

UI/UX Design of a Decision Support System to Determine Lecturer Research Linearity using the Design Thinking Method

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ABSTRACT

The goal of this study is to develop a prototype UI/UX Decision Support System for Determining Lecturer Research Linearity based on user needs, in which users can manage research data, determine the suitability of research conducted by lecturers with their scientific fields, provide a basis for decision-making in determining whether lecturer research should be continued, and provide an overview to decision-makers regarding lecturer performance. This study used the design thinking technique, which is divided into five stages: obtaining information from users, analyzing user needs, generating ideas for solutions to user problems, creating prototypes to solve user problems, and testing and improving prototypes. This study successfully created a decision support system design and prototype that is centered on user demands and comfort. Prototype testing was carried out by UI/UX design experts. The test findings demonstrate that users respond positively to the decision support system interface and that most functionalities work properly. This demonstrates that the decision support system prototype was created with user demands, functional suitability, and convenience of use in mind. The findings of this study are expected to be used in associated institutions or agencies to collect feedback for future system improvement.

INTRODUCTION

Currently, the world is facing the industrial revolution 4.0 and society 5.0 (Wibowo 2023). The rapid development of artificial intelligence (AI) technology and its global use has influenced various fields (Teknowijoyo and Marpelina 2021). One of the fields that is experiencing rapid growth as a result of current technological developments is the information field (Nadhif et al. 2021). The increasing need for information supported by adequate information technology, when needed by every group in various fields (Nadhif et al. 2021). Based on information derived from data that has been processed in a relevant manner, users can make decisions about a problem more quickly and accurately (Yuswardi et al. 2022). No exception, information technology has also penetrated the world of education. In the world of education, there are demands for the implementation of effective and efficient processes in an effort to support strategic and operational management in order to achieve quality performance targets (Indrajit 2011).

The use of information technology makes the work mechanism faster, cheaper, and better for the organization or institution, and is certainly very beneficial for stakeholders. Through the use of information technology, manual work that is still done by educational practitioners can be simplified and automated (Indrajit 2011). The development of information systems that occurs today is one proof that the world community is very dependent on information technology in its life (Efendi et al. 2023). In general, information systems can assist managers in understanding operational and performance related problems, besides that, information systems can also assist in decision making (Jumaryadi et al. 2024). In a computer-based system, the user interface is the most important element (Rochmawati and Albar 2022). Interface is very important in web-based systems, this is because all web-based systems have a user interface. A poor interface can frustrate users and can affect productivity and experience in using a system (Rochmawati 2019).

User interface (UI) design is an important thing that must be considered before creating a system to meet user needs (Maulana and Satriyawan 2024). The next most important aspect in creating a good system is user experience (UX), which is a combination of aesthetic, visual, and emotional aspects that are influenced by the ability of a product (system) to be used (Ardiansyah and Rosyani 2023). One method commonly used to create UI/UX designs is the design thinking method. The design thinking method facilitates understanding of potential user needs through direct experimentation, prototype design, or product visualization.

This research uses the design thinking method in making UI/UX designs. The design thinking method is a strategic paradigm that focuses on user needs in an effort to overcome challenges and create new innovations (Maulana and Satriyawan 2024). In this method, there are several stages, namely the stages of collecting information about users, identifying user needs, finding ideas as solutions to problems, developing product concepts based on solution ideas, testing product concepts, testing products to get user feedback (Widiyantoro et al. 2022). This user feedback is the basis



for further product development. This research aims to develop a UI/UX design model using the design thinking method in the construction of the Information System for Determining the Linearity of Lecturer Research using the Simple Additive Weighting (SAW) Method and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS).

LITERATURE REVIEW

Some previous studies related to the use of design thinking methods in developing UI / UX design models include those conducted by Nadhif et al., (2021) who in their research applied design thinking methods to the design of design and custom clothing sales applications that facilitate large-scale ordering (Nadhif et al. 2021). Furthermore, research by Maulana and Satriyawan (2024) in their research resulted in a good user interface design and proper feature integration, as well as a satisfying user experience on the development of the Dutamas Komputer service website (Maulana and Satriyawan 2024). Mustika et al., (2024) in their research succeeded in creating a prototype user interface using the Figma application, which has been tested and refined based on user feedback, the design developed is expected to improve user experience when using the Selayar Virtual Tour system (Mustika et al. 2024).

Pawenrusi et al., (2024) in their research produced a prototype stunting survey application that was in accordance with user needs, functional suitability, and easy to navigate by users (Pawenrusi et al. 2024). Finally, research by Azhari et al. (2024), based on tests conducted on the Istiqomah application design model using the design thinking method, obtained a positive level of user satisfaction (Azhari et al. 2024). Based on the successful use of the design thinking method in these previous studies, the research conducted here also uses the design thinking method in designing the UI/UX design model of the developed decision support system.

METHOD

In research on designing UI/UX design models for Information Systems for Determining Lecturer Research Linearity using SAW and TOPSIS Methods, researchers use the design thinking method. The research stages carried out are shown in Figure 1.

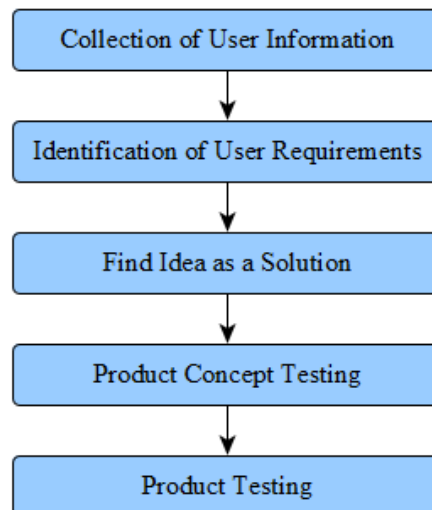


Figure 1. Research Methods

At the user information collection stage, an understanding of who the target users of the developed system are, as well as the parties related to this system. Furthermore, at the user needs identification stage, the researcher explores the user's needs for the system being developed. The idea discovery stage as a problem solution, the researcher created an idea as a solution to the problem at hand, namely enabling ordinary users to be able to use the system developed without experiencing difficulties, besides that users also gain comfort in working using this system. In the next stage, researchers created a UI/UX prototype, then tested the product concept. After getting user feedback from the results of testing the product concept, researchers conducted final product testing. Figure 2 below is a use case diagram of the Information System for Determining Lecturer Research Linearity using SAW and TOPSIS Methods.

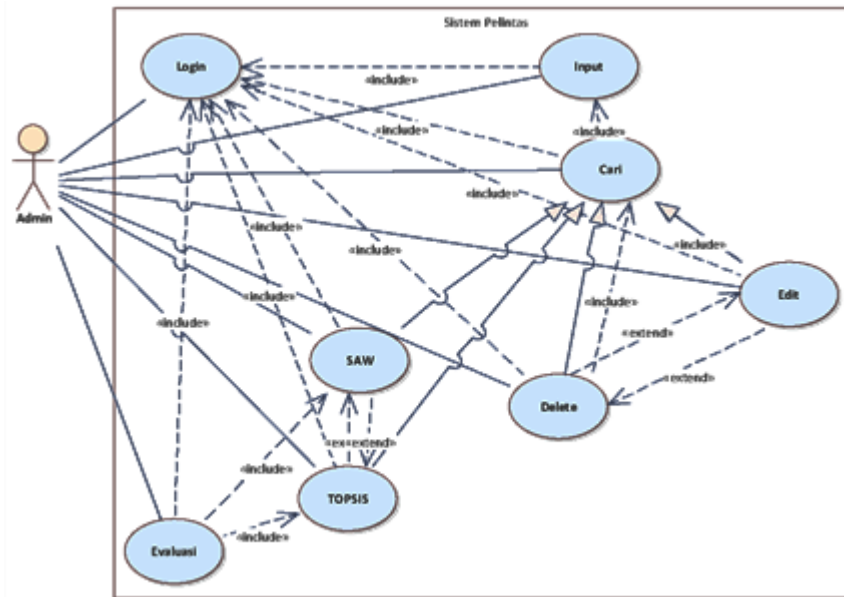


Figure 2. Use Case Diagram

RESULT

Making UI/UX design in this study using the Figma application. The user interface design for the login page is made as simple as possible so that the user (admin) does not have difficulty in logging in. The login page is made less crowded so that users are comfortable with the appearance of the website and can immediately see the name of the system developed in the research. The user interface design on the login page uses the form fill in interaction style. In the user interface design of the login page, there are two fields as the location for filling in the user username and password data, and at the bottom there is a login or sign in button that can be pressed by the user after filling in the username and password data. The user interface design for the login page is shown in Figure 3.

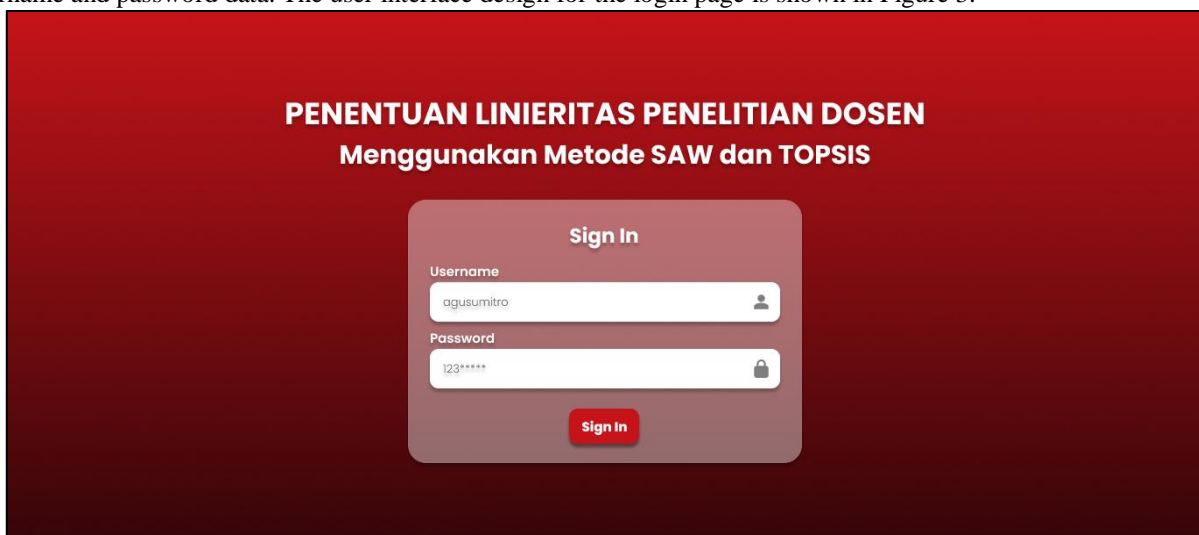


Figure 3. Login Page User Interface Design

After the user has successfully logged in, the system will direct the user to the admin dashboard page. The design of the admin dashboard page is shown in Figure 4 below:

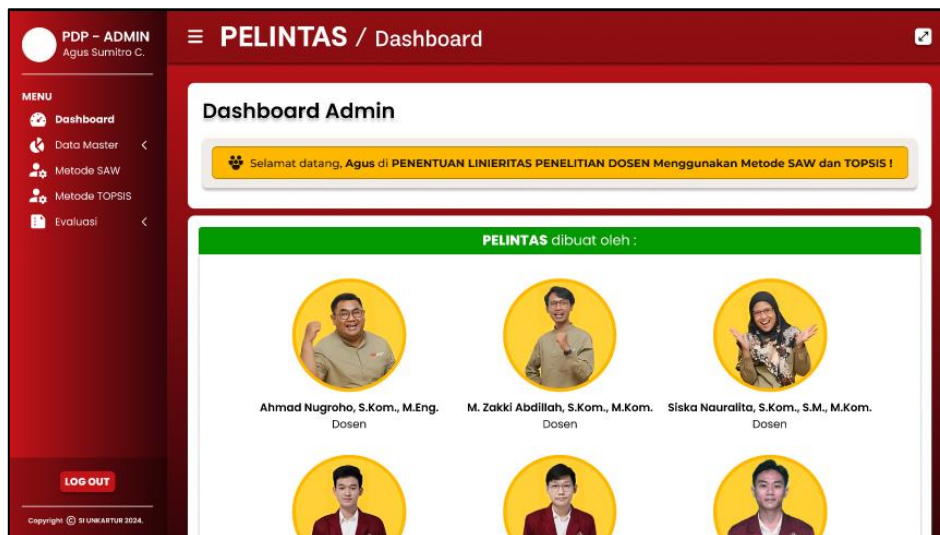


Figure 4. User Interface Design of Admin Dashboard Page

The user interface design for the calculation page using SAW and TOPSIS methods is made based on the title of the lecturer's research, where each title is given a button to perform the calculation process shown in Figure 5.

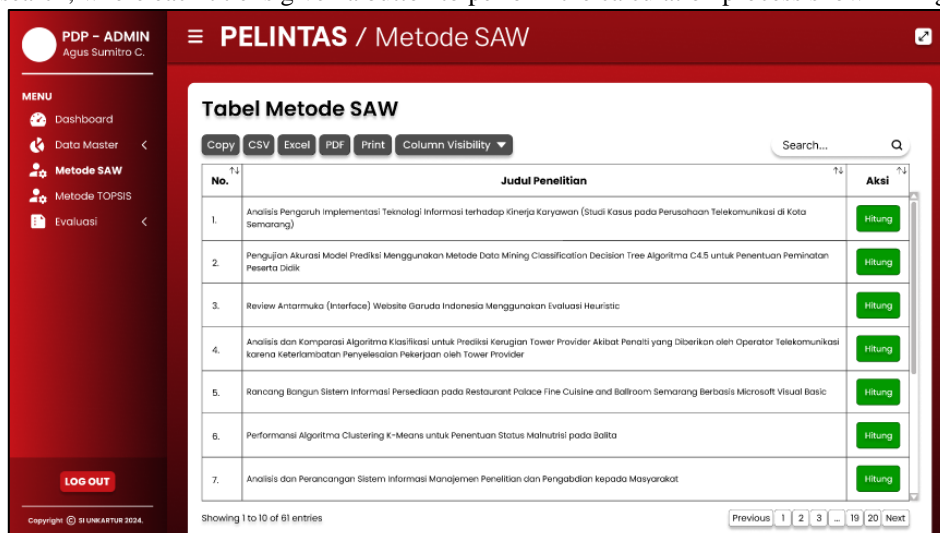


Figure 5. Design of User Interface for SAW and TOPSIS Method Calculation

When the user presses the calculate button, the user enters the research form used to input lecturer research data and presses the save button. The user interface design of the SAW calculation research data input form is shown in Figure 6.

Figure 6. User Interface Design of Research Data Input Form SAW Calculation

While the user interface design of the TOPSIS calculation research data input form is shown in Figure 7.

Figure 7. User Interface Design of Research Data Input Form TOPSIS Calculation

After the calculation process using SAW and TOPSIS methods, users can evaluate or test the SAW and TOPSIS methods used in one lecturer's research title. In the evaluation process, the accuracy and MSE values of the two methods are compared. The user interface design of the evaluation page is shown in Figure 8.

No.	Judul Penelitian	Hitung	Hasil
No data available in table			

Figure 8. User Interface Design of Evaluation Page

DISCUSSION

UI/UX design on the Information System for Determining Lecturer Research Linearity using SAW and TOPSIS Methods using the Figma application. The use of Figma application helps researchers in designing prototype UI/UX of the developed system. The use of the design thinking method has also helped researchers in understanding user needs in more detail through its stages, so that the system developed later matches user expectations. In addition, the design thinking method also helps researchers in identifying user problems and finding ideas as innovative solutions to these problems. Through this UI/UX prototype, it is expected that users will feel easy and comfortable in operating the developed system.

CONCLUSION

This research has successfully created a UI/UX prototype of Information System for Determining Lecturer Research Linearity using SAW and TOPSIS Methods using Figma application through the application of design thinking method. This prototype has gone through initial and final testing. The test results show that the prototype developed is in accordance with user needs and functionally appropriate. This UI/UX prototype is expected to be implemented in the development of a decision support system that is built, thus increasing user satisfaction and experience in operating the system developed.

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