



**DEVELOPMENT OF ONLINE COUNSELING WEB-BASED
APPLICATION FOR HEALING MENTAL HEALTH ISSUE USING WEB
REAL-TIME COMMUNICATION**

Final Year Project Report

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DEPARTMENT OF INFORMATICS
FACULTY OF COMPUTER SCIENCE
UNIVERSITAS MERCU BUANA

JAKARTA
2021



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Submitted to Complete Terms
Completed a Computer Bachelor Degree

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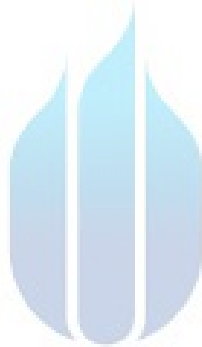
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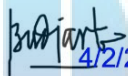
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Thesis Title : Development of Online Counseling Web-Based
Application for Healing Mental Health Issue using
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This Thesis has been checked and examined as one of the requirement to obtain a Bachelor's Degree in the Informatics Engineering Study Program, Faculty of Computer Science, Universitas Mercu Buana.

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This Thesis has been examined and tried as one of the requirement to obtain a Bachelor's Degree in the Informatics Engineering Study Program, Faculty of Computer Science, Universitas Mercu Buana.

Jakarta, 19 February 2022

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ABSTRAK

Nama : Riksa Suviana Rochman
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Pembimbing TA : Raka Yusuf ,ST.,MTI
Judul : Development of Online Counseling Web-Based Application for Healing Mental Health Issue using Web Real-time Communication

Seiring dengan meningkatnya jumlah pengguna media sosial, kesehatan mental mempunyai korelasi dengan dampak negatif. Sebagian besar masyarakat Indonesia tidak pernah menganggap masalah kesehatan jiwa sebagai masalah serius karena kurangnya pemahaman tentang masalah tersebut dan biaya pengobatan yang mahal. Dengan teknologi, konseling dapat dilakukan dengan mudah menggunakan komputer atau telepon tanpa mengeluarkan uang untuk itu. Dalam penelitian ini penulis mencoba mengembangkan aplikasi web yang mendorong klien dan konselor untuk saling bertatap muka dan mengobrol menggunakan websocket komunikasi real-time. Aplikasi web konseling ini berjalan dengan baik sesuai dengan pengujian black box dan dapat digunakan untuk klien dan konselor.

Kata kunci:

web application, real-time communication, websocket, mental health, counseling



ABSTRACT

Name : Riksa Suviana Rochman
Student Number : 41518010189
Counsellor : Raka Yusuf ,ST.,MTI
Title : Development of Online Counseling Web-Based
Application for Healing Mental Health Issue using
Web Real-time Communication

Along with the rising amount of social media users, mental health has become a trade-off negative impact correlation. Most Indonesians have never considered Mental health issues as a serious problem due to lack of understanding of the issue and expensive treatment. With technology, counseling can be performed easily using a computer or phone without spending any money on it. In this research the author tried to develop web applications that encourage clients and counselors to face each other and chat using real-time communication websocket. This counseling web application runs well according to black box testing and can be used for clients and counselors.

Key words:

web application, real-time communication, websocket, mental health, counseling



PREFACE

Praise be given to God Almighty who has given His grace and guidance, so as to complete this thesis report as for completing the Bachelor Degree in Informatics Engineering at Universitas Mercu Buana. Author is fully aware in making this thesis report can't be done without any supports, thus i'd like to express my gratitudes to:

1. Yaya Sudarya Triana, M.Kom., Ph.D. as Dean of Faculty of Computer Science, Universitas Mercu Buana.
2. Emil R. Kaburuan, Ph.D., as Head of Department of Informatics Engineering, Universitas Mercu Buana.
3. Anis Cherid, SE, MTI, as Head of International Department of Informatics Engineering, Universitas Mercu Buana.
4. Prastika Indriyanti S.Kom, MCS as Academic Supervisor.
5. Raka Yusuf ,ST.,MTI as Thesis Supervisor.
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8. Both parents always provide prayer and support.
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The author realizes that there are still many shortcomings in this report, both in terms of material and presentation techniques, given the lack of knowledge and experience. Therefore, constructive criticism and suggestions are expected.

Finally, I hope that this report will be of use to other parties someday.

Bandung, 3rd January 2022



Riksa Suviana Rochman

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JOURNAL SCRIPT

1. Introduction

In this modern technology era, most people are using the internet regardless of their age. Based on research by Datareportal as of January 2021 [14], shows there were 170 million social media users in Indonesia which was equivalent to 61.8% of total Indonesia population in January 2021. Aligned with increasing social media usage, there is another trade-off negative impact which is increasingly of Mental Health Issue. Studies reported that excessive use of social media has been found to be correlated with physical appearance anxiety and body dissatisfaction [5].

Research about mental health issues in Indonesia has been done by Kementerian Kesehatan Republik Indonesia, In 2018 prevalence of depression symptoms at age 15 and above, shows only 9% of them get proper treatment and the rest of this number which is 91% never get any treatment at all. This huge number indicates that Indonesia has no proper support facility that could fit the patient. There are several services providing online counseling such as Riliv and Get-Kalm, the problem is they are all paid and relatively expensive to get a treatment.

Hence, the author is interested in pumping the number of 9% by developing a new website application which will be helping the clients to get a proper treatment using different solutions compared to other online counseling services. Providing free online counseling could be a solution for teenagers to afford the treatment, the user experience will be easier for users to get a treatment without entering their real name to guarantee user's privacy and anonymity [15]. There will be a client and counselor role in this website, in which case only certain people who can prove their skill in counseling will be able to register as counselors. Recruiting some social welfare college students as counselors is the author's business plan, as well as utilizing advertisement as a revenue stream instead of paying for every counseling. Using web real-time communication is essential since the author is going to build an online counseling with chat feature [7]. Therefore, the author is going to do research for the development of online counseling web applications by utilizing web real-time communication using Websocket [8]. Using the Go Programming

language is beneficial for this research due to its own performance compared to other programming languages, this can be useful for web scalability [6]. As the web grows bigger, storing data vertically especially for chat needs a proper DBMS to minimize the query time, which the author will use MongoDB as NoSQL database [9].

Based on the background and problem addressed above, the author found related research using the same methodology which was titled “Financial stock application using websocket in real time application” [1] which talked about Application to watch Stock in real time. Because this research is using the same method and technology, this research is going to be using that research as the main reference.

2. Method

2. 1. WebSocket

Websockets are HTTP (Hypertext Transfer Protocol) data exchange methods or web trafficking where the websockets method utilizes the request and response method from HTTP in general but client-side requests to open open-connection status with the server so that the server and client can communicate and exchange two-way data when there is new data available in real time without repeating the entire HTTP protocol [11]. In this research, WebSocket is useful to build a chat feature due to real time behaviour in exchanging two-way data.

2. 2. Software Development Method

Initial steps in making this project is collecting data about the percentage number of mental health issues in Indonesia. Since this project is going to develop social media-like, then consider how technology can affect mental health especially in social media. This research is using Agile Software Development Life Cycle, which consists of 5 steps as below.

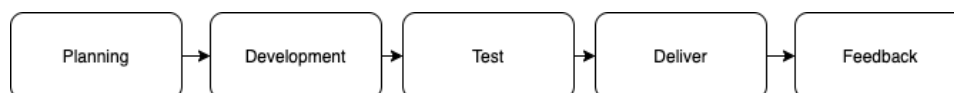


Fig. 1. Agile Software Development Life Cycle

Agile Software Development is often presented as an alternative to more traditional approaches, such as waterfall, incremental, or evolutionary, in which predictability, extensive planning, codified processes and rigorous reuse are the key elements for the efficient development of software [11].

2. 3. Requirement Analysis

The problem the author encounters is that there are still a lot of Indonesians who have mental issues and never have any treatment at all, instead they often self-diagnose. This number is rising each year which means there is no solution that is scalable enough to drastically decrease the number of Indonesians who have mental issues.

2. 4. Functional Requirement Analysis

The main function solution to overcome the problem in this research are:

- Clients will be able to create a post, so a counselor will reply to the post if they feel capable to handle the client.
- Chat is the main feature where Real-time communication handled by WebSocket. The function is bridging client and counselor in order to resolve the client's issues.

3. Results and Discussion

3.1. System Design

To design the system in this case is going to use UML (Unified Modeling Language), which is an object modeling method. Types of UML Diagrams that are going to be used are Use Case Diagram and Activity Diagram.

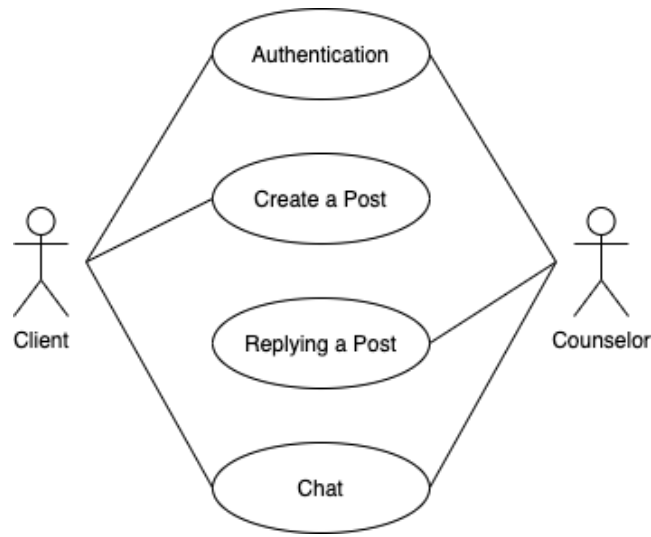


Fig. 2. Use Case Diagram

Use Case Diagram defining the expected result for functionality in a system. A use case represents an interaction of actor and system. Below is a use case of the system. The system application that is going to develop will have features as above. It has Authentication to distinguish the role of client and counselor, creating a post for a client who is seeking help, replying a post for counselor who wants to help, and chatting for both parties to begin the counseling.

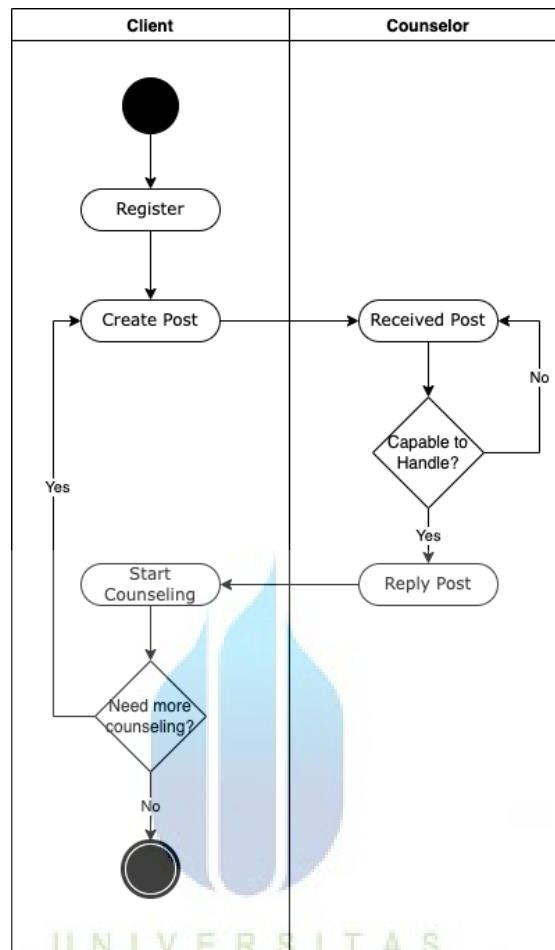


Fig. 3. Activity Diagram

The picture above has explained about activity flow for a system where a client ended up doing counseling with a counselor. Starting with Register, clients could use anonymous nicknames if they want to, so they don't need to worry about privacy.

Every single post client created will show up to the home page, so every user can see the client's stories. If the counselor feels incapable of handling the client, the counselor could decide to skip the post, otherwise the counselor will reply to the post so both parties (client and counselor) will be facing each other in chat.

Counselors don't always come up with texting in chat feature, they could offer a client a video call by sending them a google meet link or even meet up somewhere arranged with the client.

The reason there is no technical indicator to ensure the client's problem is solved is quite difficult for someone (client) to know their problem is solved by only counseling, it needs persistent action from the client and repeated counseling if needed.

3.2. Home User Interface

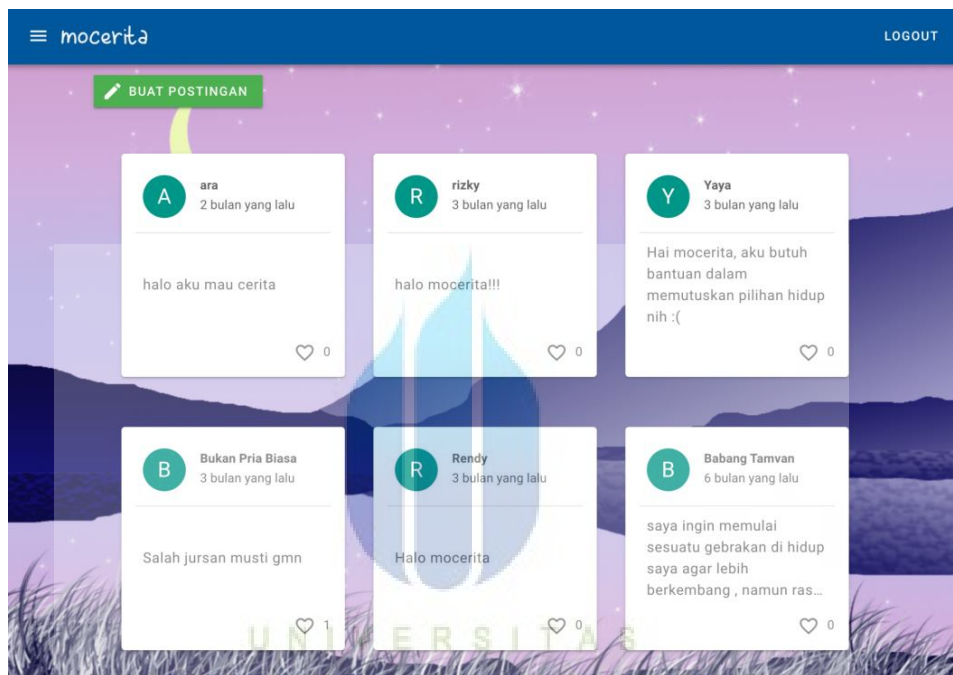


Fig. 4. Home Page

After login success, the user will be redirected to this home page and the user can see what's happening on the timeline. Every post user has made, they don't need to worry about an exposed profile because they have a choice to hide their real name. Users can give a like for a post to support the author of the post.

3.3. Chat User Interface

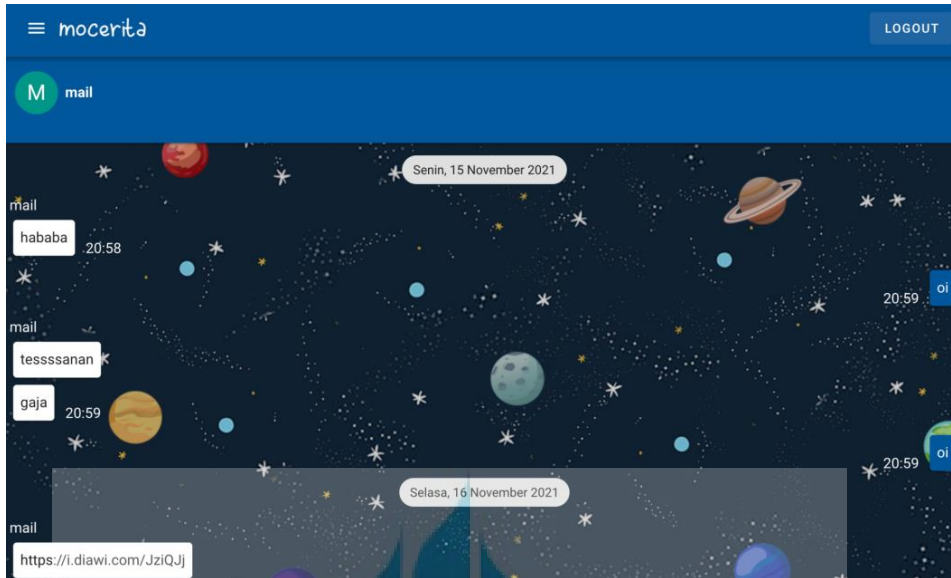


Fig. 5. Chat Page

For every post a user has made, there will be a counselor replying. Right after the counselor replying to the post, there will be a notification. In this page, where real-time communication (WebSocket) is being used. Whenever the user clicks the send chat button which means it will create a WebSocket message and will be sent to the interlocutor where WebSocket is being subscribed.

3.8. Black Box Testing

The test method involves testing a system without knowing prior knowledge of an internal system called Black Box Testing.

Table 2. Black Box Testing

Black Box Testing				
No	Testing Name	Expected Result	Result Obtained	Response Time
1	Login Page	Login button validates credentials from the database and moves the home page.	Positive	232ms

2	Register Page	Register button submit user data to database.	Positive	259ms
3	Home Page	Shows All Post from other users and like buttons can be clicked.	Positive	112ms
4	Create Post Page	Create Post added to the database and show up on Home Page.	Positive	53ms
5	Profile Page	Shows User Identity and Post Histories.	Positive	186ms
6	Chat Page	Can send messages and receive messages through real-time to specific users.	Positive	32ms

As a result, Black Box Testing has been executed to discover the reliability of the software by checking on existing buttons through the scenario in the table. Response time shows an average of API Response Time on every page. In addition, this software has been used by some real clients & counselors, in which from a total of 92 clients, 44 of them have told their story using a post feature, and then many counselors replied to them. This actively demonstrates that the testing has been successfully done.

4. Conclusion

Based on the research and development of online counseling web-based above, it can be concluded that this application is developed for any platform that can access web such as computers or phones. The application has already been tested and works properly according to black-box testing and users already use it to reach their needs by using a posting feature and chat feature with a counselor. Author collaborated with Himpunan Mahasiswa Kesejahteraan Sosial FISIP Unpad Periode 2020-2021 Kabinet Sandyavera in order to deliver the product by supplying up counselors.

WORKING PAPER

This working paper is a complete material for a journal titled “Development of Online Counseling Web-Based Application for Healing Mental Health Issue using Web Real-time Communication”. Working paper contains all the material for the results of the Journal that are not included in the Journal. This working paper provided literature review, analysis and system design, database design, source code, and complete experiment result.

Chapter 1 contains a Literature Review which reviews supporting papers that are related to this paper. Chapter 2 contains an Analysis and System Design that will cover an outline of the whole system using Use Case Diagram and Activity Diagram. Chapter 3 shows Source Code for Back-end Golang and Front-end VueJS at Register, Login and Create a Post feature. Chapter 4 explains Database Design which is going to be used as a main system. Chapter 5 describes experiment stages in 5 steps. Lastly, chapter 6 shows the results of the research using screenshots.

