User Requirements Analysis of Digital-Based Solutions for Supporting Disabilities using User Journey Map (Case Study of PSLD Brawijaya University)

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Received 28 May 2022; accepted 10 June 2022

Abstract. Disability is any condition of the body or mind that makes it more difficult for the person with the condition to do certain activities and interact with the world around them. Persons with disabilities need assistance in various fields related to their limitations to improve their quality of life. Either area that needs to be optimized to fulfill the rights of persons with disabilities is inclusive education. Brawijaya University supports inclusive education by establishing an organizational institution called Pusat Studi dan Layanan Disabilitas Universitas Brawijaya (PSLD UB). PSLD UB provides peer tutoring services by involving non-disabled students (volunteers) to assist students with disabilities during academic activities. So far, the process of implementing peer tutoring has often encountered problems due to schedule changes or other unexpected activities, causing schedule mismatches between volunteers and students with disabilities. To fulfill disability rights, it’s necessary to have a digital solution in peer tutoring activities, while to design the solution it’s necessary to analyze the right user requirements. Therefore, the purpose of this research is to analyze user requirements to optimize user experience, so that developers can use it to develop peer tutoring systems. This study applies a User Journey Map to analyze user requirements to know the description of the user's steps in achieving the goal. The selection of respondents was based on purposive sampling technique with the criteria of respondents who had carried out the peer tutoring process. From the results of this study, it was found three main features that suit user requirements are automatic replacement, emergency requests, and list of available volunteers.

Keywords: User Journey Map, User Requirements, Disability, Inclusive

1 Introduction

A disability is any condition of the body or mind (impairment) that makes it more difficult for the person with the condition to do certain activities (activity limitation) and interact with the world around them (participation restrictions) [1]. Due to the limitations they experience, people with disabilities need attention to support their lives. They need help in various areas related to their limitations to improve their quality of life. Either area that needs to be optimized to fulfill the rights of persons with disabilities is inclusive education.

By Government Regulation Number (No.) 70 year 2019 concerning Planning, Implementation, and Evaluation of Respect and Fulfillment of the Rights of Persons with Disabilities, the State of Indonesia has begun to provide service solutions and
implement inclusive education, especially in higher education. Either of the universities that implement inclusive education is Brawijaya University. Brawijaya University supports inclusive education by establishing an organizational institution called Pusat Studi dan Layanan Disabilitas Universitas Brawijaya (PSLD UB).

PSLD UB is an institution that functions as a research center on disability issues and the provision of services for persons with disabilities at Brawijaya University. PSLD UB was formed to build the atmosphere of the Brawijaya University into a campus that is friendly to people with disabilities and to realize equal rights to education like the general public. PSLD UB provides physical and non-physical services for persons with disabilities such as tutoring and counseling, as well as providing accessibility services, accommodation, and so on. Peer tutoring for students with disabilities is a service from PSLD UB that includes volunteer students, which are non-disabled students who are willing to accompany students with disabilities during academic activities. This service is in accordance with previous research that an effective learning process service to help students with disabilities achieve academic success is the peer tutoring method [2]-[3].

So far, the process of implementing tutoring for students with disabilities at Brawijaya University is still experiencing problems, including when suddenly there is a time mismatch between students and their volunteers. Because of that, an evaluation process is needed for students with disabilities who undergo peer tutoring services from PSLD UB. The purpose of the evaluation process is to produce solutions and increase positive experiences in the process of assisting students with disabilities in carrying out academic activities, thus the rights of students with disabilities in carrying out academic activities can be fulfilled.

Based on the problems that have been mentioned, researchers need to dig deeper to find problems that have not been clearly defined in peer tutoring activities. In addition, researchers will dig deeper to understand the user requirements of students with disabilities to create a user experience and become a useful digital-based solution. From the analysis of user requirements found, it’s hoped that this can be a solution idea to support further development.

The effective method used to determine the user requirements of students with disabilities in the process of academic activities is the User Journey Map. User Journey Map can describe the problems and objectives of the project design, all activities to be carried out, and all the personas involved [4]. The User Journey Map method is an appropriate tool in this research, because this method can understand and identify user requirements, and can be used to improve existing services or to develop new services. There are already many user journey map used by companies to improve existing services or to develop new service. However, user journey map it’s not compatible for all problems because there is no clear design yet [5].

The development in this study focuses on the User Experience of students with disabilities in conducting academic activities with volunteers, because User Experience (UX) Design can be one of the innovative tools to improve product quality and can provide comfort for users. This is following the definition that User Experience is how users feel or assess satisfaction and comfort with a product, system, and service [6]. By knowing the user experience of students with disabilities, it will increase the positive experience in the peer tutoring system.

This study aims to propose ideas and explore the concept of User Experience to get an innovative design by taking into account the user requirements and ensuring that no User Experience factor is ignored. So in this study, user requirements analysis was carried out using the User Journey Map. User Journey Map is used to map user activities, understand the problems that occur in each activity, and find solutions to be
developed.

2 Method

The stage will begin with literature study, then proceed with information collection, data analysis, formulation of solutions, and ends with drawing conclusions and suggestions. The stages of this research are shown in Figure 1

![Diagram of Research Method Flow]

Figure 1. The Flow of Research Methods

In the first stage, literature study on several relevant materials. Next is the collection of information which is done using interviews. After getting information from respondents, the data will be analyzed using a user journey map. After the data is processed with the user journey map, the data will be sorted into solutions in order of priority. Then from these results conclusions will be drawn about solution ideas that can be developed.

3 Results and Discussion

3.1 Literature Study

At this stage, researchers collect references that are used as supporters in carrying out research. Supporting references needed in this research include User Experience and User Journey maps. The library sources used are books, journals, research reports, theses, and theses that already exist, as well as the results of library searches on the internet.

3.2 Collecting Information

The stage in collecting information begins with developing research instruments. The researcher prepared research questions and made a google form for collecting the identities of students who were willing to become respondents. After getting the identity and willingness of the respondents, the researcher will proceed to the interview stage. The information collection was obtained from respondent’s answers.

The selection of respondents was based on a purposive sampling technique.
Purposive sampling technique is a sampling technique based on criteria from researchers to achieve certain research objectives [7]. The respondent’s criteria are students with disabilities at Brawijaya University who have experienced a peer tutoring process when carrying out academic activities.

There are seven respondents who are willing to conduct interviews, specifically from the types of deaf, visual impairment, low vision, hearing disability, and cerebral palsy. This stage is to learn and understand what the problems are in the peer tutoring process for students with disabilities. Researchers immerse themselves thoroughly in cultivating empathy for them to gain insight into what they need, want, and how behave.

3.2 Data Analysis

After the data was collected, the researcher processed the data by creating a user journey map in Figure 2. to describe what students with disabilities felt and how they felt when doing the peer tutoring process. The results of the user journey map can be used as a reference for designing user experiences in developing digital solutions to achieve the goals expected by students with disabilities.

![Figure 2. User Journey Map](image)

The scenario mapping on the user journey map explains the flow of scenarios for students with disabilities during Upload Schedule (P1), Receive Schedule (P2), Confirmation (P3), Peer Tutoring (P4), and Report (P5). Of the five scenarios, each stage of the scenario has problems and solutions that can be adapted to user requirements. Problems and solutions for digital-based systems can be seen in Table 1 below.
In Table 1. It is explained that the problems that occur in the guidance process according to students with disabilities include too random plotting, which is the distribution of volunteer schedules that are not in accordance with the field of science or social humanities, this can hinder understanding. Therefore it’s necessary to have a feature to suggest field selection. Furthermore, there are obstacles when confirming to volunteers, which is when there is no response from volunteers, volunteers suddenly have a problem, and it's hard to make the change process. The solution offered is the existence of volunteer exchange requests or automatically replaced when there is no confirmation during the given time, so that if volunteers experience sudden problems or are unprepared, they can be automatically replaced with other volunteers without the difficulty of finding a replacement.

Then there are problems when carrying out academic activities with volunteers, problems that may occur change in class schedules, sudden needs or obstacles from volunteers so that they cannot come to help, and the difficulty of finding a replacement suddenly. Therefore, it’s recommended to have an emergency call/ request feature, so that if students encounter sudden problems during lectures, they can be assisted by other volunteers and not alone. For the last when reporting activities, problems that may occur is no feedback from advice that has been given by students with disabilities. In this case, there should be regular scheduling for discussions related to the peer tutoring process and students with disabilities being given the facility to provide opinions or assessments as suggestions for the future.
3.3 Result

Based on the results of data that has been processed with a user journey map, researchers formulate solutions to determine the priority features needed by students with disabilities. The assessment of user requirements features is presented in Table 2, with the assessment made by respondents. They give 1 point if the feature is necessary and 0 points if it’s not necessary.

Table 2. User Requirements Assessment

<table>
<thead>
<tr>
<th>No.</th>
<th>Feature</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Suggestions for plotting volunteer</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Request the same field volunteer</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Volunteer exchange requests (in case of problems)</td>
<td>6</td>
</tr>
<tr>
<td>4.</td>
<td>Automatic replacement (in case of sudden problems)</td>
<td>7</td>
</tr>
<tr>
<td>5.</td>
<td>Emergency request</td>
<td>7</td>
</tr>
<tr>
<td>6.</td>
<td>List of available volunteers</td>
<td>7</td>
</tr>
<tr>
<td>7.</td>
<td>Routine evaluation schedule</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>Feedback text</td>
<td>3</td>
</tr>
</tbody>
</table>

Looking at the results of the assessment in Table 2, it’s found that the features that get the most points with a score of 7 are the automatic replacement, emergency request, and list of available volunteer features. The next prioritized features are volunteer exchange requests, then suggestions for plotting volunteers, requests for the same field volunteers, routine evaluation schedule, and feedback text.

4 Conclusion

Based on the research, there are three main features that students with disabilities need to have in the peer tutoring system, that is automatic replacement, emergency requests, and list of available volunteers. This research helps developers in building a disability support information system that is appropriate to user experience and user satisfaction from the side of students with disabilities. Suggestions that can be given as consideration for further research and development is to add user persona analysis to find out other types of related users, and it’s hoped to make research from volunteers and PSLD UB staff who have direct contact with students with disabilities, so that can improve the development of a more effective system for all users.

Acknowledgments. We would like to say big thanks to Computer Science Faculty and Disability Service Center University of Brawijaya for supporting this research.

References
