistently measure the same usability dimensions. Based on these results, the instrument is considered both valid and reliable, and therefore suitable for further analysis. This ensures that the subsequent heuristic evaluation results, including the calculation of percentage scores and their categorization into usability levels, are based on accurate and consistent measurement data.

B. Heuristic Evaluation Result

The usability of the KBStar mobile banking application was further examined using Nielsen's ten usability heuristics as the primary evaluation framework. Each heuristic principle was assessed through multiple questionnaire items to ensure comprehensive coverage of key usability dimensions, including system visibility, user control, consistency, error prevention, and help and documentation. The results of this heuristic-based evaluation provide detailed insights into the strengths and weaknesses of the application's user interface. by using equation 6 the average results of the heuristic aspects are obtained.

TABLE IV
HEURISTIC EVALUATION RESULTS

Heuristic Aspect	Nilai (%)	Category
Visibility of System Status	79,71 %	Good
Match Between System and the Real World	79,96 %	Good
User Control and Freedom	78,90 %	Good
Consistency and Standards	79,01 %	Good

Heuristic Aspect	Nilai (%)	Category
Error Prevention	78,72 %	Good
Recognition Rather Than Recall	79,06 %	Good
Flexibility and Efficiency of Use	79,74 %	Good
Aesthetic and Minimalist Design	80,06 %	Good
Help Users Recognize, Diagnose, and Recover	78,32 %	Good
Help and Documentation	79,07 %	Good

The results indicate that all ten usability heuristic aspects are classified within the “Very Good, Good, Fair, Poor and Very Poor” category, reflecting a generally positive evaluation of the KBStar mobile banking application. A deeper analysis indicates that the relatively lower score in the Help and Documentation aspect suggests insufficient guidance for users when encountering difficulties. This may be caused by limited onboarding instructions or lack of contextual help features. Similarly, the Error Prevention aspect scored lower compared to interface-related heuristics, indicating that while the visual design is strong, the system may not adequately prevent user input errors or provide proactive validation mechanisms. On the other hand, high scores in Aesthetic Design and Visibility of System Status suggest that the application prioritizes visual clarity and feedback responsiveness, which are critical in financial applications. Among these aspects, *Visibility of System Status* achieved the highest rating, followed closely by *Flexibility and Efficiency of Use* and *Aesthetic and Minimalist Design*. These findings suggest that the application effectively provides clear and timely system feedback, supports efficient user interactions, and presents interface elements that are visually simple while remaining functionally adequate.

TABLE V
USABILITY ISSUES AND SEVERITY RATING

Issue	Description	Severity
Error message unclear	Users confused during failed transfer	Major
Navigation inconsistency	Different menu structure	Minor
Lack of undo	Cannot cancel transaction easily	Major
Hidden help feature	Help menu hard to find	Modarate

Further analysis of the questionnaire responses demonstrates that the overall usability level of the KBStar application satisfies the established feasibility criteria. The high validity and reliability of the measurement instrument indicate that the questionnaire is capable of accurately capturing users’ perceptions of usability. The evaluation results also reveal that internal users perceive the KBStar application as intuitive, visually coherent, and consistent in terms of its design elements and interaction patterns. Notably, none of the heuristic components received low scores or indicated critical usability issues, implying that the application has successfully implemented fundamental principles of user-centered interface design.

Nevertheless, despite the favorable usability outcomes, the findings also highlight opportunities for further enhancement. Continuous improvements, particularly in areas related to help features, documentation clarity, and accessibility, may contribute to a more inclusive and robust user experience. Such improvements are especially relevant as the application evolves and potentially accommodates a broader and more diverse user base, ensuring sustained usability performance over time.

C. Interface Application

To support the usability evaluation findings, several key interface components of the KBStar mobile banking application are presented as visual evidence. These interface screenshots provide contextual insight into how users interact with the system and help illustrate specific usability strengths and potential issues identified during the analysis. Figure 1 presents the main dashboard interface of the KBStar application. The dashboard serves as the primary entry point for users, displaying essential information such as account balance, quick access menus, and frequently used features. The layout appears visually structured and relatively clean, supporting the heuristic principle of aesthetic and minimalist design. Additionally, the presence of clearly labeled icons and grouped functionalities contributes to improved visibility of system status and ease of navigation. However, minor inconsistencies in icon labeling and feature grouping may affect user familiarity, particularly for first-time users.

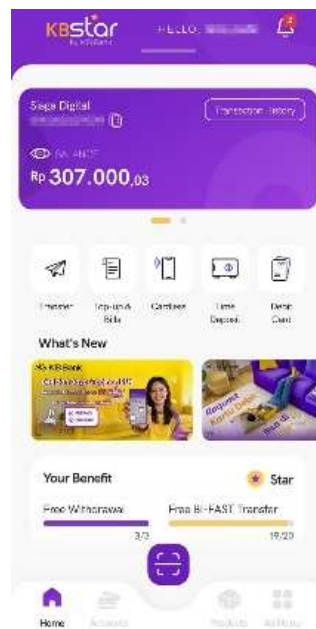


Figure 1. KBStar Application Dashboard Interface

Figure 2 illustrates the transaction page interface, where users perform financial operations such as transfers and payments. This interface reflects the application's approach to task execution and user flow. The step-by-step structure supports usability in terms of visibility of system status and recognition rather than recall, as users are guided through the transaction process. Nevertheless, the evaluation identified limitations in user control and freedom, particularly in scenarios where users need to revise or cancel transactions. The absence of clear undo or backtracking options may increase the risk of user errors.

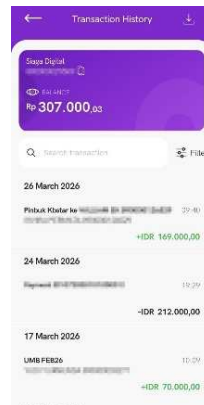


Figure 2. Transaction Page Interface

Figure 3 shows an example of an error message displayed during a failed transaction. This figure is particularly important in evaluating the error recognition and recovery heuristic. While the system provides feedback when an error occurs, the message lacks sufficient detail and actionable guidance. Users may find it difficult to understand the exact cause of the issue or the steps required to resolve it. This observation aligns with the relatively lower score obtained in the Help and Documentation and Error Prevention aspects, indicating the need for more informative and user-friendly error handling mechanisms.

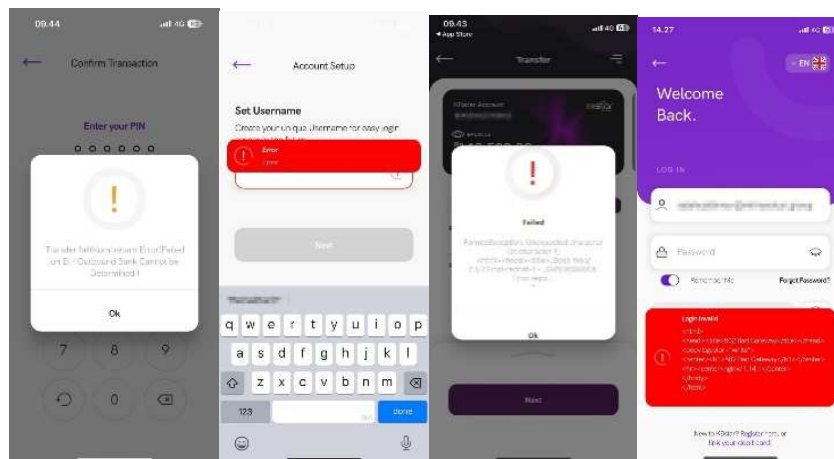


Figure 3. Error Message Example

V. CONCLUSION

Based on the results of the heuristic evaluation, the KBStar mobile banking application demonstrates a consistently positive usability performance across all evaluated aspects. All ten heuristic principles achieved scores within the “Good” category, indicating that the application has successfully met fundamental usability standards in terms of user interface design and interaction quality. The findings show that key aspects such as Visibility of System Status, Flexibility and Efficiency of Use, and Aesthetic and Minimalist Design obtained relatively higher scores, suggesting that the application provides clear system feedback, supports efficient task execution, and presents a visually structured interface. These strengths are essential in enhancing user experience, particularly in the context of mobile banking applications that require clarity, speed, and reliability.

However, despite the overall positive evaluation, several aspects such as Error Prevention, Help Users Recognize, Diagnose, and Recover from Errors, and Help and Documentation received comparatively lower scores. This indicates that while the interface is visually strong and functionally adequate, there are still limitations in terms of user guidance, error handling, and preventive system mechanisms. These areas require further improvement to ensure a more comprehensive and user-centered experience. Overall, the KBStar application can be considered usable and well-designed, particularly for internal users who are familiar with the system. Nevertheless, continuous enhancement is recommended, especially in improving help features, error messages, and user control mechanisms. Future research is also suggested to incorporate expert-based heuristic evaluation and task-based usability testing to provide more objective and in-depth usability insights.

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