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Home Care Service Application for Patients

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ABSTRACT

IT development has entered into all aspects. One of them is in the health sector. The current problem is that people do not dare to go to hospitals, health centers, or clinics for fear of contracting Covid, especially for children and the elderly. This is the main reason for providing care to patients that can be done at home. Based on this, it is necessary to apply home care services to provide services to patients at home. This service needs to be socialized to the community, employees and teams must be equipped with home care knowledge so that they can provide good services. This research is a type of qualitative descriptive research with a holistic approach. The method used in developing the application is Agile Method, with primary and secondary data support. The focus of development is patient management so that patients can easily access applications without administration malfunction. The results of this study are web-based applications with a testing process using the Whitebox and Blackbox methods with a feasibility value of 82.5% (Good category).

Keywords: *Online Service, Patient Medical Care, Home Care Application.*

1. INTRODUCTION

The development of Information Technology makes it easier to order services via online system. Various systems were developed to facilitate services such as transportation, food, services, products, and health. It is very important to facilitate the development of such online applications, especially for home care. Home care has long been known and it became indispensable now, especially during a pandemic. This service includes several services for toddlers, children, adults, and more elderly patients as well [1]. Suitable for children who are afraid of hospital or health center, patients who need treatment after undergoing hospitalization, blood pressure checks, diabetes checks, blood sugar checks, post-operative care, burn care, diabetes wounds, and post-stroke. This service is now widely applied to clinics, hospitals, or health centers to serve patients. However, the access used so far is still based on the home care form and not an electronic system. Health today is very important because it is a basic human need, just like eating. According to Maslow's theory, it is explained that basic human needs involve the fulfilment of physical needs. One way to improve and maintain family health is home care[2].

Based on the reality, the home care application system is much needed by the community because the intensive care process must continue at home because it cannot be done in hospitals or clinics during the pandemic [3][4]. This is also very helpful for the government in improving services to the community because Indonesia has vast territory, so not all people can enjoy services such as clinics and hospitals. This application development continues to be carried out by improving the services needed by users to provide easy access to use this application. Home health services are carried out to provide health services to families, so based on this it always prioritizes the patient satisfaction through the provision of quality health services without violating ethics and professional service quality standards. Services must also be carried out by a professional team who have competence in home care [5][6] and patients receiving care also provide an assessment of the services provided by the home care team. Communication occurs between service recipients and service providers. The purpose of this service is to maximize the level of independence and minimize complications resulting from illness as well as to fulfil the basic needs of patients and families.

Based on research conducted with a sample of 76 people, the results of the study concluded that reliability, assurance, direct evidence, empathy and responsiveness in home care services at the Puskesmas are related to the patient's family [2]. Home care services also open job opportunities for health graduates such as nurses, midwives, doctors to further sharpen their experience when dealing with patients. During the pandemic, it is impossible for patients who need light treatment to come to the hospital because they have the potential to contract the disease. Meanwhile, patients suffering from infectious diseases such as Pulmonary Tuberculosis and congenital diseases (not Covid 19) are also risky to go to the hospital because of their age, distance, and other factors that make it impossible for them to get treatment at hospitals, clinics, and Puskesmas [7]. Home care services are important to provide education and family support to manage and improve the quality of life of TB patients by building self-reliance and empowering families support. Often families whose have parents need treatment cannot take their parents to the medical center choose the home care for treatment. The work of homecare nurses has been affected by several changes, including an aging population, decentralization of health care, a crisis of nurse recruitment and scarcity of public resources [8].

This research took a holistic approach. First, it combined, psychosocial emotional and cultural elements to unify common current understanding in a more cohesive framework. Second, tensions that hinder communication and collaboration between stakeholders had to be resolved. Third, information and communication technologies were rapidly becoming synonymous with home care, and offer solutions to facilitate future care delivery, collaboration, and professional home care training [9].

Based on the above explanation, it is necessary to develop a home care application, which provides easy access for the user and to patient data management so that the effectiveness of the system increase and further promote the willingness of the patient to use the system. It in turn provides input to the system as evaluation material for the team in improving service and performance. The system developed is web-based, to facilitate access for users to access the system from anywhere through devices connected to the internet. The system development method is the Agile Method mainly based on input from application users. The product of system development is a home care service application that can be accessed through the https://kiandrahomecare.id/ domain. However, some technical improvements are being made to the system and fixing bugs that occur in the development of prototypes that have been designed and implemented.

2. METHOD

2.1. Research Design

The place of research and data retrieval was Kertha Usada General Hospital, a private hospital located in Singaraja. This activity aimed at obtaining initial information as material for the development of a web-based home care service application. However, at the hospital, the home care process is still manual, with the patient filling out a form to get this service. The next step is to find data. The process to obtain data was carried out by several methods such as: observation, interviews and literature review. All the activities took 6 months long, from April to October.

Data is something that has no meaning for the recipient and still requires processing. Data can be in the form of a situation, images, sounds, letters, numbers, mathematics, language or other symbols that we can use as material to see the environment, objects, events or concepts. Data can be divided into 2 types, namely, primary data and secondary data.

Primary data is the main data or basic data used in research, obtained directly from the original source (not through intermediary media). Primary data can be in the form of a subject's opinion, individually or in groups, the results of observations of an object, event or activity and test results. The primary data used this research was in the form of a home care form and procedures carried out in this study.

Secondary data is complementary data that can be obtained without the need to go through the original source but through the intermediary sources, third source and so on. Secondary data can be obtained through the media or indirectly in the form of books, notes, existing evidence, or archives that are published or unpublished.

Related research, such as that carried out [10] namely the use of Geographic Information Systems (GIS) for home care service applications. Home care is a continuous and comprehensive health service provided to individuals and families at home with the aim of improving, maintaining or restoring health or maximizing the degree of independence and minimizing the consequences of disease. The home care service information system was created using GIS as a mapping tool. The home care application helps patients in ordering treatment programs and assists nurses in finding the location of patients using GIS features and helps admins in organizing the process of completing care. The use of home care technology has many benefits for various parties, including patients and health workers. The aspect of convenience and increasing area coverage and reducing costs are

advantages that can be seen directly, patients could locate the current position of the nurses and managing home care programs. The cost of home care is higher than the common health service However, based on research [11] patients consider the cost of home care is reasonable so that patients can afford it. The ability of the patient to pay the cost of home care is an opportunity for the developer of this application.

There is other related research that is also used as secondary data, namely research [12] in a journal entitled "home care", home health care / home care is a form of nursing service, including community nursing care carried out at home. It is an application of various kinds of nursing science that studies humans as individuals, families, groups and communities. Home care is a home visit carried out by nurses. It is carried out to help individuals, families and communities to achieve independence in solving the problems they face. Home visits are tailored to the needs of the client. Home care begins with the phase of pre- initiation, initiation, implementation, termination and home visits. The types of services provided include nursing services (diagnosing and treating human responses to potential and actual health problems in meeting the needs of the client basic needs) and public health services (primary, secondary and tertiary prevention). The benefits of home care for clients and families help reduce hospitalization costs, strengthen family ties, feel more comfortable.

The observation method is a method of collecting data by observing directly in the field. Observing is not only seeing, but also recording, calculating, measuring and recording existing events, after which a conclusion is made to obtain information from the observations made. In this study, the direct observation process is carried out by looking at the conditions and processes that occur in the field. The interview method is a method used to obtain data by interviewing relevant sources about the object of research. In the present research, the interview method is carried out by interacting with resource through a question and answer process both with doctors and paramedics related to business processes that occur in the field.

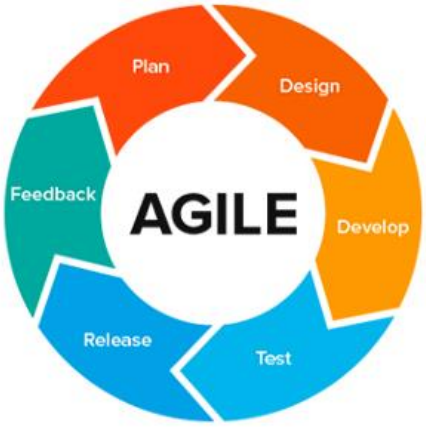

Figure 1. Agile Methodology [13].

2.2 System Development

This application was developed using agile method or agile methodology. This method is one of the methodologies used in software development. The agile method has the meaning of being light, free to move quickly, and alert. Understanding the agile method is beneficial for rapid adaptation in short-term development that allows changes and intense communication with users so that changes can occur frequently, especially regarding functional requirements of the system. The agile method concerns the interaction between teams/individuals in tools processing, software as complete documentation. Collaboration with clients is more important than contracting, and responsiveness is more important than following a plan. In general, the agile development methodology has stages as shown in Figure 1. There are several stages in the system development process

2.2.1 Planning and Analysis

Planning is an early stage of the agile method, which is in the process of developing a Web-based Home Care service application. At this stage, data was collected to be used in the process of developing a Web-based Home Care service application, so that at the next stage will be easier because the data has already been collected. The analysis stage is the stage determined the user of Web-based Home Care service application, the ability Web-based Home Care service application, accessibility of the Web-based Home Care service application. In this stage, improvements are made, and the concept of a Web-based Home Care service application is developed.

2.2.2 System Design

The system design process includes business processes, database design, and interface design. The business process design process that occurs in the system uses the Unified Modeling Language (UML). According to [14] UML (Unified Modeling Language) is a modeling 'language' for systems or software with an 'object-oriented' paradigm. Modeling is used to simplify complex problems so that they are easier to learn and understand. UML is a modeling method that applies object-oriented concepts. Modeling languages can be used by humans or machines to make it easier for developers to discuss the design of the system with a modeling language that can be understood. The type UML can be divided into several parts, namely, Use Cases, Activity Diagrams, Class diagrams, and Sequence Diagrams. Use case has three actors, namely admin actor, medical actor and user actor (common actor/from the community). Each actor has similarities and differences in features User actors can register, manage patient lists, request health services, provide order assessments, and cancel order requests. Medical actor can manage service fees, receive service requests, clarify service fees and view ratings from users and Admin Actors can manage service lists, service fees, and can also view ratings from users. While the features that can be used together are login and personal account information management. For more detail can be seen in Figure 2.

The database design process uses 16 tables. The database is a container of data to be processed from a system, besides that the database also contains data settings such as data types and the number of characters that can be stored so that the container in the database does not lack or exceeding its capacity because it will have an impact on the use of storage on the server. Likewise, with this health service application, the use of the database aims to meet the needs of the system and users in particular. The first stage of designing this database is to design type of data used in health service applications along with their analysis then implemented with software that supports the making of database.

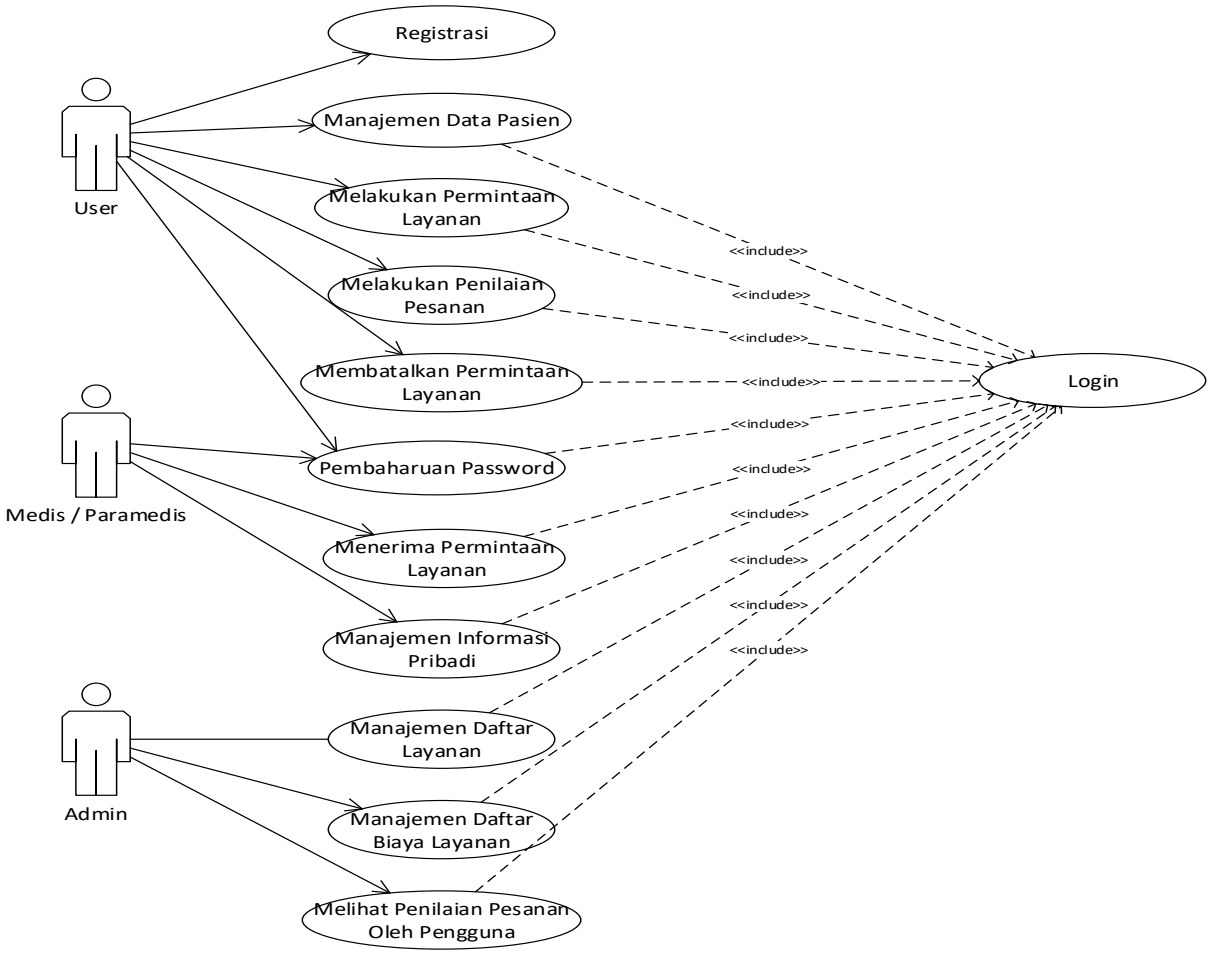

Figure 2. Use Case Diagram Home Care.

The Development of health service application uses the XAMPP application that has been synchronized with the database management system or DBMS. In DBMS there is a table to store a particular feature or piece of data. The tables used in this application are Table cart, *dd_desa, dd_kota, dd_kecamatan, dd_provinsi, invoice, layanan, lay_ob, obat, ongkir, pasien, pengguna, pesanan, pesanan_obat, riwayat dan ulasan*.

Interface design is a basic illustration of the page display of a system or application. The simplest interface design is in the form of a black and white sketch or commonly called a wireframe with a rough depiction and not much different from the implementation process. In order to make interface design faster, you can use applications that support the creation of interface designs, both online and offline applications. The interface design of this health service application has 3 special designs, including the design of the admin interface for medical personnel and the user. The general interface design is a design that can be accessed by medical personnel and users such as login, activation and forgotten password pages. The interface designed includes registration, login, user, service, patient, detailed history, and reviews from users, and payment.

2.2.3 Implementation and Application Testing

This stage is the stage where the web-based home care service application is implemented and tested to ensure its performance is in accordance with the initial designed. The process of making and developing web-based home care service applications must use supporting applications. The function of each supporting application used is different and will adjust to the required needs. One of the main applications used is CodeIgniter. CodeIgniter is a framework used to build dynamic PHP applications. CodeIgniter is a PHP framework with an MVC (Model, View, Controller) model that is used in building dynamic websites using PHP which can speed up programmers to create a web. Besides being light and fast, CodeIgniter also has complete documentation and is accompanied by an example of the code implementation. This complete documentation makes CodeIgniter the framework of choice. In the case of this health service application, CodeIgniter will be used as a framework to create the design of the Web-Based Home Care Service Application. Then in the implementation of the database using MySQL which is a free and quite powerful database.

After carrying out the implementation in accordance with the interface design, database design, and business processes so that the system can be implemented according to the plan then it proceeded to the next process that was to test the product. If the system was unsuitable, the process would be repeated from the initial stage. Checks were carried out repeatedly to ensure there were no errors and unwanted things found. The web-based home care health service application was tested by Black Box and White Box testing.

2.2.4 System Maintenance

Maintenance is the stage where the maintenance of the system is carried out. This stage is part of the application/software development life cycle because it takes the longest time due to maintenance which includes fixing errors or bugs that were not found in the previous stage, as well as developing and adding new features that can help this application.

2.3 Patient Data Management

This stage is the main focus in developing this home care service application to ensure that it can run well. The points were that system is user friendly, users feel comfortable and easy to access services. That is the core of the development of this system. The services provided for the patients is shown in Table 1.

Table 1. Patient Management in Home Care

No	Proses in System	Description
1	Registration	Patient registries himself for login
2	Login	Login with user and password
3	Accessing home page	Patient access the home page
4	Service request by User	There are several steps needed to make a service request including: first is adding patient data in the menu, second is adding the request service to the cart, third is entering the service requestform.
5.	The process of adding patient data	Patients requests for health services. If there are no patients, the service provided by the application cannot be ordered.
6	The process of modifying	User does not need to delete and then recreate the error-inputted data because

No	Proses in System	Description
	patient data	this application has a feature to edit data so that the has been in inputted can be changed if an error occurs.
7	The process of deleting patient data	Patient can delete his own personal data
8	The process of adding the service request	The patient performs a service request is to add the desired service request. The list of service requests will be stored in the cart / cart.
9	The process of deleting the service request	This process is intended for the user wants to cancel the list of service requests contained on the cart page.
10	The process of checkout service request	This process is the final step in making a service request. In this step, patient just fills out the service request detail form. This form contains the time of service request, address details, selecting the area and photos of the patient's condition. In this process, the user can check the area available in the service by selecting the desired area on the regional form, after that press the Check Availability button.
11	The process of cancelling service request	The process of cancelling service requests in this application aims at deleting the entire service request before it is received by medical personnel. Cancellation to prevent the user changes the service request partially because it will confuse the medical personnel who will receive it.
12	The process of changing account information	This process aims to change the personal information of the user account, namely medical personnel or from the public. Information that can be changed such as e-mail, username, profile photo, phone number, gender and password. In general, if medical personnel or users want to change their account information then they can do so in this menu
13	The process of receiving service request	This process aims at receiving service requests sent by the user. Medical personnel select the incoming service request on the order list page.
14	Other Cost Change Process	This process aims to add costs that are not listed in the payment information list. For example, when health services are in progress but require additional medicine that are not listed on the default medicine list, or suddenly a patient needs a medical device that is not on the list and requires the rental of a medical device, these costs will be included in other costs.
15	Service Payment Process	The service payment process is a transaction process between medical personnel and users using a cash on delivery system. The role of the application in the payment process is only as a confirmation of the total cost to be paid by the user.
16	Upload the payment document	The process of uploading payment document can be done in cash payment or transfer via ATM. Cash payments can be made directly by paying the medical cost to the team on duty with photo evidence at the time of the transaction. The transfer can be made by transferring via ATM to a bank account that has been informed in the system. Proof of photos can be uploaded to the link provided by the system

3. RESULTS AND DISCUSSION

Based on the process in Table 1, the implementation is carried out according to the design that has been made, both use case design, database design, and interface design. The system interface is ready and contains coding to process the input results and then perform commands according to the expected function. The display of the service request process can be seen in Figure 3.

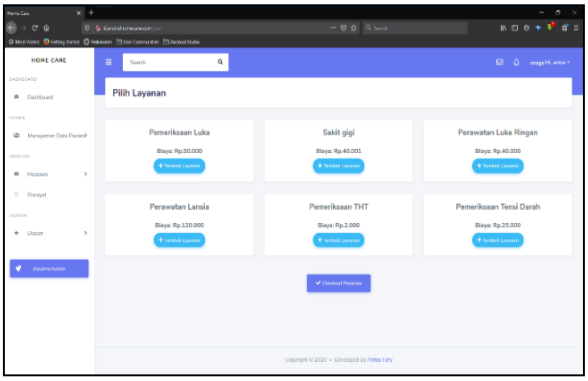

Figure 3 Proses of requesting service.

The process of ordering services is done by entering the desired service into the basket as shown in Figure 4, then waiting for confirmation from the home care team who will pick up and perform the service.

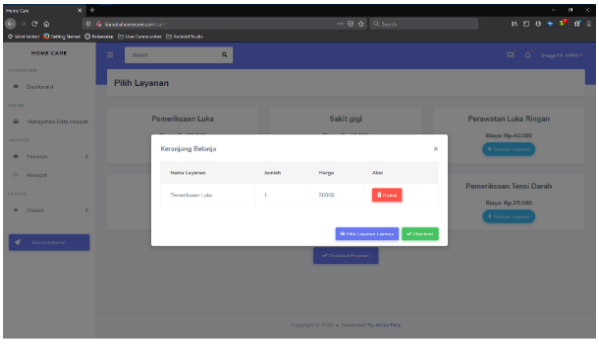

Figure 4 Adding the service request into basket to be processed.

From the process of ordering process until the patient gets treatment, the patient can provide comments and messages about the services that have been carried out. It is very important for application and system developers to improve services according to patient needs. Patients gave ratings to services which can be seen as shown in Figure 5.

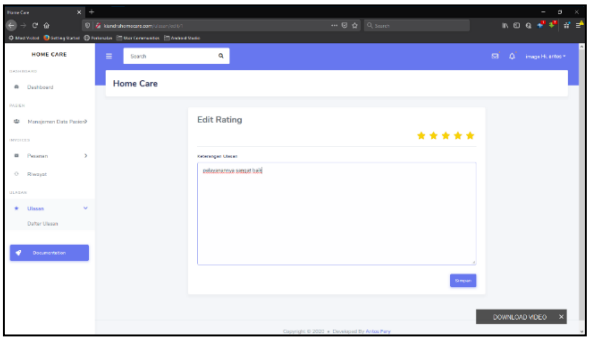

Figure 5 Patient rates the service by giving star to the *Home Care* service.

Program testing is one of the important things that must be done in developing health service application. The testing process is carried out using the Whitebox testing method for the Alpha Testing process and Blackbox for the Beta Testing process on a small scale. This test is carried out to determine whether this health service application has been made in accordance with the system design made. The implementation process of patient data management has promising progress from the initial stage (phase 1) of Alpha Testing to completion (phase II) of the Beta Testing stage based on the process in Table 1 as shown in Figure 6.

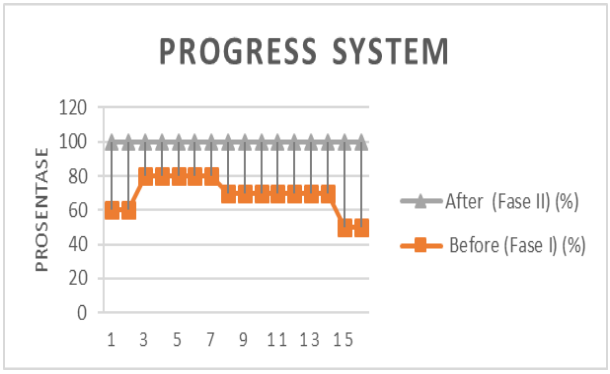

Figure 6 Development Progress of the System.

Through the process Alpha and Beta Testing, we get the results that the system can run well, seen on the progress system in Figure 6. All processes in Table 1 can run well with testing from 2 content experts by 80%, and testing of 2 web experts generates a score of 85%. This value range based on the assessment [15] is in the Good category.

4. CONCLUSION

This Health Service Application is an application that is used to requests for health services that aim to make it easier for the people without the need to go to a hospital or health clinic. With home care application, people can ask for services through gadgets and after being received by medical personnel, people just wait for the arrival of medical personnel who will come to the house. The process of designing this health service application starts from making UML (Unified Modelling Language) such as use cases diagrams, activity diagrams and sequence diagrams. In this application there are 3 actors, namely admin, medical personnel and patient users. The admin actor generally manages service data, drug data, shipping cost data, then medical personnel actors in general are in charge of receiving service requests and managing service costs. Meanwhile, user actors are generally tasked with sending service requests and paying fees with certain procedures. The process of system implementing, this health service application uses a website that uses the CodeIgniter framework. The programming language used to create the model is PHP which is assisted by the

CodeIgniter framework. Database was processed using MySQL contained in the XAMPP application. The result of this implementation process is a health service application called home care, whose features have been adapted to the initial system design. The application was categorized as good.

It is hoped that this application help developing health care facilities for the community without the need to leave the house or come to health facilities. Patient just have to stay at home or access the application to get health services. Due to the complexity of the problems in developing this application, further development is urgently needed, for example connecting the login process with social media accounts or emails so that there is no need to register again in the system. In the transaction development process, it needs to be further developed to be connected with direct payments through the GoPay payment application, Dana or OVO. This system continues to be refined to be used in accordance with health service standards. The most important part now is on the management of patient data. This health application developed so that it can be more useful for the health industry in Indonesia, helping to connect services between users and the home care team to provide maximum service to the community. Besides the other factor in determining the success of the application is the competence and knowledge possessed by home care employees, courtesy, friendliness, attention and employee attitudes that can be detected from the ratings given by patients in menu reviews.

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