Design and Build an Application for Psychology E-Counseling Services for Website-Based Students with the Prototype Method
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Abstract— The role of the University as an institution of higher education and research, besides that the reason for the importance of psychological counseling services on campus aims to support students achieve academic success, psychological health, along with social and emotional well-being. Psychological counseling is important for students to understand their own behavior, emotions, and ideas. This is because students who have an interest in doing psychological counseling with counselors encounter problems in making appointments, which is that the counseling scheduling system is still done manually. Therefore, by implementing the Psychological E-Counseling system to support student activities or needs in making appointments on campus to make easier, more effective, faster, and facilitate psychological counseling services online and offline by utilizing the use of website applications. The final results obtained from this application research are using black box testing techniques to test the system built to run according to the design and as support the success of the application to make easier for Esa Unggul students who want psychological counseling, the Admin, and Counselors in serving counseling activities.

Keyword— Applications, Counseling, Psychology, Black box, Website

Kata Kunci— Aplikasi, Konseling, Psikologi, Black box, Website

I. INTRODUCTION

Information Technology is a technology used to process data, including processing, obtaining, compiling, storing, manipulating data in various ways to produce quality information, namely information that is relevant, accurate, and timely, which is used for personal, business, and government and is strategic information for decision-making [1].

In an effort to reduce the number of positive cases of the COVID-19 virus since the beginning of the pandemic in 2020 and emphasize the rate of its spread, various types of community work (such as shopping, studying, and working) are temporarily changing from offline to online, where this is one aspect of the activities that affected by this pandemic, so that resulting in an accelerated increase in digital technology that has emerged among the public. One of them is in the field of education at universities that provide psychological counseling services, where all students are required to be counseled from home via online with synchronous counseling that can communicate in two directions directly. Website application is an information system that supports user interaction through a website-based interface. Website application features are usually in the form of data persistence, support for transactions, and dynamic website page composition which can be considered as hybridization and information systems [2].

Therefore, by implementing a Psychology E-Counseling System to support student activities or needs in making appointments on campus to make it easier, more effective, faster, and facilitate psychological counseling services online and offline by utilizing the use of website applications. Because the Website Application can be a solution, where the Website is one of the media for delivering information and publications that are easily accessible from anywhere [3]. From this opinion, it can be concluded that the website is a service that is connected to the internet to interact easily between counselors and students, as well as a system for disseminating information via the internet. This is
because students who have an interest in doing psychological counseling with counselors encounter problems in making appointments, which is that the counseling scheduling system is still done manually. So this is a lot of time consuming and the submission is less informative.

Based on the description that has been described above, the final results obtained through this website application are using black box testing techniques to test the system that is built running according to the design and as a supporter of the success of the application to facilitate students who want psychological counseling, the Admin and Counselors in serving activities counseling. The author is interested and provides a solution entitled “Design and Build an Application for Psychology E-Counseling Services for Website-Based Students with the Prototype Method”. The development system used is the ReactJS framework, which is a JavaScript library developed by Facebook to facilitate the creation of interactive, stateful, and easy-to-reuse interface components. ReactJS is especially suitable for rendering complex interfaces with high performance [4].

II. RESEARCH METHODOLOGY

The framework of thinking is a conceptual model of how the theory relates to various factors that have previously been identified as an important problem [5]. In this research, a problem that has been identified, can be described and analyzed as follows, which is formulated in the framework of thinking below:

1. Data Collection Techniques

A. Interview

An interview is a conversation to gather useful information when the research topic relates to issues that require complex questions and considerable investigation.

B. Study of literature

Literature study is a data collection method by looking for theoretical references that are relevant to research or known problems, and sourced from books, journals, articles, and other references. This is done by reading, taking notes, and processing research materials.

C. Questionnaire

Questionnaire is a research tool that displays a series of questions that are used to collect information about a particular topic sourced from several respondents via Google Form. The main purpose of the questionnaire is to find out the answer data from respondents related to research in the form of opinions or interests.

2. Systems Development Method

The method used in the development of this system is the Prototype method which aims to evaluate an idea. This refers to the creation of a software application that displays the functionality of the product and is under development. This prototype method can provide opportunities for developers and research objects to interact with each other during the system design process [6]. Here are the stages of the prototype method:

A. Listen to Customer

In this stage, identification of software and analysis of user needs is carried out before making a prototype design for the E-Counseling Service Application.

B. Build/Revise Mock-up

In this stage, after all have known what the needs have been described in the previous stage, the next
step in designing is making a prototype design and improving the prototype, so that it can adjust and design temporarily that focuses on the program flow to the user.

C. Customer Test Drives Mock-up

In this stage, if the prototype design that has been approved will be translated into the appropriate programming language and the coding that has been made will enter the testing process, whether it can run well or find some parts that need to be repaired or there are parts that are not suitable with user needs. This is done to evaluate the system or software that has been completed, whether it is in accordance with the user's needs or not. If the user feels that it is not appropriate or not as expected, the system will be repaired and returned to the Designing and Repairing Prototype stage.

III. RESULTS AND DISCUSSION

In problem analysis, what must be done first is to identify a problem that occurs.

1. Problem Analysis

Based on the results of interviews conducted with related parties, problems in psychological counseling services have been obtained which will be used as the basis for proposals for the Application of Psychology E-Counseling Services, so that the results can be described in a fishbone diagram as follows:

From the fishbone diagram above, it can be explained the following problems:

1) There are obstacles in making appointments, namely the counseling scheduling system is still being done manually so that interested students must come directly to the campus location to make an appointment. (before the pandemic)
2) Filling out the counseling appointment form is currently done via text message on the WhatsApp application, which is time consuming and the submission is less informative. (during the pandemic)
3) Students who have made an appointment, must confirm back with the admin to choose a counseling day and a list of counselors.

4) There is no Website Application as a supporter and to help facilitate Psychology admins, counselors and students for Psychological Counseling Services.

These UML (Unified Modeling Language) tools are used to design the system and analyze problems using fishbone [7].

2. Use Case Diagram, Activity Diagram, and Class Diagram

A. Use Case Diagram

Use case diagrams are used to show the process of activities sequentially in the system being built, and as a bridge between the developer and the user to describe a system. At the needs analysis stage, it is necessary to identify needs on a website-based application. This Psychology E-Counseling Service application has 3 users, namely Admin, Student, and Counselor. The following is a use case diagram of the Psychology E-Counseling Service System:

B. Activity Diagram

Activity diagrams are used to describe business processes or workflows in a system that will be run on a Website- Based Psychology E-Counseling Service Application. The following is an activity diagram of the proposed Psychology E-Counseling Service activities:
C. Class Diagram

This class diagram illustrates the static appearance of a website application. It represents the types of objects that reside in the system and the relationships among their users.

3. Students Website User Interface

A. Home Page

From the problems that have been identified and analyzed from user needs, then the following are the results of the implementation or user interface of the Psychology E-Counseling Service Application:

On the Home page, there is a start counseling button which will go to Google Meet for counseling sessions and if students have received a counseling link from the admin. Then there is information
regarding the discussion of psychological counseling, and information about what this website application can do. Then students can enter or register if they have not registered for counseling appointments before. If a student immediately chooses to make an appointment before logging in to the website, a popup will appear in the form of a warning “Harap login sebelum membuat janji”.

B. About us Page

The about us page contains information about the Psychology E-Counseling Service provided by the Psychology Faculty of Esa Unggul University. For more information, students can visit the button in the “Kunjungi Kami” section which will go to the campus website link for the Faculty of Psychology. Then, there is a contact us button on every website page.

C. Login or Register Page

On the login or register page, where students who have registered or already have an account on the psychological counseling service website can directly enter to make a counseling appointment. If students have never registered before, they are required to register first by entering their name, NIM, and password. After completing the account registration, a popup “Register Berhasil” will appear.

D. Dashboard Page

After the student has successfully logged in, then enter the student dashboard page, where there are notification navigations, counseling schedules and counseling history. On the dashboard with the status waiting to be confirmed by the admin to be accepted, rejected, or rescheduled, and there is an icon for rescheduling that appears, this is when students change their minds or there are unexpected things they are forced to reschedule their counseling sessions.

E. Counselor Choice Page

To be able to make a counseling appointment, students must enter the Buat Janji navigation, then choose a counselor according to the problem to be counseled first or the choice according to the student’s wishes.
F. Registration Form Page

After the student has chosen a counselor, the student will then enter the display in the form of a registration form for a counseling appointment that must be filled out by the student, in the form of personal data and the problem to be counseled. However, when a student does not fill in the counseling form and immediately makes an appointment, there will be a popup warning "please complete the form". When the student has finished filling out all the questions in the form provided, there will be a confirmation popup again for the student, if it is appropriate then the schedule for the counseling appointment has been successfully made.

G. Counseling History Page

After the counseling session has been completed and the admin has confirmed it is complete, all completed counseling activities go to the counseling history page.

H. Notification Page

Students will get a notification that must be filled in in the form of an assessment for the counselor who handles it after the counseling session is over.

I. Satisfaction Rating Page

After the student presses the assessment notification, an assessment popup appears in the form of a star and information on the counselor who handled it the last time for counseling, students are required to provide a satisfaction assessment to the counselor which will be used for evaluation after counseling. When finished, there will be a popup information "Penilaian Berhasil".

J. Contact us Page

If students have problems, they can contact the admin on the contact us icon button, where this live chat is directly connected to WhatsApp admin.
4. **Admin and Counselor Website User Interface**

**A. Home Page**
On the admin website interface, before the admin or counselor can access the counseling system menu, they are required to login first.

**B. Dashboard Page**
Admins who successfully log in, then go directly to the user dashboard, which contains the daily, weekly, and yearly totals of the counseling students. In addition, there is a graph of the total number of students who were counseling on currently month and a graph of the problems that were most counseled, counselors can also view this dashboard.

**C. Counseling Management Page**
On the counseling management page, there is data on student counseling requests with pending status. Admin can accept, reject, and reschedule after entering the Lihat Detail page.

**D. Detail Page**
In the detail page of student counseling request data, there is the identity of the client and the problem to be counseled. Then, on this page, the admin can accept, reject, reschedule, and confirm that the counseling is complete. Each of the buttons has a different form.

**E. Form Page**
Each button has a different popup form, there is a form to receive counseling, a reason for refusal form, and a form to reschedule which will be sent directly to the student’s email.
Figure 23. Form Popup

**F. Counseling History Page (Admin)**

All student counseling statuses that have been completed and rejected by the admin are entered into the counseling history.

Figure 24. Counseling History Page (Admin)

**G. Counselor Data Page**

On the counselor data page there is a list of counselor information in the form of available time, counselor's name, title, area of expertise, and the number of clients who have been handled by the counselor. In addition, admin can add new counselor data.

Figure 25. Counselor Data Page

**H. Counseling History Page (Konselor)**

There are differences in admin and counselor logins, counselors can only view the dashboard and counseling history for the benefit of student counseling data recap.

Figure 26. Counseling History Page (Konselor)

**I. Counseling History Details Page**

In the details of the counseling history, each counselor can only see the counseling history and satisfaction assessment of the clients she handled previously, but can not see the assessments of other counselors.

Figure 27. Counseling History Page

**5. Black box Testing**

In this application testing stage, namely the black box testing technique, it is necessary to examine the application being tested from the user's point of view, and is used to test the system against external factors that are responsible for software failure. This testing approach focuses on the inputs that go into the software, and the resulting outputs. The following is a table of black box results:

<table>
<thead>
<tr>
<th>No</th>
<th>Testing</th>
<th>Test Case</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Home Page</td>
<td>1. Login Login Button</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>2</td>
<td>Register</td>
<td>1. Fill Form Regist Button</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>3</td>
<td>Login</td>
<td>1. Login 2. Fill Form Login Form</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>4</td>
<td>Dashboard</td>
<td>1. Buat Janji Button 2. Icon Logout Button</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>5</td>
<td>Buat Janji Page</td>
<td>1. Counselor Icon Next Button</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>6</td>
<td>Regist Form</td>
<td>1. Fill Form 2. Buat Janji Button Popup</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>7</td>
<td>Admin Contact</td>
<td>1. Contact us Icon</td>
<td>SUITABLE</td>
</tr>
</tbody>
</table>

TABLE I BLACK BOX TESTING RESULTS FOR STUDENTS WEBSITE
Based on the results of research that has been carried out, that the Website-Based Psychological E-Counseling Service Application for Students can help make it easier for students to make counseling appointments, as well as related parties, namely Admin and Counselors in serving counseling activities offline and online more easily, effectively, and fast. With this application, students no longer need to make appointments via private chat with the admin on the WhatsApp application or come to campus, and admins also no longer need to provide an appointment form via paper or manually which will minimize time in scheduling. Based on Black box testing, the website also displays results that are as expected.

The suggestions that can be re-developed in this application for further research, include:
1) Developing the addition of a live chat feature with the admin on the website.
2) Developing additional online call counseling features on the website, so admins don’t need to provide Google Meet or Zoom links for counseling sessions.

3) Doing development for platforms such as android mobile and iOS, so that it can make more easier for clients or students easily through mobile apps.

### IV. CONCLUSION

<table>
<thead>
<tr>
<th>No</th>
<th>Testing</th>
<th>Test Case</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Home Page (Admin)</td>
<td>1. Login Button</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>2</td>
<td>Login</td>
<td>1. Fill in Login Form 2. Login Button</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>5</td>
<td>Counseling History (Admin)</td>
<td>1. Search Filter 2. Lihat Detail Button</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>6</td>
<td>Counselor Data</td>
<td>1. Tombol Tambah Konselor 2. Lihat Detail Button 3. Popup Form</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>7</td>
<td>Home Page (Counselor)</td>
<td>1. Login Button</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>8</td>
<td>Login</td>
<td>1. Counselor Login Form 2. Login Button</td>
<td>SUITABLE</td>
</tr>
<tr>
<td>10</td>
<td>Counseling History (Counselor)</td>
<td>1. Search Filter 2. Lihat Detail Button</td>
<td>SUITABLE</td>
</tr>
</tbody>
</table>

### TABLE II
BLACK BOX TESTING RESULTS FOR ADMIN WEBSITE

### REFERENCE


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