

Original Article

Mental Health Website With Self-Assessment and NLP Chatbot

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Abstract

This study implemented a web-based mental health service platform that integrates self-assessment, an NLP-based chatbot, and centralized data storage for a mental health clinic in Pasar Kemis, Tangerang, Banten. The research addressed manual recording, limited early-screening access, service delays, and the absence of an integrated mechanism for receiving complaints and scheduling counseling. The system was developed through observation, interviews, literature study, database design, interface design, implementation, and system testing. The website provides user registration, screening, chatbot consultation, educational articles, counseling booking, and administrative management of users, schedules, assessments, and chat logs. The implemented system stores self-assessment results, chatbot interaction history, and user profiles in a structured database to support more organized service workflows. Testing and user feedback reported in the study indicate that the system functions as expected and is positively received in terms of usability, accessibility, and chatbot usefulness. The study concludes that the proposed platform can improve the efficiency, structure, and accessibility of early mental health services.

Keywords: Digital screening, Mental health services, Chatbot, Database integration, Web system

Introduction

Mental health has become an increasingly important issue in the digital era because social, academic, and occupational pressures continue to affect psychological well-being [7], [19]. The study explains that access to mental health services remains limited, relatively expensive, and often constrained by stigma, which prevents many people from seeking help early [9], [19]. In Indonesia, many individuals still hesitate to visit mental health facilities because of embarrassment, fear of judgment, or limited understanding that initial screening can be performed independently [14]. These conditions indicate the need for accessible and user-friendly digital services that can reduce barriers to early mental health support [18].

The study positions self-assessment and chatbot technology as practical responses to these challenges. Digital self-assessment allows users to carry out initial screening independently, privately, and more conveniently [24], [26], while chatbot systems based on Natural Language Processing can serve as an initial conversational layer for receiving complaints, directing users to screening instruments, and providing educational responses [10], [25]. Previous studies cited in the study show that digital mental health support has already been implemented in various forms [9], [18], but many solutions remain fragmented, platform-specific, or not fully integrated with



clinic-centered management [10]. This makes centralized service coordination difficult, especially for clinics that still depend on manual workflows.

The study was conducted using a mental health clinic in Kecamatan Pasar Kemis, Kabupaten Tangerang, Banten, as a case study. Field observations identified several operational constraints, including limited consultation time, long queues, and the absence of a digital system that could receive counseling requests online. Early screening and complaint submission had not yet been fully supported by a unified service environment. This situation motivated the development of a web-based system that could support public users and clinic administrators through one integrated platform [1], [22]. The research gap addressed by this study is the limited availability of integrated web-based mental health systems that combine self-assessment, chatbot-based early interaction, educational content, consultation scheduling, and structured patient data management in one environment.

The main contribution of the research is a clinic-oriented digital service model that connects early screening, conversational support, and administrative management in a single information system.

Methods

The study describes this research as a system development study focused on implementing a mental health service website for a clinic case study [1], [22]. Data collection was conducted through observation, interviews, and literature review [15], [27]. Observation was used to identify existing service workflows and operational constraints at the clinic, while interviews were used to gather stakeholder needs regarding the proposed system.

Literature review supported the conceptual foundation for website development, mental health screening, chatbot implementation, database design, and system testing [3], [4], [30]. The system design process included analysis of the running system and the proposed system, database design, UML-based modeling, and user interface design [3], [23], [28]. The database design integrates entities related to users, assessments, questions, answer options, assessment results, chat logs, articles, comments, schedules, and consultations [8]. This design allows the system to maintain structured records for user identity, screening results, conversation history, educational content, and consultation booking. The website functions as the public-facing interface through which users register, log in, access self-assessment instruments, provide additional notes, review assessment results, use chatbot services, read educational articles, and book counseling sessions [1], [22]. The administrative side supports management of users, counselor schedules, consultation bookings, article content, assessment results, and chat logs [13], [16].

The study indicates that the development environment used Flask with Python and MySQL, browser-based access, and Visual Studio Code [12], [20], [21]. The self-assessment process was implemented through selectable mental health instruments and a structured question-and-answer workflow [24], [26]. The database specification shows that the system stores the assessment type, total score, anxiety score, stress score, severity category, additional notes, and creation time. The chatbot component was implemented as an initial service mechanism based on Natural Language Processing [10], [25]. Through this feature, users can submit complaints in conversational form and receive preliminary responses. The stored chat logs, emotion labels, and risk-related fields indicate that the chatbot was intended as a structured mechanism for early interaction capture. The system evaluation in the study consisted of implementation testing and user-oriented evaluation. The testing section includes black-box testing and white-box testing [11], and the implementation chapter presents feature-by-feature system execution. User acceptance is supported by questionnaire data covering interface comprehension, navigation, perceived usefulness, access to mental health services, chatbot ease of use, language clarity, helpfulness of conversation, and satisfaction with the chatbot feature [2], [6].

Table 1 presents the black-box testing results of the proposed system. The results show that all tested features, including login, registration, self-assessment, chatbot interaction, consultation booking, admin dashboard access, and logout, functioned according to the expected outcomes. This indicates that the main user-facing functions of the website operate properly.

Table 1. Table Black-box testing results

Feature	Test Scenario	Expected Result	Conclusion
Login	Username and password are valid	The system opens the dashboard	Valid
Login	Username or password is incorrect	The system rejects the login and shows an error message	Valid
Registration	The form is filled in completely	The account is stored in the database	Valid
Self-assessment	All questions are answered	The screening result is displayed	Valid
Chatbot	A message is sent	The chatbot reply appears	Valid
Consultation booking	A schedule is selected	The booking is saved	Valid
Admin dashboard	The admin logs in	The admin menu is displayed	Valid
Logout	The logout button is clicked	The session ends and returns to the login page	Valid

Table 2 presents the white-box testing results of the proposed system. The test scenarios cover the main internal logic paths of the application, including login validation, self-assessment processing, lifestyle profile input, consultation booking, and chatbot response handling. The results show that each path was executed successfully and produced the expected output, which confirms that the internal program logic works as intended.

Table 2. Table White-box testing results

Feature	Test Scenario	Expected Result	Conclusion
Login	Access the login page using the GET method	The login form is displayed	Valid
Login	Enter incorrect username or password	The system shows an error message and returns to the login page	Valid
Login	Enter correct username and password	The system logs in and redirects to the dashboard	Valid
Self-assessment	Answer the assessment questions completely	The screening result is stored and displayed	Valid
Self-assessment	Enter invalid input data	The system shows a validation error	Valid
Profile lifestyle	Open the profile lifestyle page	The lifestyle form is displayed	Valid
Profile lifestyle	Click save without completing the form	The system shows a validation error	Valid
Profile lifestyle	Fill in sleep hours, stress level, and diet, then save	The data is stored successfully	Valid
Consultation booking	Select an available doctor schedule	The booking is saved with pending status	Valid
Consultation booking	Use an invalid doctor ID	The system shows an error message	Valid
Chatbot	Send a valid text message	The AI chatbot returns a reply	Valid
Chatbot	The API request fails	The system shows a fallback error message	Valid

Table 3 presents the questionnaire results obtained from 66 respondents. The mean scores for all statements range from 4.36 to 4.45 out of 5, showing consistently positive responses toward the website interface and the AI chatbot. This indicates that the system is perceived as easy to use, useful, and helpful for supporting mental health access.

Table 3. Table Questionnaire results

Statement	Mean	SD	N
The website layout is easy to understand when using it for the first time?	4.45	0.71	66
The navigation menu on this website is easy to use?	4.39	0.78	66
I am satisfied with the overall interface design of this website?	4.41	0.70	66
This website helps me understand my mental health condition?	4.39	0.78	66
The features available on this website are useful for me?	4.39	0.70	66
This website makes it easier for me to access mental health services?	4.38	0.80	66
The AI chatbot on this website is easy to use?	4.39	0.72	66
The language used by the AI chatbot is easy to understand?	4.36	0.78	66
Conversation with the AI chatbot feels helpful?	4.36	0.72	66
I am satisfied with the AI chatbot feature on this website?	4.38	0.78	66

Table 4 presents the frequency distribution of respondents' initial answers. The results show that most respondents had previously searched for mental health information, and social media was the most frequently used source. In addition, most respondents had never used online mental health services before, which supports the relevance of developing a web-based mental health platform.

Table 4. Table Respondent frequency results

Question	Answer	Count	Percentage
Have you ever searched for information about mental health?	Yes	41	62.1
Have you ever searched for information about mental health?	No	25	37.9
What is the mental health information source you use most often?	Social media	26	39.4
What is the mental health information source you use most often?	Internet	18	27.3
What is the mental health information source you use most often?	Health workers	11	16.7
What is the mental health information source you use most often?	Family or friends	10	15.2
What is the mental health information source you use most often?	Self-reflection and personal experience	1	1.5
Have you ever used online mental health services before?	No	42	63.6
Have you ever used online mental health services before?	Yes	24	36.4

Figure 1 illustrates the proposed system workflow, starting from user registration and login, followed by account verification, access to the main page and service menu, self-assessment input, schedule submission, and administrative schedule approval. The diagram shows the interaction between the patient, system, and owner roles in the service process.

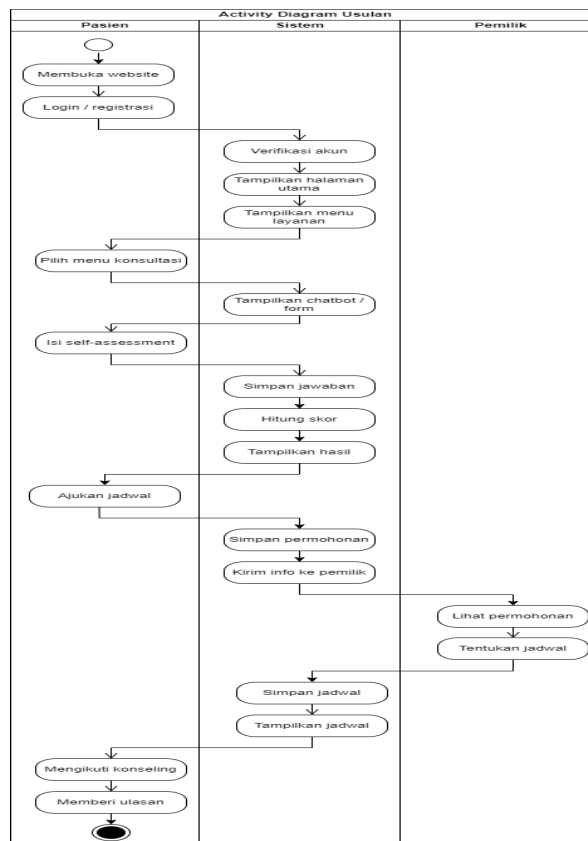


Figure 1. Activity diagram of the proposed system workflow.

Figure 2 shows the use case diagram of the proposed mental health clinic system, where the user can register, log in, access the dashboard, perform assessment and AI chat interaction, read articles, book consultations, and log out, while the admin can manage users, schedules, articles, and chat logs.

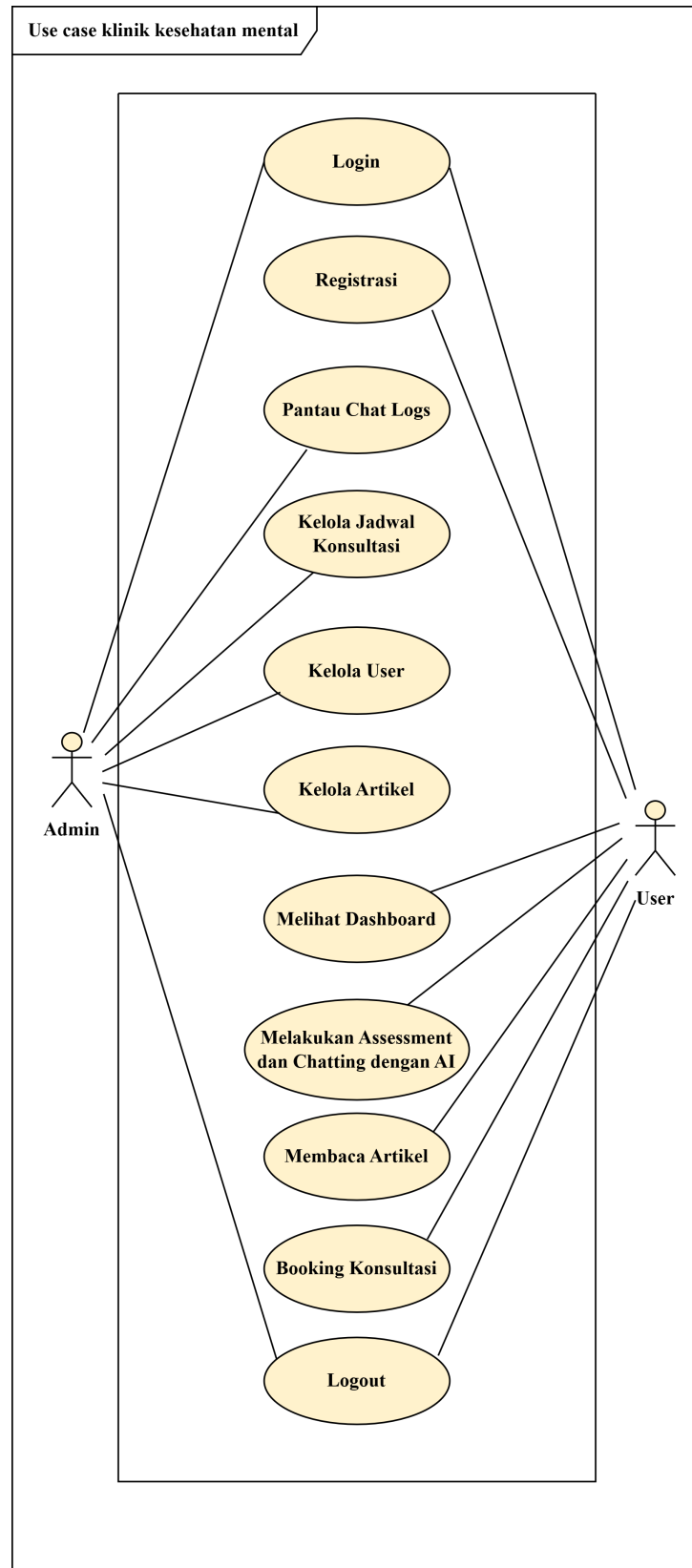


Figure 2. Use case diagram of the mental health clinic system.

Figure 3 illustrates the system architecture of the proposed mental health website, where users and administrators access the system through the web application layer. Requests from both roles are processed by the Flask/Python backend, which manages the core business logic and coordinates the self-assessment, NLP/chatbot, consultation booking, and article modules. All data generated from these modules are stored in the MySQL database to support centralized management, structured records, and consistent service workflows.

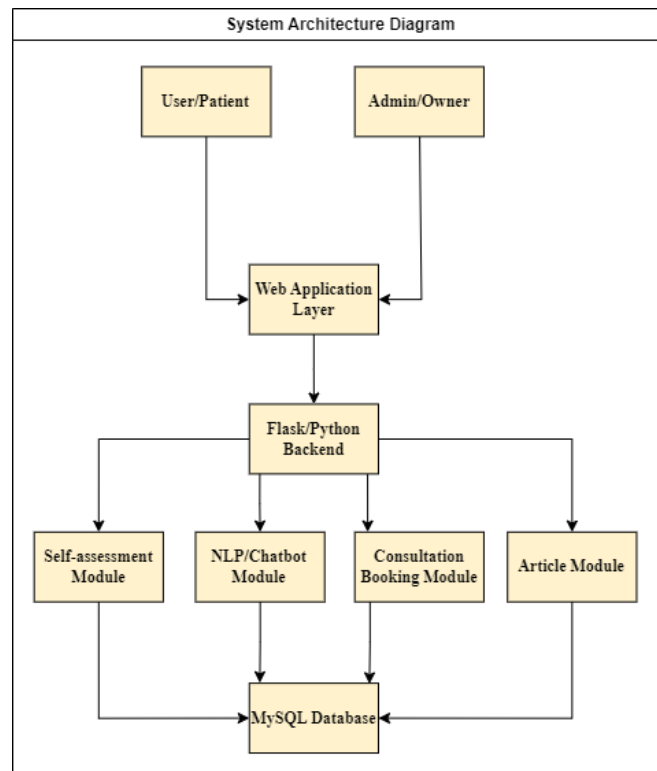


Figure 3. System architecture diagram of the proposed mental health website.



Figure 4. User dashboard interface of the implemented mental health website

Figure 4 presents the main dashboard interface of the mental health website. The screenshot shows the navigation menu, summary cards, and quick access to the core features of the system, namely self-assessment, AI chatbot consultation, emergency support, and educational content. This interface demonstrates that the proposed web application has been successfully implemented and is ready to support user interaction.

Results and Discussions

The study produced a web-based mental health service system that combines public service functions and clinic administration in one platform. The study shows that the system includes a landing page, user registration and login, user dashboard, mental health assessment workflow, additional assessment notes, lifestyle data profile, AI chat consultation, emergency help page, informational pages, counseling schedule page, consultation booking form, educational article pages, user profile pages, and an administrative dashboard. On the administrative side, the system provides interfaces for user management, counselor schedule management, consultation booking management, article management, assessment result access, and chat log monitoring.

The integrated database is one of the main implementation outcomes. According to the study, the database stores self-assessment results, chatbot interactions, educational content, schedules, and consultation records in related tables. This structure directly addresses fragmented records by enabling the clinic to manage patient-related information systematically. The inclusion of severity level, additional notes, conversation metadata, and consultation status suggests that the system supports both data collection and service continuity.

The self-assessment implementation appears to be a core entry point for users. The study indicates that users can select mental health tests, answer assessment questions, provide supplementary notes, and receive result summaries. The database specification refers to test types such as PHQ-9 and DASS-21, as well as categories for severity and supporting lifestyle information. This shows that the system was designed to assist early screening in a structured manner while preserving records in a central database.

The chatbot implementation is presented as an initial service mechanism based on Natural Language Processing. Users can communicate complaints through conversational interaction and receive relevant responses. The stored chat logs, emotion labels, and risk-related fields indicate that the chatbot functions as a structured capture point for early interaction. This is important in clinical service settings because it can lower the barrier for first contact and help users begin the service process more comfortably.

The testing results reported in the study indicate that the implemented features functioned according to expectations. The black-box testing section documents validation of multiple functions, including login, form input, and other operational processes. In addition, the questionnaire results reported in the study show high user acceptance for first-use interface comprehension, navigation, overall interface satisfaction, usefulness of the system, ease of access to mental health services, ease of chatbot use, clarity of chatbot language, helpfulness of chatbot conversation, and satisfaction with the chatbot feature. The questionnaire values reported in the study include 90.9% for interface comprehension, 89.4% for navigation, 87.9% for access to mental health services, and 89.4% for chatbot-related measures.

Compared with previous studies, the main strength of this study lies in integration. Prior works cited in the study address web systems, self-assessment, or chatbot functions in separate or partially connected contexts, whereas this study combines self-assessment, educational content, chatbot-based initial interaction, patient data storage, and consultation scheduling in one clinic-oriented system. This integration is valuable because mental health services often require continuity between early complaint intake, structured screening, data storage, and follow-up scheduling.

The study also offers practical benefits for the clinic. The implemented website can improve flexibility of access because users do not need to rely solely on on-site services for initial screening or complaint submission. For administrators, the centralized system can simplify data monitoring, support scheduling processes, and make service records more organized. The article management feature also extends the system beyond service intake toward educational support.

Limitations and Future Work

The study implies several limitations that should be acknowledged. First, some technical details required for strict journal reproducibility are not fully visible in the extracted text, such as the full NLP method specification and complete evaluation metrics for white-box testing. Second, the available questionnaire results mainly capture user perceptions of usability and usefulness, while broader clinical effectiveness outcomes are not clearly reported. Third, the current chatbot appears to operate within limited response scenarios, which means its conversational coverage and adaptability may still require improvement.

Future work can focus on expanding chatbot response capabilities, improving the precision and transparency of NLP processing, and strengthening mobile access and broader system integration. Additional evaluation may also include more detailed performance metrics, longitudinal usage analysis, and clinical service outcomes. If the system is to be generalized beyond the case-study clinic, future studies should test the platform in multiple service settings and compare operational impacts across institutions.

Conclusion

This study implemented a mental health service website that integrates self-assessment, an NLP-based chatbot, educational content, consultation scheduling, and centralized database management for a mental health clinic. The implementation was designed to address practical service problems identified in the case study, including limited flexibility in early screening, delays in service access, fragmented patient-related records, and the absence of an integrated digital mechanism for receiving complaints and managing follow-up services. Through the developed website, users can register, conduct mental health screening, obtain result summaries, submit additional notes, interact with an AI chatbot, access educational articles, and book counseling sessions through a web-based environment. On the administrative side, the system enables management of users, schedules, bookings, articles, assessment results, and chat logs within one platform. Based on the study, this integrated design improves the structure of service delivery because self-assessment data, chatbot interaction histories, and profile information are stored in a unified database that supports more systematic patient management. The reported testing results indicate that the implemented features functioned according to expected operations, while user responses documented in the study suggest positive acceptance of the interface, service accessibility, and chatbot support. The study therefore contributes a clinic-oriented digital service model that combines early mental health screening and conversational support with operational data management in one website-based system. In practical terms, the resulting system can support more efficient initial services, better organized data handling, and more coordinated counseling follow-up. At the same time, the study highlights the need for further development in chatbot capability, evaluation depth, and broader implementation scope so that the system can provide richer responses and stronger operational impact in future deployments.

Acknowledgments

The author expresses gratitude to the participating mental health clinic, academic supervisors, and all respondents who supported the completion of this study.

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