MOBILE APPLICATIONS FOR SELF-HANDLE OF PORNOGRAPHY ADDICTION

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Abstract

Content with pornographic nuances in the form of images, sound, and videos is widely circulating on the internet, including on social media. Teenagers have great potential to become addicted to pornographic content given the widespread use of the internet among adolescents. Pornography addiction has the potential to interfere with the physical and mental development of addicts, even a wider impact can lead to criminal cases in society, such as rape. This paper discusses the development of mobile applications that aim to help pornographic content addicts get rid of pornography addiction problems. The applications developed include a system for assessing the level of exposure to pornographic content, handling and self-care of pornographic content, and a system for detecting the user's location in solitude. The rating system was adapted from the Pornography Addiction Screening Tool (PAST). Handling and self-care pornographic content use the psychological approach of Cognitive Behavioral Therapy (CBT) which has been widely researched and used as a method for mental treatment and healing. An assessment system for the level of exposure to pornographic content and self-care is presented in the application by utilizing chatbot to increase the interactive between the user and the application. The research method uses the Design Research Methodology (DRM) while the method in developing mobile applications uses Agile models as an adaptive software development method. This application is not intended to replace the role of psychologists, but as a supporting tool that can help pornography addicts to reduce their addiction level until they recover. Through black box testing, evaluation results from a functional perspective show that this application can be used as expected.

Keywords : Addiction, Mobile-app, Pornography

INTRODUCTION

The term porn is an abbreviation of pornography which is defined as a medium in the form of text, visuals, audio, and audio visual which is deliberately produced amateurly and professionally with the aim of stimulating the sexual desires of its viewers [1-6], forms of pornography generally describe various sexual activities, such as: masturbation, oral sex, anal sex, and the roles between the sexes [7-11].

Pornographic content with its various variants is one of the most searched content on the internet, this can be seen from searches conducted through Google Trends, looking at the pattern of users using the keyword "porn" in the last 5 years shows that a high level of interest from users worldwide [12-17]. Furthermore, according to a report on an adult site in 2019 it reached 2 billion visits, with an average daily visit of 115 million times, the number of visits to the site increased by 24% during the Covid-19 pandemic [18]. Even more worrying, pornographic content can easily be found on social media. Explicitly or implicitly easy to find in the form of images, videos, even user behavior through challenges on social media, such as: Twitter, TikTok, Facebook, and so on [19-27].

The tendency to view pornographic content has the potential to have a negative impact. People who are often exposed to pornographic content, whether intentionally or not, will easily become addicted to pornography [28]. The dangers arising from pornography addiction can make sudden and coercive behavioral impulses tend to lead to elements of sexuality [29]. When this urge cannot be restrained, the impact of pornography addiction can not only affect the perpetrators, but can also have a negative impact on society. Addiction to

pornography is the beginning of deviant sexual behavior, pedophilia, and rape cases [30].

With easy access to pornographic content, children and adolescents are the subject with the greatest potential for harm from pornography, given the high use of mobile phones and the internet among adolescents [31]. So that the opportunities for children and adolescents to become pornography addicts are greater. Several studies have shown us that many children at school age are exposed to pornographic content through various media, including social media, as shown in research by shows worrying findings [19-25,32-33]. This is because at that time human development, both physiologically and biologically, was developing very rapidly [28—30, 40].

Addiction to pornographic content has the opportunity to hinder optimal body development because pornography can weaken brain function [34-35]. As a result, pornography addicts' ability to learn and understand something decreases [36]. Addiction to pornography has the potential to cause shame, feelings of guilt, and feelings of being unable to control oneself, making it difficult to carry out positive activities, triggering depression and anxiety, as well as a tendency not to be attached to the social environment [37-40].

Several attempts have been made to overcome pornography addiction, starting from detecting symptoms of pornography addiction through a series of tests for several weeks [40], then considering the relationship between pornography addiction and depression and anxiety, which are forms of mental disorders, treatment methods and mental healing through therapy can be carried out using the Cognitive [37-40]

Technological interventions are carried out such as limiting user access to pornography through blocking the web and pornographic content [41-42] and strengthened by increasing the accuracy of the model to detect content containing pornography [43-44]. Other efforts are made by increasing awareness of addicts to be able to recover from pornography addiction, such as therapy using Cognitive Behavioral Therapy (CBT) in the MoodGym web application [45] and in the form of a mobile application [46-48]. However, the targets of the two CBT studies did not specifically address pornography addiction but rather mental disorders in general.

Towards pornographic content has the opportunity to inhibit optimal body development because pornography can weaken brain function [34-35]. As a result, pornography addicts' ability to learn and understand something decreases [49]. Addiction to pornography has the potential to cause shame, feelings of guilt, and feelings of being unable to control oneself, making it difficult to carry out positive activities, triggering depression and anxiety, as well as a tendency not to be attached to the social environment [37-40].

From the various efforts and research in dealing with pornography, there is still no evidence of handling efforts that involve the use of technology combined with psychological methods specifically to address the problem of pornography addiction. Providing solutions based on mobile applications because mobile applications provide easy and fast access for users to seek the help and resources they need whenever and wherever they need them. This allows them to better manage their addiction in real time, supported by the fact that smartphone users are growing significantly [31] . In addition, it is known that mobile applications are effective as a therapeutic tool to strengthen mental health [50-51].

This article is a continuation of the work we have done previously [52] with the addition of aspects of self-handling and efforts to limit the perpetrator's environment. So in this article we discuss how we develop a self-detection and handling system in the form of a mobile application. We hope that from this article more and more parties will become aware that pornography is dangerous and help pornography addicts to reduce their addiction level until they are cured.

METHOD

The method used as a research framework was carried out using the Design Research Methodology (DRM) method initiated [53]. The DRM method is a research methodology for systematically developing and validating knowledge in engineering design research. DRM consists of research clarification, descriptive study 1, prescriptive study, and descriptive study 2. The method described in Figure 1 emphasizes a research framework that supports a more accurate approach in the planning carried out.
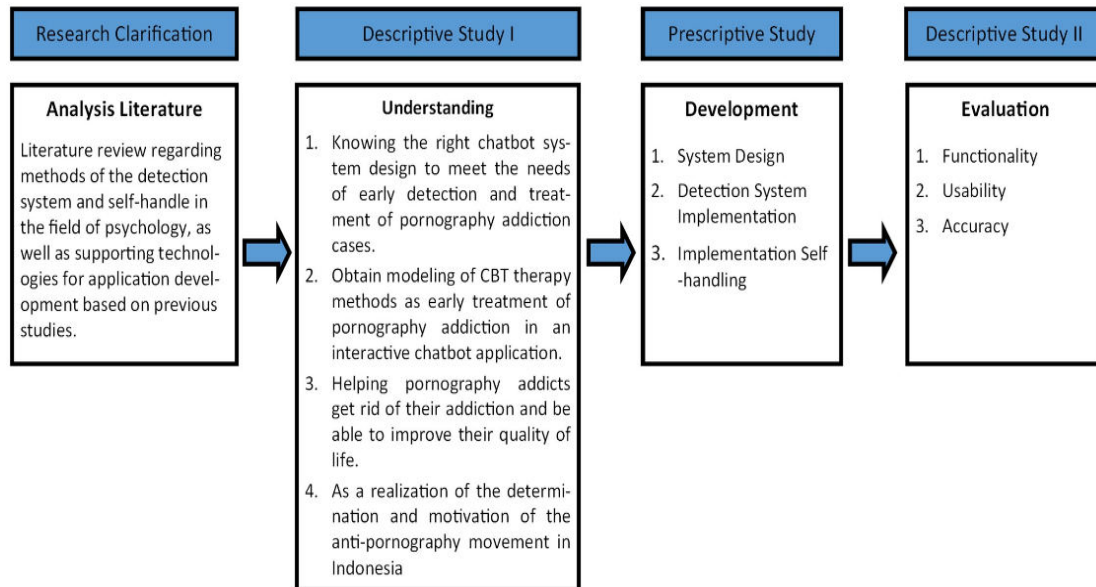
Figure 1. Research Design

In the research clarification stage, the main consideration is how to find the factors that support the success of the research being carried out. In this case, it is important to understand the basic concepts of pornography, its potential dangers, threats from pornography, prevention efforts, technology to support prevention efforts which are carried out through literature studies from various sources. At this stage also determined how the measurement mechanism. We use the Pornography Addiction Screening Tool developed by the Youth Pornography Addiction Center to determine the level of addiction resulting from exposure to pornographic content.

Based on the results of the literature study we found several problems, then the definition of the problem became an output at the Descriptive Study stage 1. The definition of the problem that we identified was: how to model the right chatbot system design to meet the needs of early detection of pornography addiction cases, how to develop a design model for handling early pornography addiction into the system, and how the developed system can help its users know the level of exposure and self-management to get rid of pornography addiction.

In the prescriptive study stage, it is carried out to develop methods that can realize the desired situation. In this case the stages of application development were carried out which included application interface design, implementation of a chatbot-based detection system based on PAST, implementation of self-handling through the development of a mood identification feature based on the feelings module from CBT, and design of a system to prevent users from being isolated in the environment.

The results at the prescriptive study stage need to evaluate the results of its application which is carried out at the descriptive study stage 2. The evaluation stage is the application testing process in the application developer environment to see application performance and error-free before it is used by the user. Evaluation is carried out to measure the functional aspects of the designs that have been previously designed.

To strengthen the implementation of the DRM research method, especially at the prescriptive study stage and descriptive study 2 where the output resulting from this research is a software, we need a framework in software development that has been tested and is adaptive. The software development model that we use in this study is the Agile model as depicted in Figure 2.

The research begins with the planning stage, the process carried out, namely: setting the scope and identifying and analyzing problems of pornography addiction, as well as identifying opportunities and threats in system development. The process of studying literature from journal articles, conferences, and reports from various research institutions is taken as secondary data. Next, an analysis of the required system requirements is carried out from the initial stage to the final stage. Finally, planning a series of activity schedules and a mechanism for monitoring the system work process.
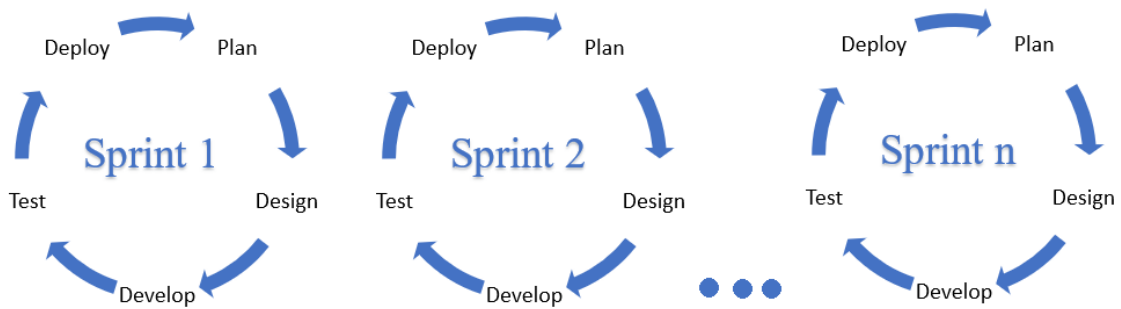
Figure 2. Software Development Method Based on Agile Model

The next stage is Design. Activities carried out are deepening the material as a basis for developing application logic, planning features/tasks in the chatbot application. We then translate the basic logic into flowcharts and use cases. The system design is then described in the form of an application wireframe. Furthermore, the system design validation process is carried out in the application developer environment, before later being tested on psychologists and prospective users. Prospective users are assumed to have characteristics close to the main target of application users. The output of this process is application prototyping.

Furthermore, the Develop stage is the process of implementing the system design into lines of code. At this stage coding the program includes the application interface, database structure, to the authentication mechanism. Database settings, such as: context recognition based on keywords and their responses, then the output of the detection results based on PAST, to record user data for user authentication needs into the system. In this article, the implementation process includes a self-detection and treatment system through recording the user's mood which is the basis for recommendations for diverting desire to open pornographic content.

The test phase is carried out with the aim of validating the accuracy between the design and development stages so that the application is ensured to be free of bugs. In this article, the stages of testing are carried out in the developer's environment for processes in the detection and self-handling system through mood recording. The mechanism for testing the system uses the Black-box testing method to observe the execution of the application when carrying out previously designed functionality.

At the Deploy Stage, the application is implemented to users, at this stage evaluation is still being carried out. The results of this evaluation will become improvements and spark new sprints. The principle at this stage is to develop the application again based on the feedback provided by the user so that the system can continue to run and develop according to its function.

RESULT AND DISCUSSION

The results section describes the results obtained following the DRM research design scheme and Agile Model software development methods. The planning stages have been explained in detail in the Introduction Section and the Methodology Section. The following discussion will focus on the Design Stages, Develop Stages, Test Stages, and Deploy Stages. Detailed explanation of each stage will be explained in the following paragraphs.

System Design

The system built is in the form of a mobile application on the Android platform (minimum version of Android 5.0). There are two main features developed, namely: a pornography addiction detection system built on the measurement technique of the Pornography Addiction Screening Tool (PAST) as well as a self-handling system based on CBT and addict detection in isolated locations. There are two entities involved in this detection system, namely: the user and the application system. The system workflow can be seen in Figure 3.
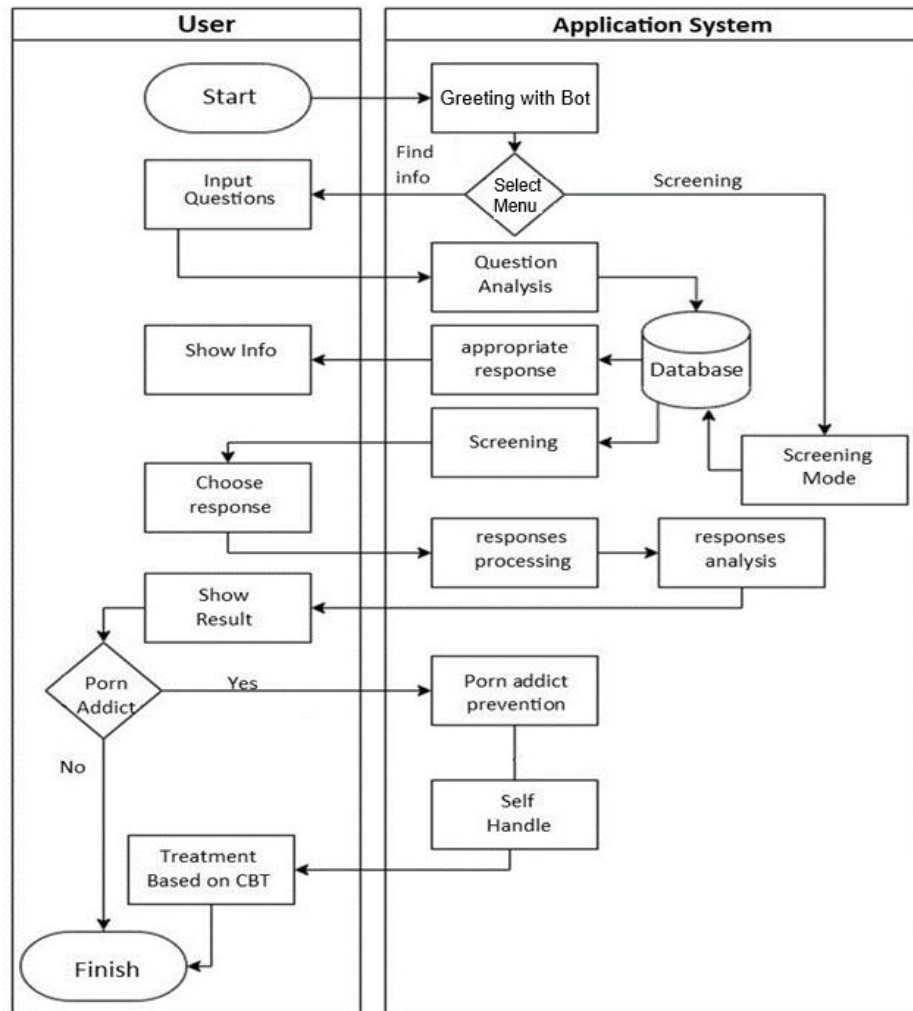
Figure 3. Flow Chart of the Developed System

The system flow depicted in Figure 3 begins with a greeting from the Bot to the user. Users can choose a service to chat with bots to seek information or screening. The screening service is used to determine the user's level of addiction to pornography. The output from this stage is a score based on PAST. Users who are indicated to be addicted based on the screening results are then recommended to undergo treatment through an application based on CBT.

In application systems, databases are a crucial component to develop. In Figure 3 it can be seen that the database supports various activities. The database used in the application uses two mechanisms, namely: a cloud-based database and a database built locally on the user's device.

The recommendations that come out of this application do not necessarily become the main reference for treatment, the recommendations of psychologists are still prioritized.

Furthermore, the interaction between the user and the application is represented using a use case diagram. Actors are entities that receive or provide information from a system. Actors in the built system are target users, namely pornography addicts aged 12-30 years and chatbot applications. The language used in the system is Indonesian, chatbot technology is developed by taking into account context and responses with a language style adapted to the target user. The developed system consists of 5 events in the two actors shown in Figure 4.
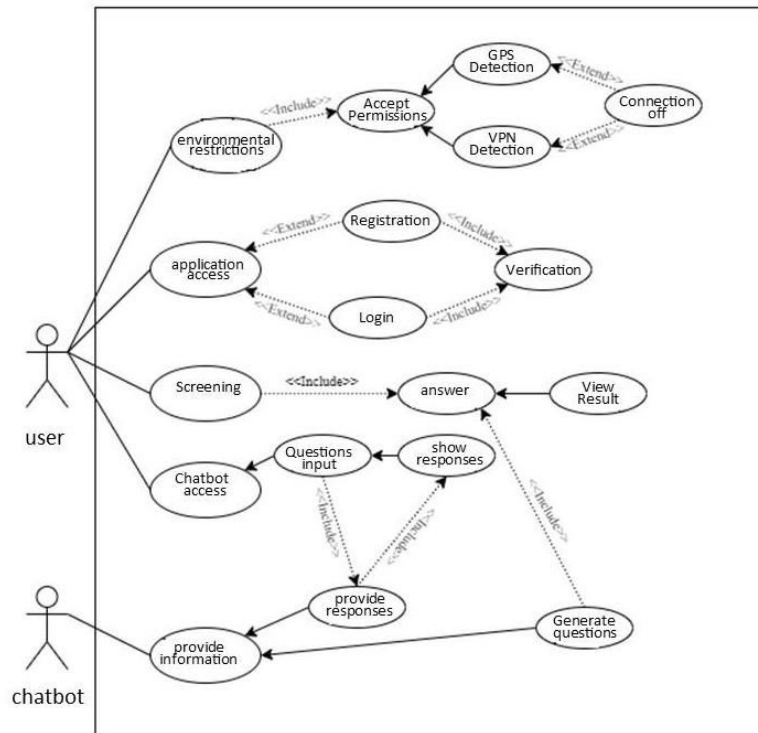
Figure 4. Use Case Diagram of the System Developed

Application

Implementation is carried out based on the results and evaluation of the system design. Evaluation at the design stage is carried out to increase user convenience. One of them is evaluating the implementation of chatbots, the system will identify keywords from messages entered by users. However, based on the results of user experience analysis, the number of questions during the screening process for pornography addiction has the potential to cause users to get tired of answering questionnaire questions, so a button feature was created to help users choose answer options.

A login mechanism is made to check the user's progress, if the user is a new user then he will be directed to take part in a screening to assess the level of exposure to pornography he has experienced, whereas if the user is an old user then the application will display the progress that the user has achieved. In addition, after login the application detects the username and it will be used as greeting and greeting in the message displayed in the chatbot.

Next, the user will be directed to answer several questions that are used as a test instrument for detecting pornography exposure levels. To make it easier for users,

Development

an answer button feature is provided so that users don't have to be tired of typing answers to questions. There are 25 questions asked and there are five answer choices for users to choose from which best describe their condition. Each answer choice has a weight that will be calculated by the system so that it can decide the user's level of exposure to pornography. The application also provides a progress bar, so users can measure the number of questions answered.

As an AI language model, the chatbot works based on a pattern matching process to classify text and generate appropriate responses for the user. This technique adjusts answers based on received wording of incoming questions, matches user input to predefined patterns or rules, determines the user's intent or goal based on the input received, and then after determining user intent, the chatbot uses pattern matching to determine the appropriate response. Matching patterns can use previously learned data to improve their ability to understand and respond to user input. This could be a database of keywords, grammatical rules, or even dialogue patterns that have been learned from previous conversations.
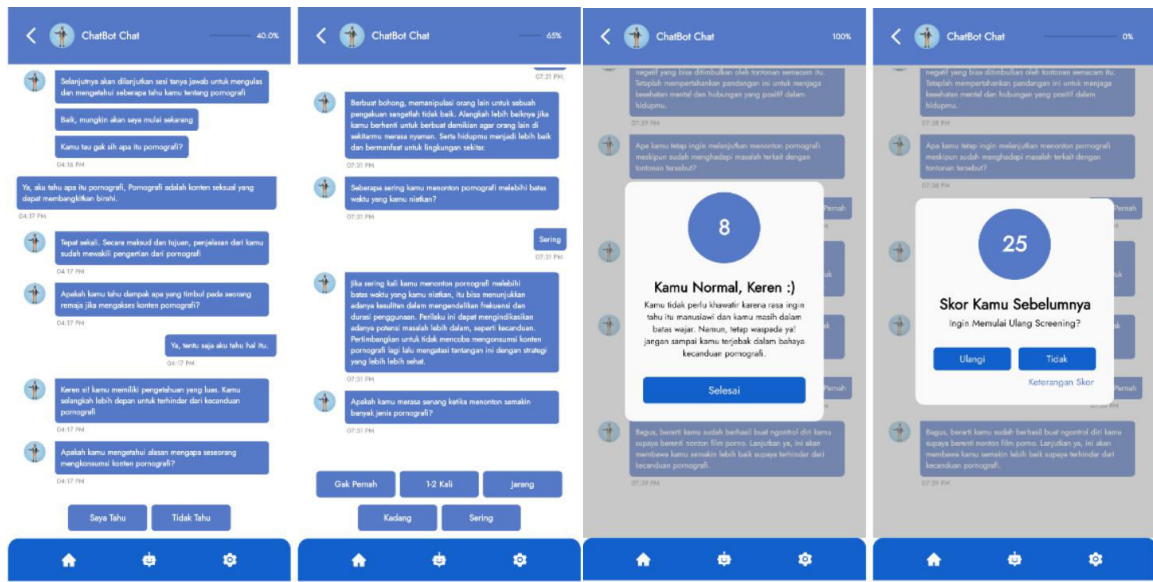
Figure 5. Display of Detection System in Chatbot

The Pornography Addiction Screening Tool (PAST) can be used as an early stage assessment tool by individuals who have a perception of experiencing pornography addiction in themselves. PAST is an assessment rubric consisting of 25 questions and there are five possible answer choices from 0 (never) to 4 (often) and then the user chooses the one that best describes their condition.

Each answer has a weight and will be calculated based on the following formula:

$$Total\ Score = \sum_{i=1}^{25} a_i \qquad (1)$$

where, a_i is the score obtained is based on the answer determined by the user for each question. This formula is calculated by the system so that it can decide the user's level of exposure to pornography [54-55]. Based on PAST, a person's exposure level related to pornographic content is explained in the following table.

Table 1. PAST-Based Pornography Exposure Rating System

Total Score	Addiction Level	Description
0 – 25	Normal	Normal sexual curiosity
26 – 49	Involvement with pornography	Vulnerable to the possibility of addiction
50 – 69	Pornography addiction emerges	Hypersexual behavior is visible
70 – 100	Porn addiction	Can't get away from pornography

Table 1 forms the basis for the early-stage assessment mechanism for pornography addicts. This assessment is carried out interactively to provoke the motivation of individuals who have perceptions of pornography addiction, but with the consideration of maintaining the privacy of its users. On this basis, the chatbot system was chosen because it is able to accommodate these problems.

In developing the application at the treatment stage, we refer to 'moodgym' which is a research product in the form of a web-based application developed by the Australian National University as an independent therapy application that can help prevent and manage symptoms of depression and anxiety from its users (Moodgym CBT Training Program). The steps we take from the therapy stage are to record and respond to the mood/mood of users who are detected as addicted to pornography. There are several mood conditions that we record, ranging from: happy, sad, angry, bored, scared, and so on [56-57].
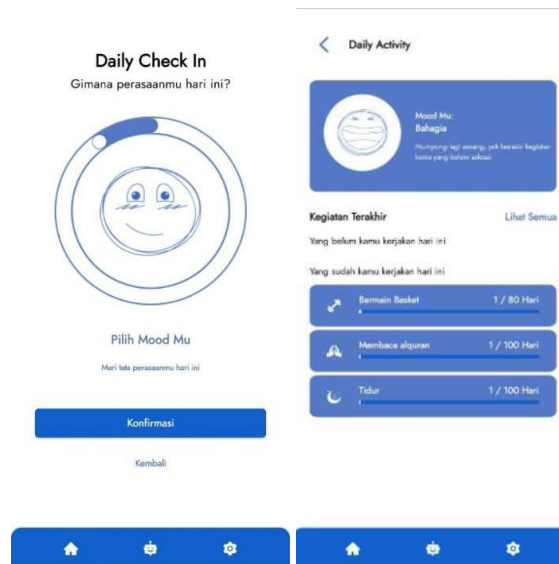
Figure 6. Handling Based on User's Mood

From the mood conveyed by the user, the application will save then calculate and provide recommendations for what activities the user needs to do as a distraction to open pornographic content.

designed functionality and overall the application's core features such as features for detecting and handling users who have received pornography addiction detection status.

Test Scenarios

All applications are developed in their entirety through an application testing process in the application developer environment to see application performance and are free from errors before being used by users. Testing is carried out using the blackbox testing method. The test scenario carried out is to observe the application execution when carrying out the

Result Test

Black box testing is testing in terms of functional specifications without testing the design and program code to find out whether the functions, input and output of the software comply with the required specifications [58]. Table 2 is the test results that have been carried out done by the developer.

Table 2. Result of blackbox test

Test Scenarios	Test Cases	Expected Results	Actual Results
Register	Register via a valid email account	Can register via a valid account.	According to the scenario, successfully registered via a valid account from Gmail.
	Registration using invalid email	Cannot register via an invalid email account	According to the scenario, you cannot register and a notification appears
	Register using your registered email	Cannot register via an already registered email account	According to the scenario, you cannot register and a notification appears
Sign-In	Sign-in with a valid email account and password	You can sign in and enter the introduction menu	According to the scenario, successfully sign-in and enter the introduction menu
	Sign-in with an invalid email account and password	Unable to sign-in, user re-enters account	According to the scenario, unable to log in, the user re-enters the account.
Interaction Features	Question interaction answer with bots	Bots can carry out question and answer interactions with users.	According to the scenario, Bots can carry out question and answer interactions with

			users.
Screening detection addicted pornography	Screening through 25 questions with 5 answer options, 4. Screening results	For every question answered, the chatbot provides a different response for each option. Appear notification in the form of value screening and level his addiction	According to the scenario, for each question answered, the chatbot provides a different response for each option. According to the scenario that appears notification in the form of value screening and level his addiction
Daily check in	Choose your daily mood.	The mood feature has been successfully set and the mood data is saved in the application.	According to the scenario, the mood feature is successfully set and the mood data is saved in the application.
Dashboards daily activity	View status and register daily activities user.	Through the dashboard menu, users can see their daily activities.	According to the scenario, through the dashboard menu users can see their daily activities.
Scheduling	Add activities in the scheduling menu Add activities that Collide with a schedule other activities	Activities can be added and viewed in the scheduling menu. Activities cannot be added and a notification appears that there are activities at that time	According to the scenario, activities succeed added and seen in the scheduler menu. According to the scenario, activities cannot be added and a notification appears that there are activities at that time.
Activity Scheduling with (Artificial Intelligence) features.	Activities are analyzed and categorized by AI	Activities are possible categorized as by AI	According to the scenario, activities Activities are possible categorized as by AI.
Chatbots with AI (Artificial Intelligence) feattures.	Ask something or vent on chatbots	Chatbots always provide feedback based AI.	According to the scenario, Chatbots always provide feedback based AI.
Change theme	Set to dark or light theme	The application theme can be changed to dark or light theme	According to the scenario, the application theme can be changed to dark or light theme.
Edit profile	Edit Profile data	Profile data can be edited.	According to the scenario, the profile data can be edited.

The table above explains the application testing process through the features that run when the application is used. From the tests that have been carried out, the results obtained are that all features can work according to the expected results.

CONCLUSION

The development of chatbot-based mobile applications as a system for detecting and treating pornography addiction is a solution to difficulties in detecting and treating victims of pornography addiction. This application is interactive but still makes users feel comfortable because their privacy is guaranteed. The application has been functionally tested to be able to detect levels of exposure to pornography and record mood conditions and then direct users to divert their desire to open pornographic content to other, more positive activities. This application is not intended to replace the role of psychologists, but as a supporting tool that can help pornography addicts to reduce their addiction level until they recover.

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