# Mobile Application Design for Online Physiotherapy Services

Nizirwan Anwar[1(✉)], Jerry Maratis[1], Dewanto Rosian Adhy[2], Rudi Hermawan[2], and Muhammad Abdullah Hadi[1]

[1] Esa Unggul University, Jakarta 11510, Indonesia
nizirwan.anwar@esaunggul.ac.id
[2] YBS Internasional High School, Tasikmalaya 46122, Indonesia

**Abstract.** Type disease and disorder health the more many and varied. Dynamics Public as well as technology and change method life influence condition health society. Appearance The covid pandemic is also one development of disease and health. Need anticipation to condition that. Consider the need to lower disease risk and raise society's health standards Anticipation can be on the side engagement or preventive but also on the side management or management treatment. Physiotherapy as one form of treatment uses methods, training, and equipment specifically for patients could restore, maintain and improve ability his physique. Activity this could be used for treatment or preventive to disease certain. Pandemic time has pushed human activity and minimized contact. Condition this need anticipated for activity treatment physiotherapist. Using technology could answer needs that. A study built a system consultation physiotherapists and information related to health physique with the use of technology information. The technology used is to build a mobile application. Development results already tested try and survey gives results satisfaction user.

**Keywords:** Physiotherapy · Mobile Apps · Online Services

## 1 Introduction

Covid 19 pandemic that has arrived in the world has given many changes in society. The fast and easy viruses spread make change life in society. One of them is appearance protocol health. Part of protocol health is to minimize physical contact.

In various scopes, professions occur change. Work from home appears, study at home or online learning, online shopping needs. Almost all activity is directed to going online or minimalizing stare face. Condition This is also experienced in the field of health. Popping draft consultation health, the treatment process that uses technology information. Especially level risk transmission among health high enough.

System service online health like Hallodoc, Konsuldok, and others the more developed because they can give solution consultation treatment without stare face. Then appear, much research and development in consulting and service health-based mobile applications.


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A number of example of mobile application in service health is for handling healthy babies [1]. Handling pregnant mothers starts with consulate nutrition and service development content [2, 3]. The other apps are for handling tuberculosis patients [4, 5]. Other diseases that have been developed by the mobile app are stroke, diabetes, and others [6, 7].

For treatment that requires many meetings, mobile applications will be very helpful; one treatment like that is physiotherapy. Treatment using _ method practice physique will help if there is an app that accommodates information related to pattern practice physiotherapy and also online consultation with a physiotherapist.

Based on the background of the problem above, the writer formulates the problem as follows:

1. How to make an app mobile for service physiotherapists.
2. How can these tools provide convenience? For physiotherapists and patients in to do the treatment.
3. How can the tool be a system that facilitates the treatment process of physiotherapists in the era of the pandemic?

The purpose of research in writing a thesis is as follows:

1. Utilize technology information as one treatment process solution.
2. Share knowledge and experience about research in the field of physiotherapy with the utilization of technology moment.

Meanwhile, the research objectives in writing the thesis are as follows:

1. Designing and making an app _ mobile for service physiotherapists.
2. Designing and making an android-based app that can provide convenience for physiotherapists and patients in to do the treatment.
3. Make a system that facilitates the treatment process of physiotherapists in the era of the pandemic.

The results of the research that are expected by the author are to provide the following benefits:

1. Provide convenience for patients or the public in carrying out the treatment process physiotherapy.
2. Hone knowledge about technology information and physiotherapy.
3. Help development knowledge and technology as well as add outlook knowledge for study next.

## 2 Methodology

Physiotherapy is one method of treatment in patients who have complaints or indications sick. A physiotherapy is a form of treatment with training and equipment specifically for patients that could restore, maintain and improve ability his physique. Physiotherapy focuses on function, movement, and use potency child optimally and use an approach physique to promote, maintain and restore well-being physically, psychologically, and socially in all environment patient, including at home, school, recreation, and the environment Public[8, 9]. Physiotherapy use one of them is for recovery. The process is done routine and repetitive, so that need relatively long and continuous time. Physiotherapy has already been conducted for the treatment of chest disease [10]. Other research is on the treatment of Cerebral Palsy [8].

### 2.1 MobileApps

Development of technology and change dynamics Apps-based public push appearance technology. The technology employs high-speed and high-capacity Internet development as well as appearance applications operating on smartphones. Utilize the numerous MobileApps currently established in the health industry. Among the new applications that have evolved in the community are Hallodoc, Konsuldoc, and several others. Other emerging research not yet available to the public, including: the application contains information and consultation about the disease tuberculosis [4]. Other apps are for helping TB patients do treatment routine and term long related with obedience in consumption medicine [5]. Many other apps have been developed for handling mother pregnancy and growing baby. The other disease is the treatment of diabetes and stroke [6, 7, 11].

### 2.2 Method Study

To develop device software in a shorter amount of time, developers frequently employ prototyping. Prototyping is the rapid construction of a test model, or prototype, using a novel way of work that is performed in an interactive, iterative process. As a tool for development, prototyping expedites and simplifies the design and development process, particularly for projects where it is difficult to define the development model of a product or software that demands more rapid development.

Prototyping can be utilized for both large and small applications. Typically, for large system applications, the traditional approach to system development is still used, but a portion of the system additionally employs a prototype. The user requires a prototype of a business application to be rapidly produced using various application development devices soft. This system prototype was then continuously tested and refined until it was accepted by the customer.

Prototyping is an iterative process, including a series of interactive sessions. For instance, we can create, test, and enhance prototypes for report management, screen data entry, and output display. The O'Brien model prototyping procedure [12] can be described as follows:

- Investigation
  Work performed to determine their business requirements and evaluate the suitability of a number of potential information system options.
- Analysis
  Analyze the many components of the medium system, including the hardware, software, network, and human resources. The analysis system must identify system requirements. Among other things:

  (1) The system demanded (input)
  (2) The output achieved (output)
  (3) Operations carried out (process)
  (4) Data sources administered
  (5) Control (control)

- Design
  The design of the system determines how the system will accomplish its objectives. System design is comprised of design activities that generate functional requirements. System design can be considered as the design of interfaces, data, and processes with the objective of providing product and interface method requirements that meet user, structure, and product interface methods. Database and processing and controls.

  Distribute software The prototype is regularly tested, implemented, evaluated, and modified until user acceptance is achieved. The purpose of system testing is to identify system problems and improve the system. This phase is essential for ensuring the system is error-free.
- Maintenance
  Care or maintenance of software on a periodic basis after the system has been adopted, including repair or modification of the system to improve its performance.

## 3 Result and Discussion

### 3.1 PIECES Analysis

The following are the outcomes of the PIECES analysis of the operating system:

- System Efficiency Evaluation
  Table 1 shows the results of an examination of the performance of the offline system's operation at the present time.
- Information Analysis
  The results of the information-related PIECES analysis are shown in Table 2. a good information system, it will generate helpful patient information, one of which is boosting the amount and quality of physiotherapist services.
- Economic Analysis
  Enhancement to the economic influence to manage expenses and upgrade benefits, which will be observed from the currently operating system instant onwards. To develop patient recording, the current data management system is insufficiently cost-effective. The analysis results are presented in Table 3.

**Table 1.** Results of Performance Analysis

| 6+2Parameter | Analysis results |
|---|---|
| Throughput | The presentation of data requires a considerable amount of time because it must be presented to the physiotherapist immediately. |
| + + Respond Time | Due to the necessity for monitoring and data collecting, the period required to display information is rather lengthy. |

**Table 2.** Results of Information Analysis

| Parameter | Analysis results |
|---|---|
| Accurate | There are still errors in the presentation of information because data entry is still performed manually. |
| Relevant | Due to a lack of pertinent information, it is vital to establish a system that can deliver precise information when it is required. |
| Exactly on time | The length of time it takes to learn about a patient's progress results in decisions that are not based on accurate information. |

**Table 3.** Results of Economic Analysis

| Parameter | Analysis results |
|---|---|
| Cost | It costs a lot for book supplies, stationery, and filing cabinets. Because the recording is done in books and stored in filing cabinets. |

**Table 4.** Results of Control Analysis

| Parameter | Analysis results |
|---|---|
| System Control | Lack of control in every recording of development data patients so that the information obtained is less accurate. |

- Control Analysis
  In order to improve the performance of a system, control must be present. The outcomes of the conducted analysis are presented in Table 4.
- Efficiency Analysis
  Related Research Indicated in Table 5 are the efficiency-related outcomes.
- The categories of the Service Analysis
  Enhancement service are diverse. The selected project is an improvement of deep service efficiency and production data management convenience, given in the form of information. Analysis results associated with service poured into Table 6.

**Table 5.** Results of Efficiency Analysis

| Parameter | Analysis results |
|---|---|
| Source of capital | When an error happens, the materials utilized to record production data, such as books, paper, and pens, are sometimes excessive. |
| Energy Source | The recording of activities is performed by an employee or the patient himself. Therefore the time required to collect data is relatively lengthy. |

**Table 6.** Service Analysis Results

| Parameter | Analysis results |
|---|---|
| Service Process | The current system has not made it simpler for patients to obtain correct information on the status of health services in the clinic, so hindering the process of patient care. |

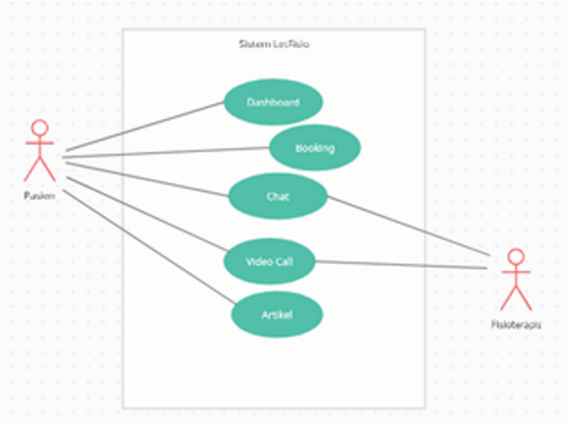


**Fig. 1.** Use Case Diagram System on Android Application

### 3.2 Design Diagram UML

See Figs. 1, 2, 3, 4 and 5.

### 3.3 PIECES Ana

Implementation entails putting the created design into action. At this stage, the system that will be developed is being implemented. Configuration of the system This is separated into 4 sections: system implementation in the physiotherapist application, system implementation in the patient application, system implementation on the database server, and system implementation on the server (Figs. 6, 7 and 8).

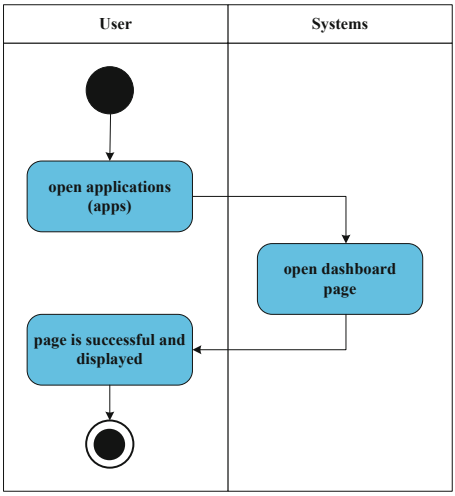


**Fig. 2.** Activity Diagram Login Application

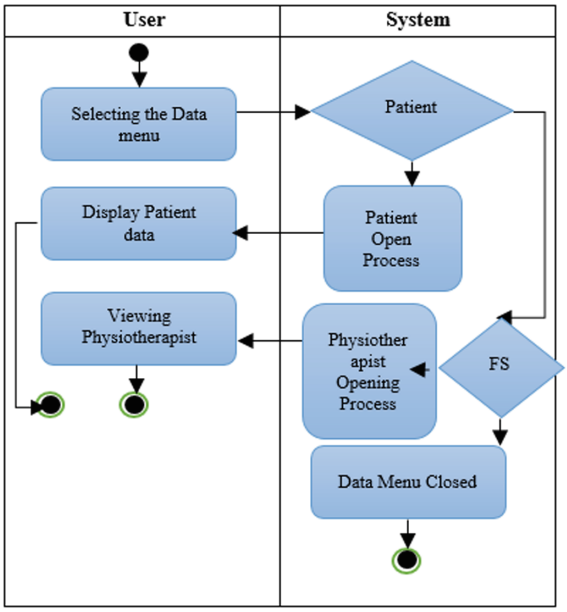


**Fig. 3.** Activity Diagram Open Android Application

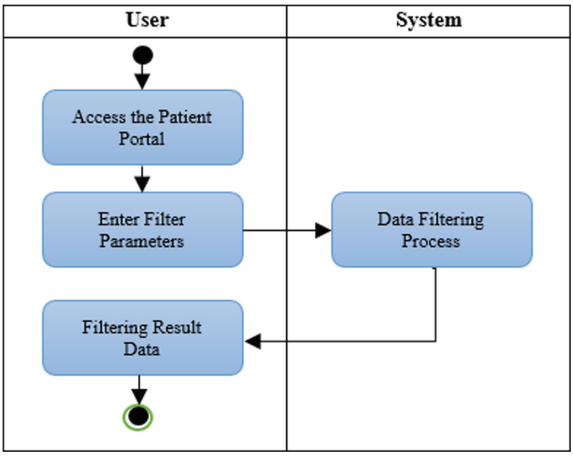


**Fig. 4.** Activity Diagram for Filtering Patient Data

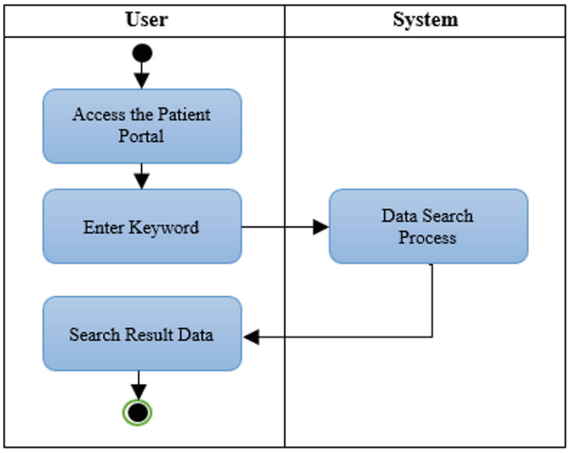


**Fig. 5.** Activity Diagram for Searching Patient Data

### 3.4 Design Diagram UML

At this step, the testing of the system is described in detail with the purpose of determining system performance, flaws, and potential mistakes that may arise during system operation. In testing system on the android application, the author conducted a test run on a Samsung Android handset running Android operating system version 4.3.

System testing is conducted using the black box testing method, in which only the functionality of the system's functions is examined, regardless of the code's underlying operations. The following results were obtained based on the outcomes of the conducted trials (Tables 7, 8 and 9).

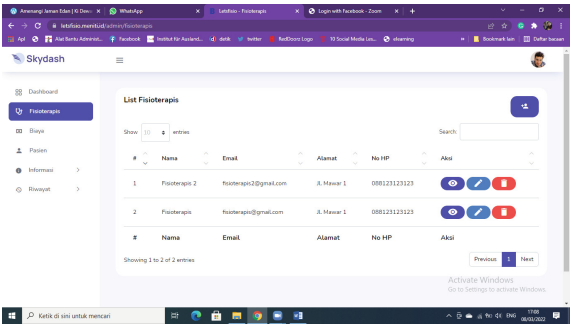


**Fig. 6.** Interface CRUD Physiotherapist Admin Page

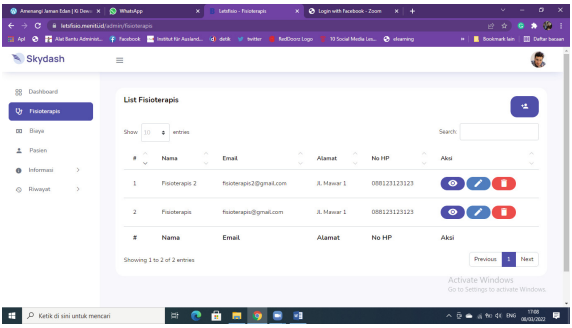


**Fig. 7.** Article CRUD Admin Page Interface

### 3.5 Discussion of System Test Results

Based on implementation and testing, the LetFiso application is functioning as expected, including

1. System Administrator in form Page operating well with data management.
2. Communication of data between Android and the server is feasible.
3. Developed
4. Android applications are capable of providing online consulting services.

## 4 Conclusion

### 4.1 Discussion of System Test Results

System analysis, design, and testing conclusion With the Let's Physio application for Service Physiotherapists, the author might draw the following conclusions:

1. System let's physiology consultation could apply for physiotherapy service consultation and treatment. Patients who have a physiotherapist.
2. The technology supports consultation through chat, audio, and video calls.

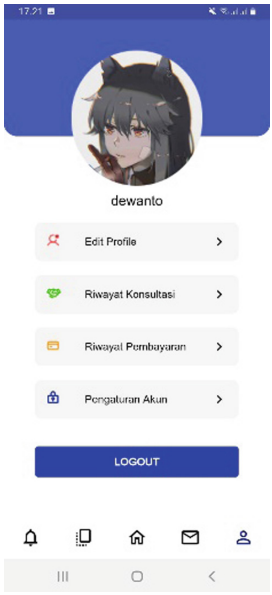


**Fig. 8.** Application Interface Physiotherapist

**Table 7.** Black Box Testing page admin system

| No. | Testing Scenario | Test Case | Expected results | Expected results |
|---|---|---|---|---|
| 1 | When Login System | Enter user data correctly | Login to dashboard | Valid |
| 2 | When Login System | Incorrect user data input | Failed to Login Dashboard | Valid |
| 3 | CRUD form Physiotherapist | Input/ Edit/ Delete physiotherapist data | Data changed according to the selected process | Valid |
| 4 | Article from CRUD | Input/ Edit/ Delete article data | Data changed according to the selected process | Valid |
| 5 | CRUD Transaction form | Input/ Edit/ Delete Transaction data | Data changed according to the selected process | Valid |

3. Monitoring system application utilizing third-party service activation and paid audio and video calling services.
4. Applications utilizing a third-party facility for payment service consulting.
5. The application contains physiotherapy-related facility science content in text and video formats.

**Table 8.** Black Box Testing sending data from Mobile Application to Database Server

| No. | Testing Scenario | Test Case | Expected results | Expected results |
|---|---|---|---|---|
| 1 | New User Sign In | Data Input | Add new user data | Valid |
| 2 | User Sign Up | Data Input | Add visit data | Valid |
| 3 | The moment there is a user connection | User Login | Add login user data | Valid |
| 4 | When there is a connection physiotherapist | Physiotherapist Login | Add physiotherapist data enter | Valid |

**Table 9.** Black Box Testing Android Application

| No. | Testing Scenario | Test Case | Expected results | Expected results |
|---|---|---|---|---|
| 1 | Opening the App | Open the Let's Physio App | Dashboard page displayed | Valid |
| 2 | Opening Profile Data | Profile Data Menu | User Profile Data page is displayed | Valid |
| 3 | Article Data | Article Data Menu | An article Data page is displayed | Valid |
| 4 | Physiotherapist Data | Physiotherapist Data Menu | Physiotherapist Data page displayed | Valid |
| 5 | Open Schedule Info | Schedule Info Menu | Schedule Info page displayed | Valid |
| 6 | Open Video Gallery | Video Gallery Menu | Gallery page Video shown | Valid |
| 7 | Physiotherapist Data Filtering | Physiotherapist Data Filter | Show Data physiotherapist according to the date parameters entered | Valid |
| 8 | Schedule Data Filtering | Schedule Data Filter | Schedule Data according to the input date parameter | Valid |
| 9 | Booking Data Filtering | Booking Data Filter | Displaying Booking Data according to parameters | Valid |

(*continued*)

**Table 9.** (*continued*)

| No. | Testing Scenario | Test Case | Expected results | Expected results |
|---|---|---|---|---|
| 10 | Filtering Consultation Status Info | Consultation Status Info Filter | Displays Consultation Status Info according to the parameters entered | Valid |
| 11 | Physiotherapist Data | Physiotherapist Data | Physiotherapist Data according to the keywords entered | Valid |
| 12 | Schedule Data | Schedule Data | Schedule Data according to the keywords entered | Valid |
| 13 | Chat Features | Open Chat | Display the Chat Page and start a chat with a physiotherapist | Valid |
| 14 | Payment Features | Open Transaction | Displaying Transaction Page | Valid |
| 15 | Video Call Features | Open Video Call | Showing the video call page | Valid |
| 16 | Audio Call Features | Open Audio Call | Displaying the Audio call page | Valid |

6. There are applications available for facility summaries for knowing condition financing.

### 4.2 Suggestion

Several ideas for additional improvement might be made based on the presented conclusions, including the following:

1. Adding payment methods is common as new payment gateways emerge.
2. Development of existing systems through the establishment of connections or links with popular video calling applications.
3. Authentication of users has been added to enhance system security.
4. The system has been updated to look nicer when accessible over the web.
5. Added an automatic notice feature when data on the database server is modified.

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