The Lean User Experience (Lean UX) Approach in the Redesign of the SOBAT BPS Application

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Abstract. SOBAT BPS is a service provided by BPS to be used by partners and prospective partners of BPS throughout Indonesia. Alongside the utilization of the SOBAT BPS application, user reviews and assessments become significant elements in measuring the quality and success of this application. Feedback obtained from these assessments indicates that a redesign of the SOBAT BPS application is necessary to provide a better user experience. Prior to redesigning the SOBAT BPS application, a preliminary survey was conducted to understand user perceptions of the current system using heuristic evaluation and the user experience questionnaire (UEQ). Based on the preliminary survey results, there are issues related to the implementation of heuristic principles in the SOBAT BPS application, and only the UEQ stimulation scale received a good ranking. Therefore, the aim of this research is to redesign the SOBAT BPS application using the Lean UX method and to evaluate the redesigned results using heuristic evaluation and UEQ. The evaluation results of the redesigned SOBAT BPS application indicate that the redesign is superior to the current SOBAT BPS application.

1. Introduction

In supporting statistical activities, especially the implementation of censuses and surveys in a region, BPS recruits statistical partners who meet specific qualifications. Statistical partners are distinct from government contract employees (PPPK), making them freelance or independent [1]. SOBAT BPS, is a service provided by BPS for partners and prospective partners throughout Indonesia to participate in statistical activities organized by BPS [2].

SOBAT BPS plays a significant role in BPS's business process as a platform for recruiting census and survey personnel. Through the use of SOBAT BPS, prospective partners can access information about available partner positions and receive updates throughout the recruitment process. This application is available in web version accessible via https://mitra.bps.go.id and a mobile version that can be downloaded from the Play Store. This research only focuses on the mobile version of the SOBAT BPS application.

The SOBAT BPS application can be downloaded for devices with a minimum Android 5.0 specification. As of January 31, 2023, the SOBAT BPS application has been downloaded more than 500,000 times and received a rating of 3.6/5 from 840 reviews. With the usage of the SOBAT BPS application, user reviews and ratings on the Play Store become significant elements in measuring the quality and success of the application. Some user review points include unresponsiveness, blank pages, lack of a password recovery feature, bugs in the personnel card, and email activation that didn't go

through. Feedback obtained from these assessments indicates the need for a redesign of the SOBAT BPS application to provide a better user experience.

Before conducting the redesign, the researcher conducted a preliminary survey to gain in-depth understanding and initial information about the current system. This preliminary survey served as an initial evaluation, focusing on user needs for the future system. The questionnaire included sections about identity, partner registration platforms, system evaluation, satisfaction levels, and areas that need development or addition from the current system. The evaluation framework used in the system evaluation questionnaire was heuristic evaluation [3] and the user experience questionnaire (UEQ) [4].

Based on the preliminary survey results, only 1.56 percent of respondents used other platforms to register as BPS partners. This platform was the form provided by the local BPS staff. This small percentage indicates that SOBAT BPS has the potential to become an effective partner recruitment gateway. With SOBAT BPS serving as a single recruitment gateway, BPS can optimize the efficiency of the partner recruitment process, reduce the time-consuming manual methods, and enhance accessibility and transparency for prospective partners in the recruitment process. In the preliminary survey using heuristic evaluation, experts assessed the alignment between heuristic principles and their application in the SOBAT BPS application. Assessments were made based on severity ratings ranging from 0 to 4. The use of severity ratings aids in categorizing heuristic-related issues, enabling researchers to prioritize improvements.

Table 1. Average severity rating results of SOBAT BPS application

Heuristic Principles	Code	Average Severity Rating	Category
Visibility of system status	H1	0,67	Cosmetic
Match between system and the real world	H2	0,67	Cosmetic
User control and freedom	H3	0,00	Cosmetic
Consistency and standards	H4	1,67	Minor
Error prevention	H5	0,33	Cosmetic
Recognition rather than recall	H6	0,33	Cosmetic
Flexibility and efficiency of use	H7	1,33	Cosmetic
Aesthetic and minimalist design	H8	2,67	Major
Help users recognize, diagnose, and recover from errors	H9	1,67	Minor
Help and documentation	H10	1,33	Cosmetic

Heuristic evaluation in the preliminary survey was carried out by three experts working as UI/UX designers. These experts assessed the severity level of issues related to the alignment between heuristic principles and their implementation in the SOBAT BPS application. As depicted in Table 1, problems associated with consistency and standards and help users recognize, diagnose, and recover from errors were categorized as minor, while the aesthetic and minimalist design principle fell under the major category. The minor category represents issues with low priority for rectification, whereas the major category denotes issues of high priority for improvement. Meanwhile, the other principles were classified as cosmetic, indicating that they do not require immediate fixing unless there is available time for improvement.

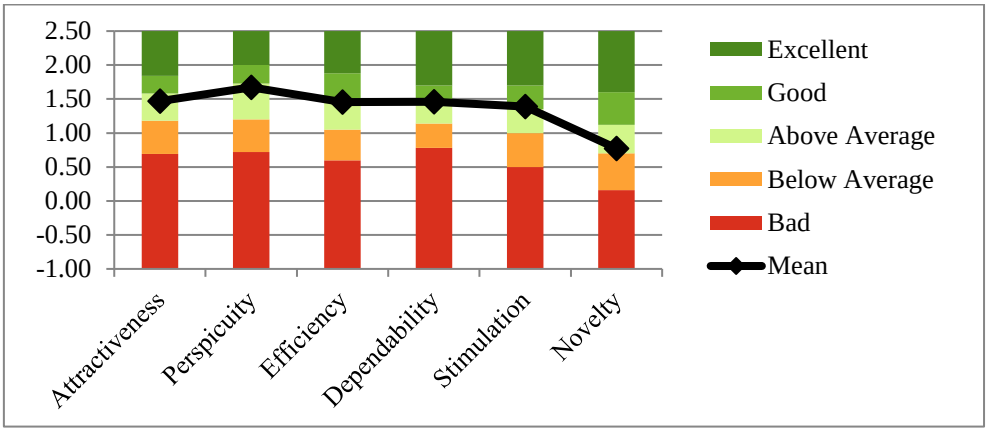

Figure 1. UEQ Benchmark Diagram for SOBAT BPS Application

The preliminary survey employed the UEQ questionnaire, which was completed by 64 respondents who are users of SOBAT BPS. As depicted in Figure 1, only the stimulation scale received a favourable rating, while the other five scales - attractiveness, perspicuity, efficiency, dependability, and novelty - were only above average. The novelty scale received the lowest average score, 0.773, making it a priority for improvement. The novelty scale includes items like creative/monotonous, imaginative/conventional, common/leading-edge, and conservative/innovative [5]. The calculated mean UEQ results can be observed in Table 2.

Table 2. UEQ results of SOBAT BPS application

Scale	Mean
Attractiveness	1,469
Perspicuity	1,672
Efficiency	1,453
Dependability	1,461
Stimulation	1,391
Novelty	0,773

Based on the preliminary survey results, there were identified major, minor, and cosmetic issues related to the heuristic principles within the SOBAT BPS application. Additionally, the ratings for the scales of attractiveness, perspicuity, efficiency, dependability, and novelty in the SOBAT BPS application have not yet reached a satisfactory level. Hence, a redesign of the SOBAT BPS application is necessary to enhance the UEQ scale ratings based on heuristic principles.

For this redesign, the study adopts the Lean User Experience (Lean UX) methodology. This method is built upon the foundation of design thinking and mirrors the agile development's rapid and iterative nature, ensuring that the generated data is utilized in every iteration [6]. The choice of Lean UX is influenced by its resemblance to User-Centered Design (UCD) [7]. The advantages of this approach include resource efficiency, user-centricity, and reliance on data-driven insights to inform decisions.

2. Methodology

The method used in this research is Lean User Experience (Lean UX). The Lean UX process is illustrated in Figure 2.

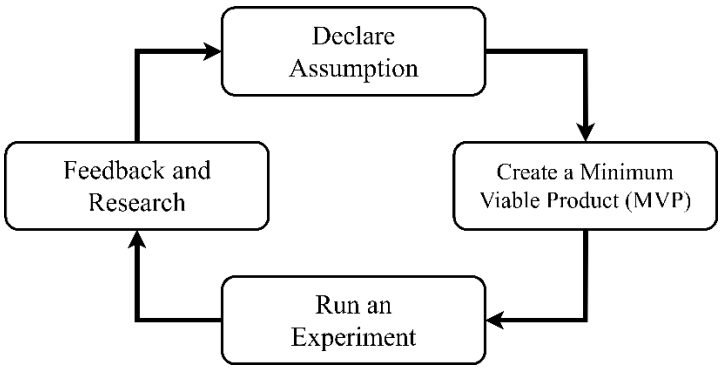

Figure 2. Lean UX process [6]

2.1. Lean User Experience (Lean UX)

Lean UX is a collaborative design approach centered on the user, with a focus on minimizing time, costs, and resources wasted during the design cycle [8]. The primary goal of Lean UX is to gather feedback as early as possible, enabling swift decision-making [9]. The Lean UX method comprises four stages: declaring assumption, creating a minimum viable product (MVP), running an experiment, and obtaining feedback and research [6].

The declaration of assumptions involves formulating problem statements, filling out an assumptions worksheet, prioritizing assumptions, creating hypotheses, proto-personas, and collaborative design [6].

The second stage is creating a viable minimum product (MVP). MVP aids in testing assumptions without wasting effort on unproven ideas [6]. One of the most effective ways to create an MVP is through prototyping. In this research, coded prototypes were designed.

The next stage is run an experiment. This is done by testing the MVP prototype, performed by developers and stakeholders. This phase ensures that the designed MVP works effectively before user testing. The final stage is feedback and research. In this phase, the MVP is tested with users using heuristic evaluations and UEQ. This step aims to validate hypotheses based on user feedback. The obtained feedback will be processed for improving the MVP. In Lean UX, heuristic evaluations can be conducted to understand existing usability problems or challenges within the application. UEQ is a tool used to measure user experience by gathering feedback from users. It helps assess various aspects of the user experience, such as attractiveness, clarity, efficiency, and novelty. By collecting this feedback, researcher can understand how users perceive the application. In Lean UX, continuous feedback from both experts and users is essential. In the context of the SOBAT BPS application, heuristic evaluation helps identify major and minor usability issues, while UEQ provides insights into how users perceive the application's user experience. This information is invaluable for Lean UX because it guides the design and development process.

2.2. Heuristic Evaluation

Heuristic evaluation involves a small number of expert evaluators examining the interface and assessing its adherence to heuristic principles. The minimum competence for expert evaluators in this study is to have at least 2 years of experience in the field of UI/UX design, which can be proven with UI/UX design portfolios. The recommended number of evaluators is 3-5 [10]. There are 10 heuristic principles, as follows [11].

1. Visibility of system status
2. Match between system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use

8. Aesthetic and minimalist design
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation

Usability issues encountered might not be quick and inexpensive to fix, so a severity rating can be used to allocate resources for major issues [12]. The severity rating scale ranges from 0 to 4. [13]. Research [14] categorizes the severity of encountered problems based on severity ratings (SR) into four categories. SR $\geq$ 3.5 is considered catastrophic, indicating a very high severity issue that requires immediate fixing before product release. The range 2.5 $\leq$ SR $\leq$ 3.5 is considered major, indicating significant severity issues that are a high priority for fixing. The range 1.5 $\leq$ SR $\leq$ 2.5 is considered minor, which is a low-priority issue. Lastly, SR < 1.5 is considered cosmetic, indicating very low severity issues that require fixing only if extra time is available.

2.3. User Experience Questionnaire (UEQ)

User Experience Questionnaire (UEQ) is an easily applicable, reliable, and valid questionnaire to measure user experience [15]. The main goal of UEQ is to measure UX directly and quickly, focusing on users' spontaneous reactions and impressions of the product. UEQ aids in efficient and time-saving testing. UEQ measures six user experience scales divided into 26 characteristic items, each representing a scale. Characteristic items are in the form of semantic differentials, two opposing words or phrases [5]. The following are the six measurement scales in UEQ [5].

1. Attractiveness
   Overall impression of the product's attractiveness to users.
2. Perspicuity
   Measures how easily users can understand and learn to use the product.
3. Efficiency
   Measures how quickly and efficiently the product helps users complete tasks.
4. Dependability
   Measures the user's perceived control over interactions.
5. Stimulation
   Measures how appealing the product is and how much motivation it provides for use.
6. Novelty
   Measures the product's innovativeness and creativity.

3. Results

The initial survey results offer significant insights into the usability features of the SOBAT BPS application. The survey identified notable usability problems related to heuristic principles, ranging from major to minor issues. Furthermore, the rankings of scales like attractiveness, perspicuity, efficiency, dependability, and novelty within the User Experience Questionnaire (UEQ) suggest that the current state of the SOBAT BPS application does not provide a satisfactory user experience. Consequently, a redesign of the application is warranted to improve these UEQ scales, guided by heuristic design principles.

3.1. Declare Assumption

3.1.1. Problem Statement. The formulation of problem statements is based on the previously obtained data collection results. There are three focal problem statements collected by the researcher, covering UI, UX, and features of the SOBAT BPS application.

1. The SOBAT BPS application is designed for BPS partners and potential partners. Currently, users perceive the application's UI is simple, but its appearance is monotonous and lacks appeal. How can the UI of the SOBAT BPS application be designed to be more attractive to its users?
2. The SOBAT BPS application is created to facilitate BPS partners and potential partners in participating in BPS surveys/censuses. Presently, users find inconsistencies that confuse them

while using the application. How can the UX of the SOBAT BPS application be designed so that users find it easy and enjoyable to operate?

3. The current version of the SOBAT BPS application is not optimally based on mobile platforms. Users believe that there are many additional features that could be developed, similar to common mobile applications. How can the features of the SOBAT BPS application be designed to fulfill user needs effectively?

3.1.2. Assumptions Worksheet. Filling out the assumption worksheet refers to the results of the initial evaluation of the SOBAT BPS application. The next step involves filling out the assumptions worksheet as shown in Table 3.

Table 3. List of assumptions

Code	Assumption
AS1	It is assumed that users require the optimization of application features that still contain bugs, especially on the officer card. This need can be met by regular debugging. The potential risk is that users might feel uncomfortable due to frequent version updates.
AS2	It is assumed that users need a minimal-sized application to conserve storage space. This need can be fulfilled by minimizing the number and size of resources used. The potential risk is the loss of necessary information.
AS3	It is assumed that users desire faster and more practical application processing, especially during peak usage times. This need can be met by improving server performance. The potential risk is increased costs and security vulnerabilities.
AS4	It is assumed that users want an attractive app design that is not constrained by default templates. This need can be fulfilled by understanding the app's main focus and arranging layouts, colors, and size compositions appropriately. The potential risk is that inexperienced users might find it challenging to use SOBAT BPS due to a need for adaptation.
AS5	It is assumed that users require timely information updates in the app, eliminating the need to open it for the latest information. This need can be met by adding notification features. The potential risk is that users might perceive the notifications as excessive and become annoyed.
AS6	It is assumed that users want to provide feedback and suggestions for completed activities. This need can be fulfilled by incorporating a feedback feature, enhancing the quality of future activities. The potential risk is that this feedback feature might not be optimally used due to the close proximity of activities.
AS7	It is assumed that users need information about the amount of completed work. This need can be met by integrating tasks and the app, allowing SOBAT BPS to display the progress of ongoing partner activities. The potential risk is that the integration process might be time-consuming.
AS8	It is assumed that users need information about the reasons for not being accepted in surveys/censuses they participated in. This need can be fulfilled by displaying reasons for non-acceptance in the survey/census the user registered for. The potential risk is that the reasons provided might be sensitive and hurt users' feelings.
AS9	It is assumed that users require application consistency. This need can be met by maintaining consistency in icon usage, fonts, language, mobile-

Code	Assumption
	based pages, and other design materials. The potential risk is that users might not be familiar with the changes made.
AS10	It is assumed that users need relevant and easily understandable information and instructions. This need can be met by providing user guides, using straightforward language, and offering error solutions. The potential risk is that users might struggle to understand the language and intent of the provided information or instructions.
AS11	It is assumed that users need to ensure the accuracy of the data they provide. This need can be met by creating a system that verifies user data. The potential risk is that the system might still allow incorrect or dummy data to pass through.

3.1.3. Prioritizing Assumptions. The next step involves prioritizing assumptions based on potential risks and research limitations. The research limitations encompass redesigning only the frontend aspects of the SOBAT BPS application, specifically focusing on UI and UX. Consequently, the redesign of the SOBAT BPS application concentrates solely on the top-ranked assumptions, namely Assumption 10, Assumption 9, Assumption 4, Assumption 5, and Assumption 6. The remaining six assumptions could not be fully explored within this study. Detailed priority rankings of the assumptions are presented in Table 4.

Table 4. List of assumptions

Rank	Code	Main Assumption Points
1	AS10	Relevant and Easily Understandable Information and Instructions
2	AS9	Application Consistency
3	AS4	Attractive User Interface
4	AS5	Notifications
5	AS6	Feedback and Suggestions
6	AS8	Reasons for Registration Rejection
7	AS11	Data Verification
8	AS1	Optimization of Features with Existing Bugs
9	AS3	Fast and Practical Processing
10	AS7	Work Progress Tracking
11	AS2	Minimal Application Size

3.1.4. Hypotheses. The hypothesis in this study is: "It is believed that redesigning the SOBAT BPS application, which includes user needs for UI and UX aspects, makes the SOBAT BPS application more attractive and user-friendly. This is considered true if the evaluation results of heuristic principles and UEQ for the designed solution show improvements compared to the existing SOBAT BPS application."

3.1.5. Proto-persona. Proto-personas are created by referring to the results of the preliminary survey conducted among SOBAT BPS users. The selection of personas takes into account the completeness of respondent answers during the preliminary survey. In this study, the research focus is solely on the frontend aspect of the application, thus backend-related needs such as system integration and error minimization are not covered. The outcomes of the proto-personas can be observed in Figure 3.

 **Q1 – Sketch and name** - Mohammad Fauzan Nabil - BPS Partner	**Q2 – Behavioral demographic information** - Man - 22 years old - Bogor Regency - Student
Q3 – Pain points and needs - Application UI that is not monotonous. - Clear information on the SOBAT BPS application. - Integrated SOBAT BPS website and application. - Fixed bug on officer cards.	**Q4 – Potential solutions** - UI redesign to make it more attractive. - Use consistent language and sentences that are easy to understand so that information can be conveyed well. - Integrate the SOBAT BPS website and application - Carrying out regular repairs or debugging.

Figure 3. Proto-persona

3.1.6. Collaborative Design

In this phase, the researcher creates a design studio through the process of sketching and developing a style guide. Figure 4 is the sketch of the login and homepage.

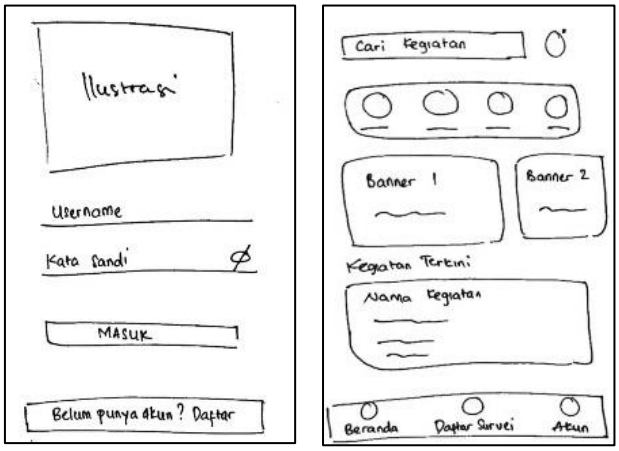

Figure 4. Sketches of the login (left) and homepage (right)

The changes in login page include the addition of an illustration above the username or email text field. This addition of illustration follows the application of the aesthetic and minimalist design heuristic principle. In general, the information that users need to fill in remains the same as the actual SOBAT BPS application. Meanwhile, the changes made to the homepage involve rearranging the submenu, banner, and adding the latest available activities.

While creating the style guide, the researcher introduces several changes while adhering to the UI standards used in the current SOBAT BPS application. The examined UI standards include colors, typography, icons, illustrations, and UI components as seen in Figure 5.

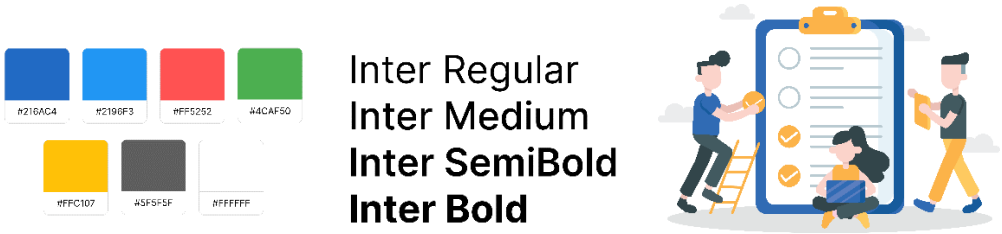

Figure 5. Style guide element

3.2. Create a Minimum Viable Product (MVP)

During this phase, the redesign of the SOBAT BPS application was carried out at a high-fidelity prototype level, in the form of a coded prototype. In creating the prototype for the redesigned SOBAT BPS application, the researcher referred to the previous developer's documentation, which utilized the Vue.js Javascript framework, the cross-platform Capacitor runtime, and the Vuetify UI framework. Figure 6 depicts the homepage of the SOBAT BPS application before and after the redesign. The complete prototype of the redesigned SOBAT BPS application can be accessed at https://s.stis.ac.id/SobatBPSRedesain.

Figure 6. The homepage of the SOBAT BPS application before (left) and after the redesign (right)

3.3. Run an Experiment

In this phase, a demonstration of the prototype of the redesigned SOBAT BPS application was conducted by the researcher along with the previous SOBAT BPS development team. Based on the outcomes of the discussion, it was identified that an improvement was necessary. Specifically, the change involved altering the existing "Pengalaman" submenu on the homepage to "Riwayat Daftar" submenu, as both terms refer to different sets of information. Therefore, these recommended improvements will be carried out in the next iteration.

3.4. Feedback and Research

3.4.1. Heuristic Evaluation. The heuristic evaluation of the redesigned SOBAT BPS application was conducted by the same three experts as in the preliminary survey. These experts assessed the severity level of alignment between heuristic principles and their implementation in the redesigned SOBAT BPS application.

Table 5. Average severity rating results of the redesigned application

Heuristic Principles	Code	Average Severity Rating	Category
Visibility of system status	H1	1,00	Cosmetic
Match between system and the real world	H2	0,00	Cosmetic
User control and freedom	H3	1,33	Cosmetic
Consistency and standards	H4	0,33	Cosmetic
Error prevention	H5	1,00	Cosmetic
Recognition rather than recall	H6	1,00	Cosmetic
Flexibility and efficiency of use	H7	0,00	Cosmetic
Aesthetic and minimalist design	H8	1,00	Cosmetic
Help users recognize, diagnose, and recover from errors	H9	0,00	Cosmetic
Help and documentation	H10	1,00	Cosmetic

Overall, the severity levels of issues related to heuristic principles in the redesigned SOBAT BPS application fell into the cosmetic category. This indicates a reduction in the severity level of issues, implying that the redesigned application performs better than the current version. As shown in Table 5, problems previously categorized as minor for the principles of consistency and standards and help users recognize, diagnose, and recover from errors shifted to the cosmetic category. Issues associated with the aesthetic and minimalist design principle, previously categorized as major, have been successfully addressed and now fall into the cosmetic category. However, some other principles like visibility of system status, user control and freedom, error prevention, and recognition rather than recall, received higher severity scores compared to the current SOBAT BPS application.

Among the three experts, one was highly satisfied with the results of the redesigned SOBAT BPS application, while the other two were moderately satisfied. The experts appreciated the simplicity, attractiveness, and consistent design of the redesign. According to them, improvements that could be made to the redesigned SOBAT BPS application include refining and clarifying the use of shadows and enhancing the application's flow.

3.4.2. User Experience Questionnaire (UEQ). In the UEQ evaluation, a total of 21 respondents provided assessments for the UEQ questionnaire items. In this evaluation, some of the respondents who participated as evaluators were also users of the SOBAT BPS application and had previously taken part in the preliminary survey.

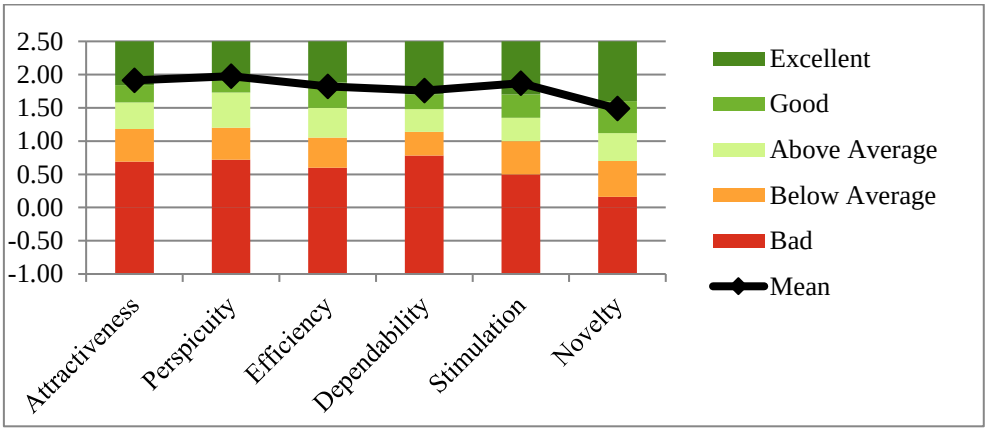

Figure 7. UEQ benchmark diagram for the redesigned SOBAT BPS application

Based on Figure 7, it is evident that there has been an improvement in each scale. The attractiveness, perspicuity, and stimulation scales have received very good ratings. Meanwhile, the dependability, efficiency, and novelty scales have achieved good ratings. The results of the average UEQ scale calculations can be observed in Table 6.

Table 6. Comparison of Average UEQ scale scores between the application and redesigned prototype

Scale	Mean	
	SOBAT BPS	Redesign
Attractiveness	1,469	1,913
Perspicuity	1,672	1,976
Efficiency	1,453	1,821
Dependability	1,461	1,762
Stimulation	1,391	1,869
Novelty	0,773	1,488

In Table 6, it is apparent that the average scores for each scale have increased. The novelty scale, which was a priority for improvement previously with a score of 0.773, has experienced an increase to 1.488. Aspects appreciated by users in the redesigned application include the appearance and notifications on the homepage, a simple and creative design, as well as an easily understandable application. Disliked aspects of the redesigned application include the slow loading process. Users expect future application iterations to provide more detailed history list information and to expedite the application loading process.

3.5. Second Iteration

Based on the evaluation of the redesign in the first iteration, the redesigned application received positive feedback both from experts and users overall. However, there were several improvement recommendations from experts regarding issues encountered in the redesign of the SOBAT BPS application. Drawing from the findings and recommendations, the researcher made a number of significant improvements to the redesign. In this second iteration, the researcher also detailed the design of several pages that were previously blank. The improvements encompassed enhancing more responsive feedback, providing confirmation dialogs, adding clear undo buttons, and enlarging the font size of the banner. Furthermore, enhancements were made to the transaction flow of survey registration. The history list page, which was previously part of a tab on the survey list page, was transformed into a standalone page.

3.5.1. Heuristic Evaluation. The heuristic evaluation of the redesigned SOBAT BPS application was conducted by the same three experts as in the preliminary survey and the first iteration.

Table 7. Comparison of average severity rating of the redesigned application in second iteration

Heuristic Principles	Code	Average Severity Rating			
		1st Iteration	Category	2nd Iteration	Category
Visibility of system status	H1	1,00	Cosmetic	0,00	Cosmetic
Match between system and the real world	H2	0,00	Cosmetic	0,00	Cosmetic
User control ands freedom	H3	1,33	Cosmetic	0,33	Cosmetic
Consistency and standards	H4	0,33	Cosmetic	0,67	Cosmetic
Error prevention	H5	1,00	Cosmetic	1,00	Cosmetic
Recognition rather than recall	H6	1,00	Cosmetic	0,00	Cosmetic
Flexibility and efficiency of use	H7	0,00	Cosmetic	0,00	Cosmetic
Aesthetic and minimalist design	H8	1,00	Cosmetic	0,67	Cosmetic
Help users recognize, diagnose, and recover from errors	H9	0,00	Cosmetic	2,00	Minor
Help and documentation	H10	1,00	Cosmetic	0,33	Cosmetic

In the first iteration, the principles of visibility of system status, user control and freedom, error prevention, and recognition rather than recall received higher severity ratings compared to the current SOBAT BPS application. After the necessary improvements were implemented, the severity ratings for these four principles decreased or improved from the first iteration. This indicates that the second iteration's redesign successfully addressed the issues related to these principles.

As observed in Table 7, only the principle "help users recognize, diagnose, and recover from errors" obtained a severity rating in the minor category, while the other principles fell into the cosmetic category. In the first iteration, this principle had a severity rating of 0.00, classifying it as cosmetic. Therefore, no changes or improvements were made to this principle in the second iteration. However, its severity rating increased to 2.00, placing it in the minor problem category. Issues identified by the experts regarding this principle included actions allowing users to proceed to the next step before completing all required inputs and inadequate error messages. The existence of inconsistencies in the expert evaluator's answers in the first iteration can occur due to several factors, including the possibility of forgetting previous answers. Expert evaluations that involve complex questions or require deep thinking can cause evaluators to forget their previously given answers.

Additionally, the principle of consistency and standards experienced an increase in severity rating, rising from 0.33 in the first iteration to 0.67. According to the experts, improvements that could be made in the subsequent redesign of the SOBAT BPS application involve enhancing error prevention actions in forms and changing page transitions through bottom navigation without requiring a complete application rebuild.

3.5.2. User Experience Questionnaire (UEQ). As seen in Figure 8, the average UEQ scale scores for the redesign of the application in the second iteration achieved very good results. The average scores for all scales increased when compared to the results of the first iteration. This improvement in the average UEQ scale scores indicates that the overall enhancements made have successfully elevated the assessed aspects, such as attractiveness, perspicuity, efficiency, dependability, stimulation, and novelty.

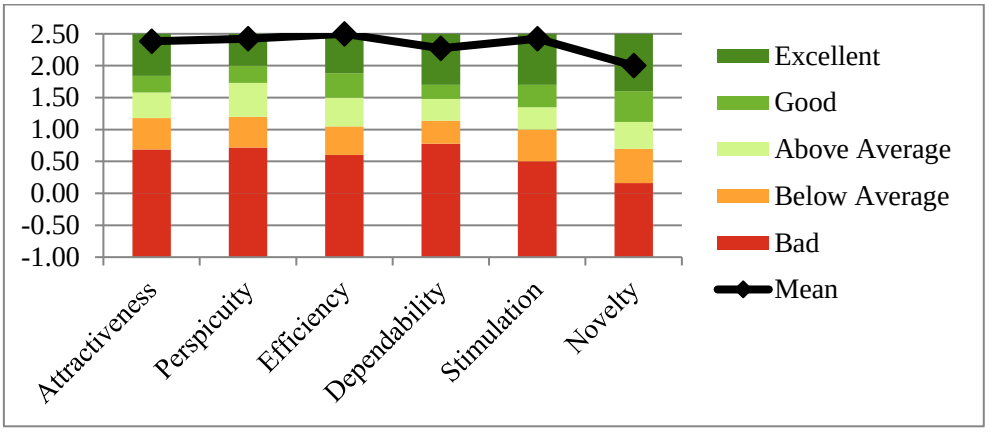

Figure 8. UEQ benchmark diagram for the redesigned SOBAT BPS application in second iteration

In Table 8, it can be observed that the average scores for each scale in the second iteration increased compared to both the first iteration and the current SOBAT BPS application. Users appreciated several aspects of the redesign in the second iteration, including the presence of shortcuts to the latest survey listings, easily understandable information, and an appealing design. Based on the findings from the second iteration evaluation, there were no aspects of the redesign application that the users disliked.

Table 8. Comparison of average UEQ scale ratings

Scale	Mean		
	SOBAT BPS	1st Iteration	2nd Iteration
Attractiveness	1,469	1,913	2,383
Perspicuity	1,672	1,976	2,425
Efficiency	1,453	1,821	2,500
Dependability	1,461	1,762	2,275
Stimulation	1,391	1,869	2,425
Novelty	0,773	1,488	2,000

4. Conclusion

Based on the conducted research, it can be concluded that this study successfully redesigned the SOBAT BPS application using the Lean UX method. The evaluation of the redesigned SOBAT BPS application through heuristic evaluation and UEQ yielded better scores compared to the current SOBAT BPS application. Thus, the research hypothesis stating that redesigning the SOBAT BPS application, which includes user needs for UI and UX aspects, makes the SOBAT BPS application more attractive and user-friendly has been proven true. The researcher recommends addressing issues related to consistency and standards, as well as improving the ability of users to recognize, diagnose, and recover from errors. These actions would further enhance the redesigned SOBAT BPS application. Moreover, for future research, it is suggested that the prototype be further developed, potentially involving backend aspects to enable its implementation in the actual SOBAT BPS application.

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