

USER EXPERIENCE USING THE PLANES METHOD ON THE BUKUERP APPLICATION

Bety Wulan Sari^{1*}, Donni Prabowo²

Fakultas Ilmu Komputer^{1,2}
Universitas AMIKOM Yogyakarta^{1,2}
bety@amikom.ac.id¹, donniprabowo@amikom.ac.id²
(*) Corresponding Author

Abstract

An enterprise resource planning (ERP) application known as bukuERP, designed to serve the finance, personnel, and transaction management departments, necessitates a user experience analysis to enhance overall usability and user satisfaction. This research mainly focuses on the organizational needs section by employing the five planes method, which encompasses five UX design elements. Each element clarifies the issues addressed, making them more concrete and understandable. In this study, the System Usability Scale (SUS) is utilized to test and evaluate the process of improving user satisfaction. By administering questionnaires to 52 respondents, the average SUS score obtained was 75.43. This score suggests that the user acceptance level of the bukuERP application is acceptable, corresponding to a grade of C for the application level, and the application is rated as good. These results indicate a satisfactory level of user satisfaction and application usability. This research underscores the significance of a structured approach that prioritizes users in application development, particularly in digitizing an organization's business operations.

Keywords: digitization; system usability scale; five-plane method; UX design

Abstrak

Sebuah aplikasi enterprise resource planning (ERP) bernama bukuERP yang melayani departemen keuangan, personalia, dan manajemen transaksi memerlukan analisis pengalaman pengguna untuk meningkatkan kegunaan dan kepuasan pengguna secara keseluruhan. Penelitian ini secara khusus menyoroti bagian kebutuhan organisasi dengan menerapkan metode five planes yang melibatkan 5 elemen desain UX. Di setiap elemen, permasalahan yang ditangani akan menjadi lebih jelas sehingga lebih konkrit dan mudah dipahami. Dalam studi ini, System Usability Scale (SUS) dilibatkan untuk menguji dan mengevaluasi dalam proses peningkatan kepuasan pengguna. Dengan menggunakan kuisioner dari 52 responden, diperoleh hasil akhir rata-rata skor SUS adalah 75,43. Skor rata-rata 75,43 menunjukkan tingkat penerimaan pengguna terhadap aplikasi bukuERP dapat diterima, nilai C untuk level aplikasi, dan rating aplikasi adalah baik. Perhitungan ini menunjukkan hasil yang cukup baik dalam kepuasan pengguna dan kegunaan aplikasi. Penelitian ini memberikan pemahaman mengenai pentingnya pendekatan terstruktur yang memprioritaskan pengguna dalam proses pengembangan aplikasi, khususnya digitalisasi bisnis sebuah organisasi.

Kata kunci: digitalisasi; system usability scale; metode five plane; desain UX

INTRODUCTION

The state of technology significantly impacts human lives (Mokhtari Moughari & Daim, 2023). As people's interactions with technology change in the digital era, there is a growing need for applications that are practical but also clear and easy to use. One of the elements influencing economic growth is technical innovation, which

also helps to advance and modernize manufacturing techniques (Mohamed et al., 2022). This paper explores using the Five Planes Method to analyze and improve how users interact in an organization's business application. The Five Planes Method, known for its systematic and detailed approach to UX design, provides a comprehensive process of development that



prioritizes end-user requests and interests. (Asaddulloh et al., 2023).

Developing technology products is usually the main focus from the developer's perspective (Subiyakto et al., 2021). UI and UX are two variables associated with the mentioned issue. UI concerns how a product's visual design connects people with the system (Alomari et al., 2020; Subiyakto et al., 2021). UX, on the other hand, relates to the way consumers interact with products or services. Specifically, both elements are connected to usability or how effectively users utilize a product (Saad et al., 2021). Designing a digital product's user experience guarantees that the finished product genuinely assists the user in achieving their objectives and resolves their difficulties.

By analyzing and improving this application's user experience (UX), this research aims to fulfill this need by offering a distinctive combination of theoretical and practical insights. This related research uses the USE Questionnaire as the evaluation tool. The result obtained from the testing of the prototype with Usefulness (UF) aspect results is 82.88%, Ease of Use (EU) aspect results is 83.91%, Ease of Learning (EL) aspect results is 84.70%, Satisfaction (SA) aspect results are 81.21%, and the result of all usability aspects are 83.11% where Usefulness (UF), Ease of Use (EU), Ease of Learning (EL) respectively affected Satisfaction (SA). (Yanfi & Nusantara, 2023). As a result of using or anticipating a system, sound, or service, users' impressions and reactions are referred to as the user experience. A related study aims to evaluate the state of an e-commerce website's usability and develop it for user interface (UI) and user experience (UX), eventually generating recommendations for interface design. The efficiency level increased with the proposed design, according to the results of the five planes method. This related research gives 67.50 for the SUS score, which means a good assessment (Subiyakto et al., 2023).

Similar studies have been conducted on TCR, an index of user satisfaction that considers four variables: operability, attractiveness, understandability, and learnability. As demonstrated by the outcome, numerous aspects affect user satisfaction, with attractiveness scoring (average 79.65%) higher than other factors (Pusparani et al., 2023).

The study comes from the company's increasing reliance on a digital assistant app to run its operations. This bukuERP application is essential when simplicity and efficiency are essential. However, there still needs to be a

significant knowledge gap about users' unique requirements and preferences, frequently resulting in less-than-ideal user experiences. This application serves the finance department, personnel, and transaction management. A detailed review of associated works in user experience analysis and UX design precedes the investigation.

A UX design documentation application is developed using the five planes method. This research uses the Net Promoter Score method to determine user satisfaction. The results of the Net Promoter Score are -0.89 and -2.056, which means the application needs improvement in some parts (Permatasari et al., 2021). This program helps UX designers, especially new ones, create documentation and understand the UX design process. This study shows that an application with a well-designed user interface can increase by 50% (Permatasari et al., 2021).

This research is essential because it offers a thorough background of the current study. The course provides a comprehensive understanding of the concepts, techniques, and evolution of UX design by exploring a range of historical methodologies and frameworks. Prior studies have been acknowledged for their contributions to this retrospective analysis. It highlights areas of interest and missing requirements in the domain of UX design, especially as they relate to instructional applications. Adopting a method or user experience framework early in the design process is crucial to ensuring that the end product meets the intended audience's needs (Syahrina & Kusumasari, 2020).

The SUS was not intended to evaluate mobile apps, specifically digital health apps (DHAs). This study comprised papers that provided the SUS scores of the analyzed DHAs from 2011 to 2021, providing a 10-year representative. A total of 117 SUS scores for 114 DHAs were identified. For the result, the SUS and the generally established benchmark of 68 (SD 12.5) are appropriate for assessing the utility of DHAs (Hyzy et al., 2022).

RESEARCH METHODS

This study uses the Five Planes Method to evaluate and optimize the user experience. The five-planes method offers a structured approach to conceptualizing the design of user experiences (Garrett, 2011). This method cannot only be implemented in business but also in health, education, etc (Agusdin et al., 2021). This study's phases of research were the first to use literature and questionnaires to gather data. This method

comprises five UX design elements: strategy, scope, structure, skeleton, and surface. The strategy plane comprises the user needs, persona, and product purpose. Feature and its function, as well as content elements, comprise the scope plane. User information architecture comprises the structural plane. The wireframe design comprises the skeleton plane. The prototypes comprise the surface plane. The System Usability Scale (SUS) approach evaluates the design. Usability testing can be a reference to improve an application (Saputra et al., 2022). The System Usability Scale (SUS) is a dependable, affordable usability measure that may be applied to worldwide evaluations of system usability (Brooke, 2020). The research procedure is illustrated in Figure. 1.

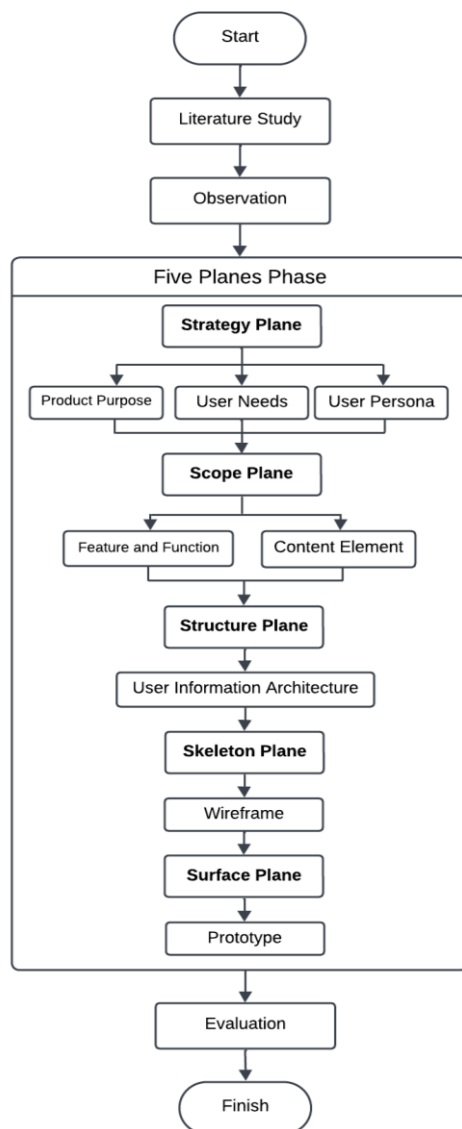


Figure 1. Research procedure

Below is the explanation of each step.

1. Literature Study

Data and material from books, articles, and journals relevant to this topic were gathered through a literature study.

An observation questionnaire was used to collect data. Data from the questionnaire responses will be utilized to create the User Needs. Following the completion of the Five Planes Method, an SUS evaluation was conducted to ascertain the usability outcomes of the generated interface design.

2. Strategy Plane

User needs, personas, and product purpose are analyzed at this point. Product purpose is the core objectives and desired results of the product or interface that is being designed. Product goals, needs, and difficulties are identified through a strategic product analysis. These goals guide subsequent design choices, guaranteeing that the interface's features, content, and user experience align with the central concept. Determining user needs entails knowing what users hope to achieve and modifying the design to suit their goals. Analyses of user needs and product goals are conducted. These requirements encapsulate the target audience's essential traits, actions, and objectives. Personifying users helps designers understand their wants, needs, and pain areas. It helps to customize the interface to meet the demands of various user types.

3. Scope Plane

This phase specifies the interface's features and elements content. Features and interactions are described in detail in the feature and function step, while the information shown by the interface is described in content elements. A functional specification is created at this point. These features are the main emphasis of the development, and the decision was made based on user requirements from the previous stage. Defining the design scope during this phase is essential to ensuring that the features selected meet the user's needs and the product's goals.

4. Structure Plane

At this stage, information architecture entails creating a layout that describes the logical order and connections between features and content. The structure, grouping, and connections between various interface elements are determined by user information architecture, which is essential for designing an easy-to-use experience. These concerns are related to the organized arrangement

and configuration of data within the user interface or product.

5. Skeleton Plane

The process for creating application interface wireframes will be made now. The structural elements, like button placement, navigational paths, and content organization, are the main focus of wireframes (Ernawan et al., 2023). During the wireframing process, prototyping strategies are used to complete the design, resulting in nine interfaces: Purchasing System, Sales Management, Warehouse System, Multi Business, Comprehensive Report, Customer Management, Daily Report Notification, User Privilege Management, and Awesome Support.

6. Surface Plane

This point presents a dynamic product or interface representation. Giving designers and stakeholders a chance to see and feel the finished result transcends a rigid wireframe representation. Prototypes provide a concrete sneak peek at the interface's functionality by simulating user interactions. Before the design is fully developed, this stage enables testing and validation in real-world settings. Prototypes allow designers to get user responses, optimize the user experience, and perform the appropriate modifications.

Figure 2 shows the main dashboard interface of the bukuERP application. The page displays employee data processing, including name data, cellphone number, address, and any actions that can be taken regarding this data.

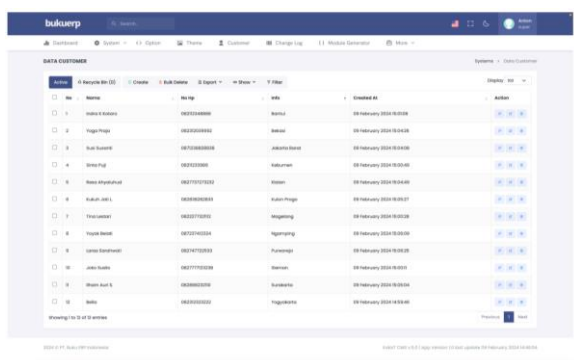


Figure 2. Main Dashboard

Figure 3 assigns access rights and roles to one of the application users. With that role, the user can access permitted features. For example, users can be assigned the super admin or admin role.

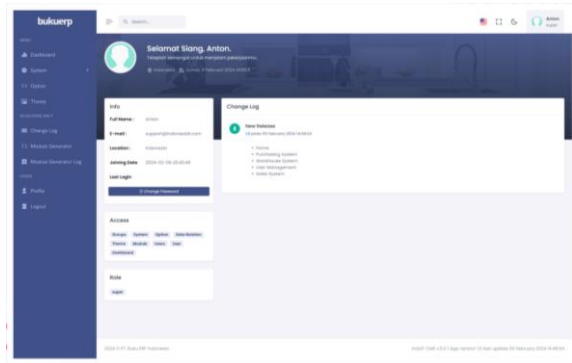


Figure 3. User Functionalities

Figure 4 shows data visualization to support business users in decision-making, analysis, and profit-seeking. Information will be more straightforward for management to view and evaluate if presented graphically, allowing them to make decisions more swiftly and precisely.

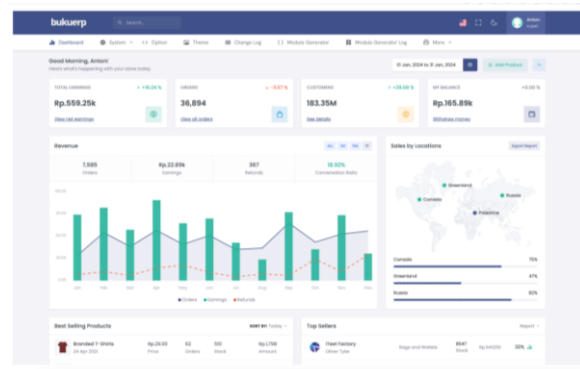


Figure 4. Admin Dashboard

7. Evaluation

The evaluation phase entails determining the interface's or product's general excellence, usability, and effectiveness. This research implements the System Usability Scale (SUS). This method evaluates its usability aspect (Manurung et al., 2024). This technique provides valuable insights into how effectively the interface satisfies user goals and expectations by statistically measuring its usability. The reader can determine the design's positive and negative aspects and potential areas for enhancement by methodically evaluating it using assessment techniques. Design refinement is informed by user feedback and usability assessments. The SUS result demonstrates that the final product maximizes user satisfaction while complying with the objectives specified during the initial stages of the research process. After applying the Five Planes method, evaluation is an essential

phase that involves developing wireframes and prototypes (Hermawan et al., 2023).

RESULTS AND DISCUSSION

These participants are chosen based on the developer team's assessment of the interview's findings, which serve as a representation of the application's intended user base (Alomari et al., 2020; Saad et al., 2021; Subiyakto et al., 2021).

1. SUS Questionnaire

To collect data for this bukuERP application, a questionnaire was combined with the System Usability Scale (SUS) approach, totaling 52 respondents. The System Usability Scale Questionnaire consists of 10 general questions on a 5-point scale. The scale ranges from "Strongly Disagree" as 1 to "Strongly Agree" as 5. Table 1 shows 10 SUS questions for the questionnaire.

Table 1. SUS Questions

Id	Question	Type
Q1	I think I will use this bukuERP application frequently.	Positive
Q2	I found this bukuERP application to be unnecessarily complex.	Negative
Q3	I thought this bukuERP application was easy to use.	Positive
Q4	I think someone else needs help when using this bukuERP application.	Negative
Q5	I found the various functions in this bukuERP application were well integrated.	Positive
Q6	I thought this bukuERP application was very inconsistent.	Negative
Q7	I imagine most people would learn to use this bukuERP application very quickly.	Positive
Q8	I found this bukuERP application very intuitive.	Negative
Q9	I felt very confident using this bukuERP application.	Positive
Q10	I could use this bukuERP application without having to learn anything new.	Negative

2. SUS Calculation

Scores from each statement in the SUS instrument for each responder will gathered to assess the data that has been collected. An overall

SUS score will subsequently be produced by processing these scores. The method of data analysis employed in this study is to compute the data using the System Usability Scale (SUS) formula after gathering data from each respondent. SUS assigns a total score ranging from 0 to 100. A good assessment is described in the SUS half-part (odd statements for 1, 3, 5, 7, and 9). The other questions (even statements for 2, 4, 6, 8, and 10) show inadequate assessments.

The SUS Assessment rules are as follows (Ali Ibrahim et al., 2023; Hasanati & Nashikha, 2023) :

A. For odd statements, the score given by the respondent is reduced by 1. See equation 1.
 $odd = xi - 1$ (1)

B. For even statements, the score given by the respondent is reduced by 5. See equation 2.
 $even = 5 - xi$ (2)

C. After adding up each score, multiply the total by 2.5. The questionnaire has a value ranging from 0 to 100. See equation 3.
 $SUS\ Score = (odd + even) \times 2,5$ (3)

D. After completing each respondent's score, the next step is to find the average score by summing up all the score values and dividing by the total number of respondents. See equation 4.
 $\bar{x} = \frac{\sum x}{n}$ (4)

Where \bar{x} Indicate the average SUS score, $\sum x$ indicates the SUS score summation, and n indicates the respondent's number.

3. SUS Assessment

Three assessments can be derived from the average SUS scores: acceptability ranges, grade scale, and adjective ratings.

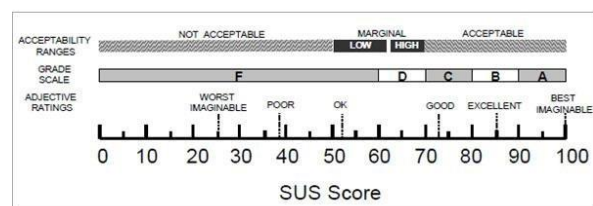


Figure 5. SUS Assessment



Acceptability ranges are based on user acceptance of the application, where 0 to 50 is Not Acceptable, 50 to 70 is Marginal, and 70 to 100 is Acceptable.

The grades A, B, C, D, and F on the grade scale determine the application's grade level. Score 80,3 to 100 for Grade A, 74 to < 80,3 for Grade B, 68 to < 74 for Grade C, 51 to < 68 for Grade D, and 0 to 51 for Grade F.

Adjective ratings are used to establish the application's rating. Adjective ratings have six types: worst imaginable, poor, ok, good, excellent, and best imaginable. Worst imaginable scores from 0 to 25, poor scores from 25 to 39, ok = score from 39 to 53, suitable from 53 to 74, excellent from 74 to 85, and set imaginable scores from 85 to 100.

4. Final Result

The System Usability Scale (SUS) provides an average based on the SUS score calculation from the questionnaires submitted by 52 respondents. Based on the SUS calculator, the average SUS score is 75,43. An average score of 75,43 indicates the user acceptance level of the bukuERP application is acceptable, grade C for the application's level, and the application's rating is good.

CONCLUSIONS AND SUGGESTIONS

Conclusion

This research involved 52 respondents to evaluate the ERP book application; user experience analysis was successfully performed. The bukuERP application's usability was measured using the System Usability Scale (SUS) method, and a score of 75.43 was reached. This score means the bukuERP application gets "Acceptable" in the Acceptability Ranges, a "C" grade in the Grade Scale, and "Good" in the Adjective Ratings. This good result validates the usefulness of the design solutions made during the research and development phase by indicating that the prototype is easy to use.

Suggestion

Further research could investigate how users comprehend and feel at ease when utilizing new or complex features on these platforms and whether there are specific patterns in how users learn new functionalities.

REFERENCES

Agusdin, R. P., Salsabila, A., & Kartika Putri, D. A. (2021). Designing User Experience Design of

the Healthy Diet Mobile Application Using the Fives Planes Framework. *Jurnal Buana Informatika*, 12(1). <https://doi.org/10.24002/jbi.v12i1.4376>

Ali Ibrahim, Onkky Alexander, Ken Ditha Tania, Pacu Putra, & Allsela Meiriza. (2023). Assessing User Experience and Usability in the OVO Application: Utilizing the User Experience Questionnaire and System Usability Scale for Evaluation. *Jurnal RESTI (Rekayasa Sistem Dan Teknologi Informasi)*, 7(4).

<https://doi.org/10.29207/resti.v7i4.5137>

Alomari, H. W., Ramasamy, V., Kiper, J. D., & Potvin, G. (2020). A User Interface (UI) and User eXperience (UX) evaluation framework for cyberlearning environments in computer science and software engineering education. *Heliyon*, 6(5), 03917. <https://doi.org/10.1016/j.heliyon.2020.e03917>

Asaddulloh, B. P., Aminuddin, A., Rahardi, M., Abdulloh, F. F., Saputra, D. I. S., & Alfana, F. R. (2023). UI/UX Development Based on Design Thinking Framework for Mentor on Demand Service. *2023 6th International Conference on Information and Communications Technology, ICOIACT 2023*. <https://doi.org/10.1109/ICOIACT59844.2023.10455862>

Brooke, J. (2020). SUS: A "Quick and Dirty" Usability Scale. In *Usability Evaluation In Industry* (p. 9). CRC Press. <https://doi.org/10.1201/9781498710411-35>

Ernawan, F., Aminuddin, A., & Abu Bakar, S. (2023). A blind recovery technique with integer wavelet transforms in image watermarking. *Engineering Science and Technology, an International Journal*, 48. <https://doi.org/10.1016/j.jestch.2023.101586>

Garrett, J. J. (2011). The Elements of User Experience: User-Centered Design for the Web and Beyond (2nd Edition) (Voices That Matter). In *Elements*.

Hasanati, N., & Nashikha, A. (2023). User Experience Analysis of the Canva Application Using the System Usability Scale (Sus) Method. *Jurnal Perangkat Lunak*, 5(3), 224–231.

<https://doi.org/10.32520/jupel.v5i3.2630>

Hermawan, H., Mahardika, F., Darmayanti, I., Sumantri, R. B. B., Saputra, D. I. S., & Aminuddin, A. (2023). New Media as a Tools

- to Improve Creative Thinking: A Systematic Literature Review. *Proceedings - 2023 IEEE 7th International Conference on Information Technology, Information Systems and Electrical Engineering, ICITISEE 2023*. <https://doi.org/10.1109/ICITISEE58992.2023.10404556>
- Hyzy, M., Bond, R., Mulvenna, M., Bai, L., Dix, A., Leigh, S., & Hunt, S. (2022). System Usability Scale Benchmarking for Digital Health Apps: Meta-analysis. *JMIR MHealth and UHealth*, 10(8). <https://doi.org/10.2196/37290>
- Manurung, R. Y., Krisbiantoro, D., & Utami, D. A. B. (2024). Usability Evaluation of Tokopedia Application Version 3.242 Using System Usability Scale (SUS) Method. *Sinkron*, 9(1). <https://doi.org/10.33395/sinkron.v9i1.13191>
- Mohamed, M. M. A., Liu, P., & Nie, G. (2022). Causality between Technological Innovation and Economic Growth: Evidence from the Economies of Developing Countries. *Sustainability (Switzerland)*, 14(6). <https://doi.org/10.3390/su14063586>
- Mokhtari Moughari, M., & Daim, T. U. (2023). Developing a model of technological innovation for export development in developing countries. *Technology in Society*, 75. <https://doi.org/10.1016/j.techsoc.2023.102338>
- Permatasari, D. I., Fahrul Hardiansyah, F., Ainun Wakhidah, M., & Bagus Afridian Rasyid, M. (2021). UX Design Documentation Application Using The Five Planes Method. *6th International Conference on Sustainable Information Engineering and Technology 2021*, 29–32. <https://doi.org/10.1145/3479645.3479688>
- Pusparani, N. M. E., Setiyorini, T., & Frieyadie, F. (2023). Usability Testing Analysis on Digital Wallet Applications to Measure User Satisfaction. *Jurnal Riset Informatika*, 5(4). <https://doi.org/10.34288/jri.v5i4.119>
- Saad, J., Martinelli, S., Machado, L. S., de Souza, C. R. B., Alvaro, A., & Zaina, L. (2021). UX work in software startups: A thematic analysis of the literature. *Information and Software Technology*, 140. <https://doi.org/10.1016/j.infsof.2021.106688>
- Saputra, D., Ardiyan Syah, E., & Darnis, F. (2022). Usability Testing on the Simponik Website using the System Usability Scale (SUS). *Sinkron*, 7(4). <https://doi.org/10.33395/sinkron.v7i4.11916>
- Subiyakto, A., Rahmi, Y., Kumaladewi, N., Huda, M. Q., Hasanati, N., & Haryanto, T. (2021). Investigating quality of institutional repository website design using usability testing framework. *AIP Conference Proceedings*, 2331. <https://doi.org/10.1063/5.0041677>
- Subiyakto, A., Utami, D. P., Nurmiati, E., Yuniarto, D., Sopandi, A., & Kaffah, F. M. (2023). Adopting Five Planes Framework for Developing User Interface based on User Experience Aspects. *2023 11th International Conference on Cyber and IT Service Management, CITSM 2023*. <https://doi.org/10.1109/CITSM60085.2023.10455146>
- Syahrina, A., & Kusumasari, T. F. (2020). Designing User Experience and User Interface of a B2B Textile e-Commerce using Five Planes Framework. *International Journal of Innovation in Enterprise System*, 4(01). <https://doi.org/10.25124/ijies.v4i01.47>
- Yanfi, Y., & Nusantara, P. D. (2023). UI/UX design prototype for mobile community-based course. *Procedia Computer Science*, 216, 431–441. <https://doi.org/10.1016/j.procs.2022.12.155>

