The Implementation of User Centered Design Method in Developing UI/UX

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Abstract

The university has an academic information system called AIS, of which students are one of the main users. Based on the results of the questionnaire from previous research, it has been proven that the AIS display still needs development. This research develops the UI/UX of AIS to better suit the needs of users with the UCD method. Starting from planning agreements with parties related to research, determining the context by interviewing parties who agreed in the first stage, determining needs with questionnaires to users, using the System Usability Scale (SUS) method to determine the results, designing a prototype based on the results of the third step, and UI/UX evaluation, which is carried out using the same method when evaluating the UI/UX AIS running in the third stage to prove whether there has been a significant improvement or not. The evaluation results show that there is
an increase in UI/UX, and based on statistical tests, there is a significant difference between the current UI/UX AIS and the UI/UX AIS being developed. In the process of evaluation and statistical tests, even though the SUS calculation results were still marginal, the two AIS questionnaire results proved to have significant differences. So that the results of this study can be accepted, improvements can be made in the future.

Keywords: UI/UX, AIS, UCD, usability, SUS.

INTRODUCTION

The role of the system is an important requirement for an organization, activity, business, and information, as well as for higher education institutions, which also utilize the academic system to provide information and facilities regarding matters related to lecture activities on campus. The academic system is called the Academic Information System (AIS). Academic application is an academic application-based system facility that contains profiles and progress of student academic activities from selecting courses to saving student grade reports, as well as other student information such as history of scholarships attended, history of payment of tuition funds, personal information from student biodata, etc. All lecture support features are available in the system. Starting from student/teacher/staff information, a list of lectures and their schedules, the single tuition payment system (UKT), student grade data, etc. That way, several campus activities can be accessed practically by simply logging in to an account using the main number from the system database or registered email. All campus activity data is stored in the academic information system.

Based on Mukti's writings (Mukti, n.d.), so far, the Academic System has played an important role as an information support facility for campuses, connecting lecturers, students,

campuses, and the community as a medium of education. Thus, the system is also used as a center for online activities as well as a lecture data center. Over time, the academic system has accompanied users around the university since its inception in 2006. However, the appearance of the application and its interaction, or what can be called UI and UX (User Interface and User Experience), require development. This is evidenced from the results of the experience questionnaire using an academic information system in terms of appearance, namely UEQ Benchmark Comparison Calculations. AIS For students, the scale of Attractiveness, Accuracy, stimulation, and Novelty results in the bad category, which is included in the range of 25% of products that have the lowest score. As for Clarity, it gets the Below average category, which means that 50% of the products in the dataset have a higher score while the other 25% have a lower score. From this UEQ measurement, it can be concluded that, in terms of the User Experience, the current academic information system still has many deficiencies. There are many ways to do UI and UX updates. One of them is the UCD (User-Centered Design) method, which is a development model focused on the role of the user in determining their needs. This is in line with the design, which places the user at the center of the UI/UX prototype development process. UCD has four principles in application development, namely: user focus, integrated design, user testing, and interactive design. The reason the author uses the UCD method to solve problems from his research is because this method is very focused on fulfilling user requests for an application and has been proven to produce accurate usability values. In addition, this method has been widely applied by researchers in previous literature.

There are several studies related to research on developing the appearance of an academic information system because the methods and objectives are in line, such as research from the literature studies that the authors observed, resulting in a prototype system proposal for the Beskem community aggregator application with the UCD approach. The problem is that existing community-based applications are less attractive to users. The data support is in the form of survey results on the percentage of interest in application display and its rating on the Play store site. The solution to the formulation of the problem is to work on its development using the UCD method because it is able to increase usability, which provides comfort, efficiency, and convenience. This is in line with the purpose of UCD as stated by the author. The results of this study can be accepted by users based on the SUS and SEQ testing methods, which get large scores, meet the criteria, and increase significantly. Where the result score from the SEQ method produces 3 values: namely, 5, 6, and 7. And the score from the application's display of questionnaire results with the SUS method produces a score of 84.5. So that the method of this research is very good for completing the research carried out by the author. The problem is that the academic information system requires changes in terms of appearance and its use as a student interactive tool. This is evident from the data support provided by the results of the questionnaire cited by the researcher for the formulation of the problem based on ISO 13407. The solution is to design a microservice UI/UX that can be done using the Five Planes method. The author's reason is that with this method, the User experience or interface of a product will be easier to understand if it is explained in the form of a conceptual model. The final results of the test show that the increase in the appearance of the academic information system from the initial appearance to the development display of the method has experienced a significant increase.

METHOD

The data collection process that will be carried out by the author in helping to complete this writing is library studies. This data collection was carried out by taking sources from several theses, articles from applications, and journals that have suitable data to complete this

research. In addition to this, it can be taken from scientific reference books related to this case. Comparison of similar literature studies related to the case of this thesis is very important for determining the research of this thesis. Because of this method, this research becomes more perfect in its components and obtains more complete data and information. So that this thesis can be completed quickly and precisely. In addition, the author proves that there is a problem with this research by taking the results of an experience questionnaire using AIS conducted by Adissa Vintha (2021), namely Calculation of UEQ Benchmark Comparisons. Then the current academic information system questionnaire and the prototype AIS questionnaire that the author will make. The UI/UX design approach methodology adopted by a certain name to produce user-friendly UI/UX. Several stages of his research are: planning the human-centered process; specifying the content of use; specifying the user and organizational requirements; producing a design solution; and evaluating the design.

RESULT AND DISCUSSION

The average results of the prototype evaluation questionnaire for academic information systems for each usability criterion and feature display category have proven to have increased. The results of the first category questionnaire, namely the overall or general features of the academic information system, with each question representing the usability criterion value. Satisfy criteria scored 56%, increased by 4%; learnability and memorability scored 53%, increased by 7.3%; efficiency scored 62.5%, increased by 8%; and free error obtained a score of 43.5%, increased by 11.15%. Thus, the four scores experienced an increase compared to the previous questionnaire, although scores above the average still touched the marginal acceptance criteria and for free errors still touched rejection. The results of the second category questionnaire, namely the student profile menu feature, with each question representing the usability criterion value. Satisfy criteria scored 53.5%, increased by 4.4%; learnability and memorability scored 52.5%, increased by 7.8%; efficiency scored 50%, decreased by 6.1%; and free error obtained a score of 49.5%, decreased by 4.5%. So, of the four scores, two have increased and two have decreased. This has been analyzed by the author, who says that the interaction is less efficient because the scroll can only use the arrow keys and there are still buttons in the bio that don't work properly.

The results of the third category questionnaire, namely the student lecture menu feature, with each question representing the value of the usability criterion. Satisfy criteria scored 53%, increased by 8%; learnability and memorability scored 54.5%, increased by 9.5%; efficiency scored 55.5%, increased by 6.5%; and free error obtained a score of 37.2%, increased by 7.8%. Thus, the four scores experienced an increase compared to the previous questionnaire, although scores above the average still touched the marginal acceptance criteria and for free errors still touched rejection. The results of the fourth category questionnaire, namely the student report menu feature, with each question representing the usability criterion value. Satisfy criteria scored 59.5%, increased by 4.4%; learnability and memorability scored 52%, increased by 5.3%; efficiency scored 60.5%, increased by 7.8%; and free error obtained a score of 52.5%, increased by 9.3%. Thus, the four scores have increased compared to the previous questionnaire, although the scores above the average still touch the marginal acceptance criteria. The results of the fifth category questionnaire, namely student scholarship and graduation menu features, with each question representing the usability criterion value. Satisfy criteria scored 62%, increased by 8%; learnability and memorability scored 49%, increased by 3%; efficiency scored 57%, increased by 6.2%; and free error scored 51%, increased by 7.9%. Thus, these four scores have increased compared to the previous questionnaire, although scores above the average still touch the marginal acceptance criteria and the learn & memo score still touches the rejection range score.

Results average score based on per-display criteria, academic information system features general/overall feature display criteria scored 53.8%, an increase of 7.7%; profile menu feature display criteria earned a score of 51.4%, an increase of 0.4%; lecture menu feature display criteria earned a score of 52%, an increase of 7.7%; report menu feature display criteria earned a score of 56.1%, an increase of 6.7%; and scholarship and graduation menu feature display criteria scored 54.8%, an increase of 6.8%. Thus, the five scores have increased compared to the previous questionnaire, although the scores above the average still touch the marginal acceptance criteria. For the total average score per criterion, satisfy criteria obtained a score of 56.8%, which increased by 6.2%; learnability and memorability obtained a score of 52.2%, which increased by 6.5%; efficiency obtained a score of 57.1%, which increased by 4.3%; free error obtained a score of 48.3%, which increased by 6.3%; and lastly, the average usability criteria obtained a score of 53.6%, which increased by 5.8%. Thus, the score of these criteria along with the total average has increased compared to the previous questionnaire, although the score above the average still touches the marginal acceptance criteria and the error score still touches the rejection range score. The final results of the calculations are still not in accordance with the acceptable range standards; almost all of them are at the marginal level except for errors. At least it's improving. To prove the increase is significant or not, the author will test the two results of the prototype questionnaire with the current academic information system with the intended hypothesis, namely: "H1: The results of the questionnaire survey interface display of the current academic information system with the author's prototype have increased with a different final score. significant" with the opponent's hypothesis if the next step does not meet H1, namely: "H0: The results of the questionnaire survey display of the current academic information system interface with the author's prototype have increased with a non-significant difference in the final score."

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CONCLUSION

The author develops a recommendation prototype of an academic information system through a UCD (user-centered design) approach. The UCD approach is divided into five processes, namely plan the human-centered process, where the author begins to conduct interview agreements and collaborates with developers and experts of academic information systems at PUSTIPANDA while introducing his research, Specify the Context of Use, where the author asks interview questions to informants related to the UI/UX of the academic information system; specify the user and organization requirements, which is a method of finding academic information system user requirements related to the UI/UX by conducting an online questionnaire survey to 330 students as users, and the results of the questionnaire will be concluded through SUS (System Usability) calculations. Scale), Produce a design solution in which the author designs an academic information system prototype with a UI/UX design application tool called figma, and finally be evaluated using the evaluate design against requirement method, in which the system that needs to be developed re-checks its features. After that, a questionnaire was given to the previous users, totaling 50, to find out their opinions regarding the prototype. Then the results are summarized through the calculation of SUS.

The test results from the evaluation stage yielded a satisfy criterion score of 56.8%, an increase of 6.2% from the current AIS; learnability and memorability obtained a score of 52.2%, an increase of 6.5% from the current academic information system; efficiency obtained a score of 57.1%, an increase of 4.3% from the current time; and free error obtained a score of 48.3%, an increase of 6.3% from now; and finally, the average criterion score of 53.6, where the score has increased by 5.8% compared to the initial questionnaire, and this score does not meet the acceptance standards of the SUS concept. However, the authors use another way to be accepted, namely by comparing the score results of the evaluation questionnaire for the academic information system prototype with the initial questionnaire using the statistical method of testing the hypothesis with two samples. The results of increasing the score proved to be significant. Even though the average results of the previous academic information system prototype questionnaires were still on the marginal/neutral acceptability scale, not yet accepted, the test for differences in the results of the UI/UX prototype academic information system questionnaire proved to have a significant difference. Therefore, it was found that the difference in the value of the results of the UI/UX prototype academic information system questionnaire proved to be significant. So that the results of this study can be accepted and can be done for the future, which requires improvement.

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