



Making Applications for Midwives' Independent Practice Using the Waterfall Method

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Received: 01-04-2023. Reviewed: 15-04-2023. Accepted: 30-04-2023

Abstract

The patient's medical records at the Independent Midwife Practice (PMB) must be stored and kept confidential in order to provide good, quality, and responsive health services to patients. Midwife Independent Practice Nuning, S.ST. Tanah Bumbu was founded in 2012. During its 11 years of existence, patients still have to queue in the waiting room for a long time. This is because the service process and medical records used are still manual. This study aims to make a special application on PMB. Researchers use the research and development method to facilitate the research process and the waterfall method as a reference for the PMB application development process. The resulting development product is a PMB application that can provide convenience to midwives in providing services to patients and reduce the long queue of patients in the waiting room. Data collection used interviews with 2 respondents from PMB owners and midwives. The results of the research are in the form of functional and non-functional system requirements for PMB applications. These needs are translated in the form of system design in the form of system flowcharts, use case diagrams, class diagrams, activity diagrams, entity relationship diagrams, and data flow diagrams. The design is then translated into a programming language using PHP programming and MySQL database. From the results of this study, it has several features, namely login features, patient visit report features, patient referral letter features, detailed identity data features for patients and midwives, notification features, patient registration/registration features independently, and patient examination results record features. Features that are not yet available in the PMB application are the automatic payment feature and the distance between the PMB and the referred hospital.

Keywords: Application, Medical Record Data, Midwife Independent Practice

Introduction

Midwife Independent Practice Nuning, S.ST. Tanah Bumbu still uses manual registration, but the manual registration is contained in the ANC, immunization, and family planning (KB) informed consent sheets, so that only a few patient identity items are recorded, namely the wife's name (patient), age, husband's name (if married/married), wife and husband's occupation, patient's blood type, and patient's complete address (Anggraini et al., 2022). The sheet also contains the patient's medical history, obstetric history (OBS), date of last birth control injection, LiLa (upper arm circumference), TB (height), TP (predicted delivery),

HPHT (first day of menstruation and last day of menstruation), GPA (gravid , parturition , and abortion), and the last TT (tetanus toxoid) (Khumoetsile Daphney et al., 2023). The informed consent sheet still does not contain the patient's medical record number and patient population number, so the patient's medical record file storage system only uses the letter prefix of the patient's name and patient data research in the register book still uses the patient's name in an unordered manner (Etowa et al., 2023).

Researchers also found old patient files that were not stored on storage shelves, these files were sometimes not regenerated (Niu & Romauli, 2023). In the immunization informed consent file, numbering is used sequentially, but there are double numbering and some even do not have serial numbers, so officers still have to use the patient's name (infant) and the patient's mother's name to search for the patient's file (Hayes et al., 2023). Time to wait in line between patients relatively long because it depends on the complaints felt by the patient himself. In the register book, the officer must report the patient data to the Health Center by taking a photo of the patient data in the register book (Luh Mertasari & Made Juliani, 2022). Based on the problems above, the researcher took the title "Making Applications in the Midwife's Independent Practice Using the Waterfall Method".

Literature Review

Health services have several services, one of which is midwifery services which can only be performed by professional midwives where these services can be carried out either independently, in collaboration, or as referrals to the nearest hospital (Rangkuti et al., 2022). As stated in the law, midwives can provide midwifery services. Independently by carrying out midwifery practice activities that have been listed in regarding midwifery practice which states that midwifery practice is an activity of providing services carried out by midwives in the form of midwifery care. (Algifnita & Diah Wittiarika, 2022)

All midwifery services provided by midwives to patients at PMB can have good quality service management by managing patient data and being integrated with each other (Leli et al., 2022). Therefore, before midwives provide examination services to patients, patients must first register/register for administrative purposes and to make reports on the number of patient visits (Gaucher et al., 2022). There are 2 ways to register/register, namely manually and electronically. Electronic registration requires an information system that can be used to facilitate medical record officers and midwives on duty at PMB in processing visiting patient data. Electronic registration can be carried out by the patient independently (Suswati & Gajayana Malang, 2022). This has been mentioned in research which states that the registration information system can be used to collect data on old patients and new patients, both outpatient and inpatient as well as emergency departments and can be used to determine the number of patient visits so as to provide convenience in making reports and presenting data. outpatient especially the number of polyclinic visits (Anggraini et al., 2022).

Research methods

This research method uses research and development with the waterfall development method in the form of making applications on the Midwife Independent Practice and the data collection method uses the interview method. The interview process in this study was addressed

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to 1 midwife owner and 1 midwife officer and 5 patients who visited the Nuning Midwife Independent Practice Nuning, S.ST. Seasoning Land.

Waterfall method

The waterfall method (waterfall method) is often called the classic life cycle, the naming of this model is the "Linear Sequential Model", this can describe a systematic and sequential approach to software development, starting from the specification of user requirements then continuing by going through the stages of planning (planning), modeling (modelling), construction (construction), and handing over the system to the users (deployment), which then ends with support for the complete software produced (Masruroh et al., 2022).

a. Requirements

At this stage it requires communication between system developers and users who have the goal of being able to understand the software required by the user and the limitations of the software. The information that has been obtained is then analyzed to obtain the data needed by the user.

b . Design

At this stage, the developer makes a system design (design) that can help determine the hardware (hardware), the requirements of the system to be made and assist in defining the overall system architecture.

c. Implementation

At this implementation stage, the system was first developed from a small program called a unit, then it can be integrated in the next stage. Each unit is developed and tested to find out the functionality which is referred to as unit testing.

d. Verification

The system must be subject to verification and testing, can the system fully or only partially meet the system requirements? Testing can be categorized into unit testing (performed on specific code modules), system testing (to see how the system can react when all modules are integrated) and acceptance testing (performed with or on behalf of the customer to see if all customer requirements can be met or not) . .

e. Maintenance

The finished software is run and carried out maintenance including fixing errors that were not found in the previous stages.

Needs Analysis

In this study, researchers collected data through interviews and literature studies by collecting literature data from books, journals and other scientific works. Respondents interviewed in this study included PMB owners and midwives and patients.

The functional requirements needed when creating an information system for the Midwife Independent Practice are:

- a. The system provides login facilities for users (users).
 - 1) Each user is equipped with a username and password to distinguish access rights.
 - 2) The owner of the Mandiri Midwife Practice has the highest access rights in the information system.
- b. The system is able to input patient identity data.
 - 1) The user (patient) can enter patient data containing the patient's name , gender, address, religion, date of birth, telephone number, blood group, husband's name, and mother's name.
 - 2) Users (patients) can determine the type of service to be performed.
 - 3) The user (midwife) is able to correct incorrect medical record data.
 - 4) The user (midwife) can delete medical record data that has errors.
 - 5) Users (patients) are able to enter new and old patient data.
- c. The system is capable of inputting data on inspection results.
 - 1) The user (midwife) is able to input patient examination data.
- d. The system is able to display a list of patient medical records.
 - 1) Users (midwives) are able to display a list of patient medical records according to certain categories.
 - 2) The user (midwife) is able to determine which category to choose.
- e. The system is able to create and print patient visit reports.
 - 1) Users (midwives) are able to report patient visit data.
 - 2) Users (midwives) are able to print the results of patient visit data reports.

Interview

Researchers conducted interviews with 1 midwife officer and the owner of the Independent Midwife Practice as well 5 patients who came to visit the Independent Midwife Practice, new patients and old patients. The questions asked are the information needed for the development of applications on the Nuning Independent Midwife Practice (PMB). Nuning, S.ST. Seasoning Land.

Application Design

In making programming, a design is needed which is the first step in translating various needs to be analyzed into a form that is simple and easier to understand. The design required in making PMB applications, namely Data Flow Diagrams (DFD), Entity Relationship Diagrams (ERD), PHP, XAMPP, relation tables, Use Case Diagrams, Activity Diagrams, Flowcharts and Class Diagrams. The following are pictures of the design required by making the PMB application made by the researcher. (Latif et al., 2022)

Results and Discussion

PMB Application Implementation

After the researcher finished making the PMB application, the researcher implemented the various features in the application.

a. LOGIN and DASHBOARD

Midwives can use usernames and passwords that have been made by midwives themselves and patients can use NIK according to each patient's KTP and use a password

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according to the medical record number that has been determined by the PMB application so that it can make it easier for patients to log in to their respective accounts . each and In the display of Figure 7, the PMB application dashboard has features that can be used by midwives in providing administrative services and making patient visit reports as well as information on the number of patient visits based on the type of service both in numbers and percentages over a period of time which can be determined by midwives, and can immediately make referral letters for patients who need intensive care by obstetricians at the hospital.

b . MIDDLE OFFICER ACCOUNT

This section is a table view of midwife data which has the feature of adding midwife data, an edit button, a delete button, a search column, and a column for the amount of data you want to see. In the table there are components of the midwife's name , username, and the date and time it was made the midwife's new account . So that if midwives want to access the PMB application, midwives can use their respective accounts that have been created. After filling out the form to add the midwife account , the midwife who created the new account can immediately press the submit button, the name of the midwife will immediately appear in the table listing the names of the midwife and a notification will appear when successfully adding a new account for the midwife, which also has the date and time to add patient data.

c . PATIENT ACCOUNT

This section is a table display of patient data for which an account has been created by the midwife so that the midwife can store patient identity data and find out the number of patients who already have an account from the PMB application. In this display there is a button to add patient data, a search field, and the amount of patient data that the midwife wants to see, as well as a delete button and patient data details.

In Figure 11, this feature is inputting patient identity data, namely medical record number, NIK, patient's full name, password using medical record number, patient's full address, religion, cell phone number , place of date of birth of patient, husband's name, mother's name, place of birth date of husband/mother, gender, and type of service.

After the midwife clicks the save button, the patient's identity data will change and a blue notification of the date and time of the patient data change will appear, which means that the identity data that has been changed by the midwife has been successfully edited and saved in the PMB application. If the midwife wants to look back at the results of the examination, drug prescriptions and the date of the patient's return visit, they can press the details button.

After the midwife examines the patient who visits the PMB and has input the results of the examination, drug prescription, and date of return of the patient's visit, the input results will be recorded in the patient data detail feature.

d. MEDICINAL RECIPES

In the PMB application that has been made by researchers, it features data on drug prescriptions that are often given by midwives to patients according to the type of service. The following is a display of drug prescription data in the PMB application.

e. DATA OF OBSTACLE DOCTORS IN HOSPITALS

This section is an additional display of obstetrician data from the intended hospital for patient referrals. The data needed is the name of the doctor and the name of the hospital where the doctor is assigned.

f. REGISTRATION TRANSACTION

This section is a special feature for patients who have registered/registered independently to carry out examinations at PMB so that midwives can find out patients with queue numbers and what type of service will be provided to patients. On the examination button there is a patient examination form so that the midwife can input all the examination results data that has been given by the midwife to the patient and will be stored in the examination database and can be viewed again in the detailed patient data feature on the midwife's account and the examination results feature on the account patient.

The display of transaction features contained in the patient examination results form, so that after the midwife gives a medical examination to the patient, the midwife can record and store the results of the patient's examination on the form. After the midwife inputs the results of the patient's examination, the midwife can immediately press the submit button to save the data on the patient's examination results in the PMB application database and in Figure 17 above is a display of the transaction feature which contains the patient examination results form, so that after the midwife gives a medical examination to the patient, the midwife can record and store the results of the patient's examination on the form. After the midwife inputs the results of the patient's examination, the midwife can immediately click the submit button to save the patient's examination results in the PMB application database.

g. NOTIFICATIONS

Display of patient visit notifications contained in the midwife's account . This notification is useful for informing midwives that there will be patients who will carry out examinations at PMB Nuning Nuning , S.ST.

h. PATIENT REFERRAL

In the PMB application that the researchers created, there is a patient referral feature so that patients who require more in-depth action can be directly administered by the obstetrician according to instructions from midwives who have collaborated with obstetricians at the hospital. Patient referral components, namely: name of the obstetrician and the hospital where the obstetrician works, full name of the patient, age, gender, address, history, physical examination, provisional diagnosis, actions taken by the midwife, and the reason for being referred , signature of the midwife who referred the patient, the date and place referred, as well as the name of the midwife who referred the patient to the obstetrician at the hospital.

After the midwife inputs patient data and examination data that has been given to the patient for referral, the midwife can immediately press the submit button to save the patient data to the PMB application database. Then a printed patient referral display will immediately appear, so the midwife can print the referral patient data to give to the patient so that the referral letter can be directly given by the patient to the obstetrician at the destination hospital. The following shows the results of patient referral letters that have been tested by researchers in the form of PDF files on the PMB application.

Conclusion

With this system, the midwife can input the results of the patient's examination, so that the midwife can see the patient's examination results form, so that after the midwife gives a medical examination to the patient, after that if the patient wants to make a referral it will be easier and faster due to the PMB Application feature there is already data on obstetricians who are in the hospital because they have collaborated.

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