USER INTERFACE AND EXPERIENCE IMPLEMENTATION ANALYSIS ON THE MADRASAH ALIYAH RAUDATUL YATAMA INFORMATION SYSTEM

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Abstract The use of information technology in the field of education aims to make educational organizations or institutions more efficient. One example of information technology in the world of education is building a school information system, one of which is the academic information system for Madrasah Aliyah Raudatul Yatama. Based on the evaluation results of improving the quality of the Raudatul Yatama Madrasah Aliyah information system, the suggestions for improvement that are the focus are the measurement aspects that direct the user interface to a simpler level but have high usability. Because more than half of the respondents stated that the user interface still needs development both in terms of appearance and usability. Therefore, the developer of the Madrasah Aliyah Raudatul Yatama information system can focus more on the aspects included in these criteria for better system quality.

Keywords: School Information System • Heuristic Evaluation • User Interface • User Experience.

Introduction

At this time information technology is developing rapidly which makes it easier for us to make good use of it in terms of managing, accessing, and utilizing information thoroughly and accurately. The good impact of advances in information technology is very much in various fields, one of which is in the field of education. Technology in the world of education helps facilitate the learning process (Buana and Sari, 2022). One example of information technology in the world of education is building an academic information system for schools, one of which is the academic information system for Madrasah Aliyah Raudatul Yatama.

Madrasah Aliyah Raudatul Yatama is located at Jl. A. Yani KM 10 Kec. Kertak Hanyar, Kab. Banjar was founded in 1994 and has already graduated hundreds of students. At this time the process of seeking information on Madrasah Aliyah Raudatul Yatama is still carried out by coming directly to the Madrasah.

Based on these problems, an information system is needed to help students find information about Madrasah Aliyah Raudatul Yatama online. The information provided starts from profiles, agendas, news, galleries, announcements, facilities and infrastructure, contacts, and maps. For this reason, researchers used the Heuristic evaluation measurement method and the web usability evaluation tool (Webuse).

This study focuses on the usability of the Madrasah Aliyah Raudatul Yatama Information System website, which aims to obtain an
assessment of each aspect so that it can be further developed in the future.

Problem analysis is the first step in systems analysis (Adiguna et al., 2018). This step is necessary to find out the problems that occur in the operating system.

The user interface is the way users and programs interact with each other. Everything that appears and is visible on the screen is part of the user interface (Alfiansyah et al., 2022). Meanwhile, user experience is the response of users of a system or service. To get a user experience that meets user needs properly, several things must be considered, such as whether the product is easy to use, and how easy it is to understand the information available on the appearance of a product (ISO 9241-210, 2019).

Yahyana and Prehanto (2022) said the user interface and user experience are the important aspects of a system. Even though they are 2 different factors, the user interface (UI) and user experience (UX) are designed as one unit that complements and relates to one another.

The user interface (UI) acts as an intermediary between the user and the application system designed to facilitate use in meeting their needs (David, 2022).

Heuristic evaluation is very well used as a design evaluation technique because it is easier to find or determine the usability problems that arise (Krisnayani et al., 2016). Usability is the extent to which a system is easy to understand, easy to use, and makes users use the system again (Tirtadarma et al., 2018). According to Purnama et al. (2019), there are ten heuristic usability criteria related to website appearance in UI and UX design. The Web Usability Evaluation Tool (Webuse) is a method for identifying good and bad usability problems on various types of websites (Simatupang, et al. 2022).

Chiew and Salim (2003), divided usability categories in the Webuse method based on usability evaluation criteria, content, organization and readability, navigation and links, user interface design, performance, and effectiveness.

Previous studies related to this research were research by Putra (2014) entitled usability website repository analysis of the ten November Surabaya institute of technology library. Using Nielsen's heuristic evaluation, concluded that of the 10 indicators, there is an average value of 3.51 which if rounded to a value of 4 means it is included in a high score, meaning that the Surabaya Sepuluh Nopember Institute of Technology Library website is easy to use.

The second study by Cikadiwa et al. (2017) entitled usability analysis using heuristic methods on the mulawarman university student academic portal which in his research used Nielsen's Heuristic evaluation method.

Darmawan (2021) with his research entitled user interface and user experience analysis on the siatma website using the Heuristic evaluation method and system usability scale, using the Heuristic evaluation (HE) and system usability scale (SUS) methods.

The next related research is research by Respati and Sensuse (2021) entitled interface evaluation of the service home application prototype with the heuristic evaluation method.

Then research by Haniva et al. (2023), with the title user experience analysis on the UPT-TIK Website at Singaperbangsa Karawang University using the heuristic evaluation method.

Materials and Methods
Software Requirements
Software is a very important tool in computing because software contains programs whose instructions are used to operate computer systems (Jamaludin et al., 2021). The software used to create this website is as follows Windows 10, Adobe XD, SublimeText 3, Xampp v3.2.4, Adobe Photoshop, Mozilla Firefox

Hardware Requirements
This section describes the hardware used to create/build a web-based information system. The hardware used to make this system are Processor Intel Core I3-7020 CPU @ 2.30GHz, Hard drive: 239 GB Samsung SSD, Memory: 8 GB, Motherboard: Lenovo LVNB 161216, Monitors: LG 16”, Keyboard: Standard Laptop, Mouse: Standard Laptop.
Wireframe Design
On this page, there are several menu that can be accessed such as gallery, agenda, news, and contact us, as in figure 1.

Figure 1. Wireframe Design

Results and Discussion
Problem Analysis
After conducting an interview head of Madrasah Aliyah Raudatul Yatama, that in promotions his school still uses offline media. The offline media in question is promotions that still use banners and word-of-mouth promotions. Thus the decision was made to create an information systems website. The information system website helps teachers make it easier for students to find information available at Madrasah Aliyah Raudatul Yatama.

Interface Development
Based on the results of descriptive statistical analysis and user interface design and evaluation of usability using the heuristic evaluation method and the results of evaluation of website usability tools, it was determined that of the three variables, it was found that with consideration of ISO 13407 Madrasah Aliyah Raudatul Yatama information systems requires an interface design. The following is a design that has been made simply using the HTML programming language.

Home page
This page is the main page view when opening the application, as shown in figure 2.

Data Collection With Questionnaires
The questionnaire is a tool used to collect information and experimental results on user interface design and the usability of the Madrasah Aliyah Raudatul Yatama Information System. In general, the questionnaire consists of several statements that express an assessment of the quality and user-friendliness of the user interface design of this web-based information system. When creating this questionnaire, reference was made to a sample heuristic evaluation and usability evaluation questionnaire with the ISO 13407 standard. The questionnaire was used to determine user satisfaction with the user interface based on experience and use of the information
system of Madrasa Aliyah Raudatul Yatama. It satisfies the UI and UX, and usability goals well.

**Heuristic Evaluation Parameter Analysis**

The percentage of the questionnaire assessment can be seen in table 1 and table 2. Meanwhile, the display rating scale is shown in table 3.

**Table 1. Percentage of Questionnaire Assessment**

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>24</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>16</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>7.75</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>16</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>7.75</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>12</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>7.5</td>
</tr>
<tr>
<td>5</td>
<td>Flexibility and efficiency of use</td>
<td>20</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>3</td>
<td>3.25</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>20</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>2.75</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>12</td>
<td>9</td>
<td>2</td>
<td>2</td>
<td>6.25</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>16</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>7.75</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>68</td>
<td></td>
<td></td>
<td></td>
<td>68</td>
</tr>
</tbody>
</table>

**Table 2. Percentage of Advanced Questionnaire Assessment**

<table>
<thead>
<tr>
<th>No.</th>
<th>Criteria</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>16</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>7.75</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>4</td>
<td>21</td>
<td>2</td>
<td>0</td>
<td>6.75</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>16</td>
<td>15</td>
<td>0</td>
<td>0</td>
<td>7.75</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>12</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>7.5</td>
</tr>
<tr>
<td>5</td>
<td>Aesthetic and minimalist design</td>
<td>24</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>8.25</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>2</td>
<td>3.5</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>12</td>
<td>18</td>
<td>2</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>0</td>
<td>9</td>
<td>10</td>
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<td>5</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>3</td>
<td>3.25</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>8</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>6.5</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>62</td>
<td></td>
<td></td>
<td></td>
<td>64.25</td>
</tr>
</tbody>
</table>

**Table 3. Percentage of Questionnaire Assessment**

From the score calculation total in table 3, it can be calculated the value of the Madrasah Aliyah Raudatul Yatama Information System by adding up the score from each aspect obtained and dividing it by the maximum result value, obtaining a user interface and usability score using the % index formula:

\[
\text{Percentage} = \frac{\text{Results obtained}}{\text{Maximum Results}} \times 100\%
\]

\[
\frac{31 + 28 + 40 + 31 + 40 + 36 + 34 + 38 + 21 + 14}{800} \times 100\% = \frac{313}{800} \times 100\% = 39.125 \text{ (Normal)}
\]

By comparing this research with previous studies, all studies use the Heuristic Evaluation method in analyzing UI/UX with different evaluation.
objects. However, this study is the only one that provides an assessment based on the ISO 13407 standard.

Table 3. Display Question Rating Scale

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Question</th>
<th>Scoring Scale</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
</table>
| Causality       | Is there a sign when a page change occurs?                                | 0 2 6 1 1     | 31    | Index % = \(\frac{29.5}{50} \times 100\)  
|                 | Is there a sign when an error changes?                                   | 0 2 8 0 0     | 28    | Index % = 59 % 
|                 |                                                                           |               |       | (Just normal) |
| Visible         | Does each menu have the function required by the user?                   | 0 0 1 8 1     | 40    | Index % = \(\frac{35.5}{50} \times 100\)  
| Constraints     |                                                                         |               |       | Index % = 71 % 
|                 | Is there a new interface that makes it easier for users to use the Madrasah Aliyah Raudatul Yatama Information System? | 0 1 7 2 0     | 31    | (Interesting) |
| Mapping         | Does the menu layout suit the user's needs?                              | 0 0 1 8 1     | 40    | Index % = \(\frac{38}{50} \times 100\)  
|                 | Does the overall layout of the Madrasah Aliyah Raudatul Yatama Information System allow users to take quick actions? | 0 0 4 6 0     | 36    | Index % = 76 % 
|                 |                                                                           |               |       | (Interesting) |
| Transfer        | Is there an effect when turning the page that clearly shows the action?   | 0 0 6 4 0     | 34    | Index % = \(\frac{36}{50} \times 100\)  
| Effects         | Does the Madrasah Aliyah Raudatul Yatama Information System meet user needs like interactive websites in general? | 0 0 2 8 0     | 38    | Index % = 72 % 
| Population      | Can the display change according to user needs? (such as zoom, or color change when night time) | 3 5 1 0 1     | 21    | Index % = \(\frac{17.5}{50} \times 100\)  
| Stereotypes     | Are there some display options that don't work on the Madrasah Aliyah Raudatul Yatama Information System | 6 4 0 0 0     | 14    | Index % = 35 % 
|                 |                                                                           |               |       | (Less attractive) |

**Conclusion**

Based on the research results obtained, the researcher can draw the conclusions, Using *The Heuristic Evaluation Method*, based on the calculation results of the questionnaire data with an assessment of the aspects of flexibility and efficiency of use, an overall score of 68 is obtained, which means that the Heuristic Evaluation criteria have a good value or very fulfill the criteria. Likewise the Heuristic Evaluation criteria from the aspect of aesthetic and minimalist design, the value really fulfills the criteria, at 64.25. By using the web usability evaluation tool (WEBUSE) method based on ISO 13407, the initial results obtained were that the percentage of 39.12% was in the Average category. With an assessment of 1 ISO criteria which results in a Less Attractive category and 1 ISO criteria with the Average category and 3 Interesting criteria. This means that the Madrasah Aliyah Raudatul Yatama Information System requires changes in terms of appearance and its use as a student interactive website.

**Compliance with ethical standards**

**Conflict of interest**

The authors declare that they have no conflict of interest.
References


Atma Jaya, Yogyakarta.

