

Medical Record System in Cihampelas Health Center Bandung Barat Regency

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Abstract— The medical record system is a system that aims to manage the data of patients who register for treatment until the patient leaves from the public health center. The designed system is very important because to prevent the occurrence of procedural errors in the implementation of data registration and management so that it can be done as well as possible. The management of patient data at Cihampelas Public Health Center in Bandung Barat Regency is still not effective because the training in the system that is used is still lacking, it because the application seems to be unusable. In this research is shown that medical record can handles digital medical record, so that the historical of patients is available to access anytime.

Keywords— *medical record; ICDX; system; public health center.*

I. INTRODUCTION

The Pusat Kesehatan Masyarakat (Puskesmas) is the health service provider that is closest to the community with several types, namely the village, sub-district and district health center [1]. Cihampelas Public Health Center has used a system provided by the Bandung Barat Regency Health Office in carrying out several administrative activities at the Public Health Center, one of which is making medical records for patients [2]. The patient's medical record data can be used as a reference for subsequent patient health examinations, as well as recorded evidence of the diagnosis of patient's disease and medical services obtained by the patient [3]. In the field, the employee concerned with the system cannot use several functions in the system because the system is difficult to use so that in the administration process of patient registration, the employee has used the system while for the diagnosis of patient disease in medical records and administration of ICDX codes for Every medical record that has been filled with employee diagnosis still uses the manual method by writing a medical record form. The coding of diagnoses with ICD-10-GM is of great importance for hospitals in Germany today [4]. The problem is that employees who still cannot use the existing system due to lack of training and some features that do not exist in the system to facilitate business processes in the health center, it is necessary to design an electronic medical record system that can record, recap, analyze and report medical records effectively and efficient.

II. TERMINOLOGI AND DEFINITION

In the explanation of Article 46 paragraph (1) of the Medical Practice Law, what is meant by medical records is a file containing notes and documents about patient identity, examination, treatment, actions and other services that have been given to patients [3] [5]. The study ever evaluate the current PHC services in Riyadh city from the perspective of patients and to explore the obstacles that may affect patients use of it [6]. The Waterfall method is a structured and sequential software development model starting from problem determination, needs analysis, design implementation, integration, system testing, software placement and maintenance. This method requires a systematic and sequential approach in software development and is usually called the classic life cycle, starting from the system level and progress through analysis, design, coding, testing and maintenance.

Unified Modeling Language (UML) is a standard language for writing blueprint software. UML can be used to visualize, determine, build, and create artifact documents from an intensive software system. UML is divided into several components. Use Case Diagram basically describes the behaviors possessed by the system under various conditions when the system responds to requests from one person who has an interest in the development. Class-based modeling basically shows objects that will be manipulated by the system/software, showing operations that will be applied to objects to produce certain effects on object manipulation, showing relationships between objects, and showing collaboration that occurs between defined classes. CodeIgniter is a PHP framework that contains various functions/classes needed in creating a website.

III. METHODOLOGY

A. Analysis Data

A.1 Data Collection

At this stage it is intended to collect data to obtain data and information about the system running at Cihampelas Public Health Center, Bandung Barat Regency.

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Data collection techniques used are as follows:

a. *Observation*; This method is intended to observe directly the business processes and processing of existing data at the Cihampelas Public Health Center by observing directly how the system works at the Cihampelas Health Center in Bandung Barat Regency.

b. *Interview*; This method is a collection of data by means of question and answer to the parties concerned which aims to find out the business processes and problems in the system that is running, including: 1) Resource person: Administration Section, Objective: To obtain information about the business processes found in the Cihampelas Public Health Center. 2) Resource person: General Poly Doctor, Objective: To obtain information about the process and standards for filling medical records.

A.2 System Development Model

In making the software, the Waterfall Model is used. The research flow chart built in this study is as follows:

1) *Needs Analysis*

At this stage it is intended to determine the needs of the medical record system at the Cihampelas Public Health Center, both functional and non-functional needs. In this case the analysis is carried out by analyzing the system that runs in terms of the process and the documents used as a place to record the patient's medical record data.

2) *System Design*

In the system design stage is intended to make the design of the model or system design to explain the process functions performed by the system and data requirements by using the Unified Modeling Language (UML) model and supporting applications such as Astah, Balsamiq and Visio.

3) *Unit Implementation and Testing*

At this stage it is intended to translate designs that have been made into the form of software designed using the PHP programming language using the Code Igniter (CI) and XAMPP frameworks as server services. Next, test the programs built per unit or per work module. The unit test was tested, so that no error occurred and the results must be really in accordance with the needs that have been defined previously.

4) *Testing the system*

At this stage the programs that have been created and tested per unit are then integrated into a complete system and tested as a whole in order to test the level of integration between previously made units. The result of this system testing is a medical record system which is a form of system design and implementation and unit testing that has been done previously.

5) *Maintenance*

At this stage it is usually done when experiencing system changes. System changes can occur due to errors that appear or are not detected when testing or software must adapt to the new environment.

B. Stage Requirements/Analysis

B.1 User Needs Analysis

Users in a computer system are an integral component. With an optimal computer device with user knowledge of the operation of the software, it will be able to help speed up the work of the system user.

This Medical Record System will be used by public health center staff, especially administrative officers and poly officers to assist the recording, recording, medical record analysis and reporting process.

B.2 Functional System Analysis

System functional analysis modeling in this study will be described by modeling UML (Unified Modeling Language). Based on their needs, the system that will be built consists of several main functions, namely managing patient data, recording and reporting.

Managing patient data is a process that includes adding, changing and displaying patient data into the system. In the process of adding data entered in the form of the patient's complete biodata, changes in patient data are carried out if there is an error during the process of entering patient data. Recording is the process of entering the results of the examination into a medical record. The recording of this medical record can only be filled by the poly officer who conducts the examination. Reporting is the process of documenting an activity that occurs at a health center.

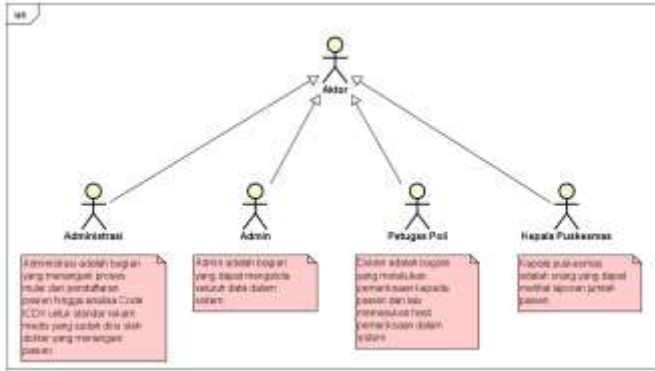
Medical Record System will be used by health center staff, especially administrative officers and poly officers to assist the recording, recording, medical record analysis and reporting process. System functional analysis modeling in this study will be described by modeling UML (Unified Modeling Language). Based on their needs, the system to be built consists of several main functions, namely managing patient data, recording and reporting. Managing patient data is a process that includes adding, changing and displaying patient data into the system. In the process of adding data entered in the form of the patient's complete biodata, changes in patient data are carried out if there is an error during the process of entering patient data.

IV. DISCUSSION

1. Served to process medical record data

The design of this new system is intended to illustrate how the system is built as a form of improvement of the current system, so a cooperative data processing application can be built that can help manage medical record data at the Cihampelas Public Health Center in Bandung Barat Regency. Business Actor description for the Medical Record System in Cihampelas Public Health Center, Bandung Barat Regency, which was obtained from the results of the current system analysis, the actor was divided into four because in the process of recording medical records occur between the patient, the administration, the poly section and the relevant drug section. Patients are people who come to conduct consultations about their health which will later be made

medical records if the patient does not have a medical record. Administration is the part that handles the process from patient registration to ICDX Code analysis for medical record standards that have been filled in by poly officers who handle patients. The poly section is the part that checks the patient directly and the results of the examination will be recorded in the patient's medical record, see Picture 1.



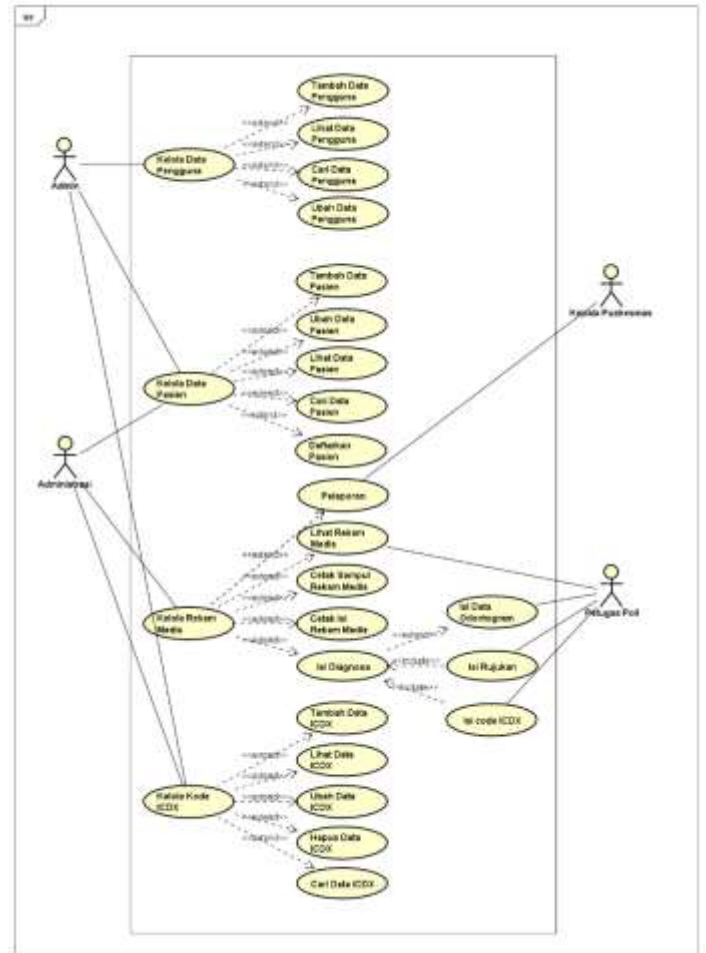
Picture 1 Business Actors

Description of this actor will explain the definition of actors in the medical record system at the Cihampelas Public Health Center in Bandung Barat Regency based on recording medical records, namely administration, patients, poly sections and medicine sections. Registration of medical records is held by the Administration because it is related to patient registration and loading of medical records. The following table will be explained in regarding the description of actors, see Table 1.

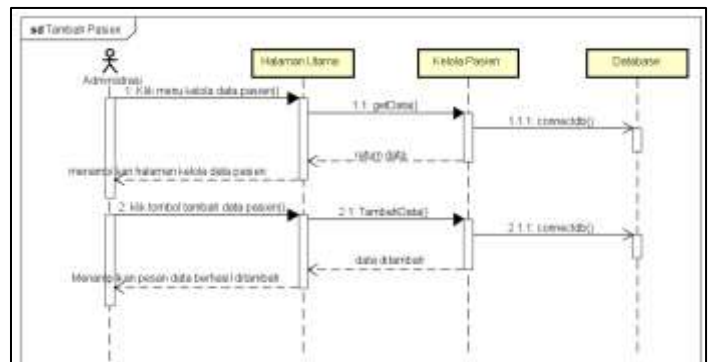
Table 1 User Description

No.	User	Description
1.	Admin	Duty to process user data and patient data
2.	Kepala Puskesmas	The head of the Puskesmas is the person who can see the number of patients
3.	Administrasi	Served to process patient data and medical records
4.	Petugas Poli	Served to process medical record data

After describe User that can be used in this case, so that it can continue with design of Use Case Diagram, Sequence Diagram and example of interface design, see Picture 2, Picture 3 and Picture 4.



Picture 2 Use Case Diagram of the system



Picture 3 Sequence Diagram of Tambah Pasien



Picture 4 Interface design of data rekam medis

2. Implementation

An action or implementation of a plan that has been prepared in a mature and detailed manner or an expansion of activity that adapts the interaction process between objectives and actions. Database implementation is built based on the database design that has been created. The database is implemented using MySQL software.

The application display is an interface to make it easier for Users to use the system, it can be seen at Picture 5, Picture 6 and Picture 7.



Picture 5 Login Page Interface



Picture 6 Dash Board System



Picture 7 Interface of Kelola Data Pengguna

3. Testing

Tests in this case are described are the stages of testing, grouping the process of medical record system interaction at the Cihampelas Public Health Center based on the use case, the purpose of quality testing, implementation of testing and conclusions from the results of quality testing. Testing that be used is Black Box Testing. The results of testing that has been done by entering data on each added function that exists to test the data entered in the database, change the data in the edit function to test changes in data in the database, delete data function on the system to test deleted data on the database, and test the data that has been saved appears on the system.

V. CONCLUSION

Based on the results of data collection and processing carried out at Cihampelas Public Health Center, Bandung Barat Regency, several conclusions can be drawn, namely:

1. The previous Medical Record System at Cihampelas Public Health Center had already used a computer system, but in its implementation it was still lacking because the previous system was difficult to operate by officers so that the officers still used the manual method in writing the patient's medical record.
2. With the construction of a Medical Record System at the Cihampelas Health Center in Bandung Barat Regency, it can help Cihampelas Public Health Center staff to process patient medical record data and speed up the registration process and the process of medical record analysis at the Cihampelas Health Center in Bandung Barat Regency. Suggestions for further development in the Medical Record System in Cihampelas Public Health Center, Bandung Barat Regency are making Odontograms in dental polymers that use graphics and Javascript animation so that later officers in dental poly are easier to analyze patients. Add a list of ICDX codes so that when analyzing medical records is faster because there is no need to add an ICDX code that has not been registered and add responsive features to each table so that if there is new data, the page does not need to be reloaded.

REFERENCES

- [1] M. K. Delimayanti, “Perancangan dan Analisis Perangkat Lunak Berbasis Web sebagai Alat Rekam Medis Pasien di Puskesmas,” *Seminar Nasional Aplikasi Teknologi Informasi 2007*, pp. L37-L40, 2007.
- [2] G. Susanto dan Sukadi, “Sistem Informasi Rekam Medis pada Rumah Sakit Umum Daerah (RSUD) Pacitan Berbasis Web”, *Journal Speed – Sentra Penelitian Engineering dan Edukasi*, vol. 3, no. 4, pp. 18-24, 2011.
- [3] B. Nugroho dan H. Sri, “Sistem Informasi Rekam Medis di Puskesmas Masaran 1 Sragen”, *Jurnal TIKomSiN*, vol. 3, no. 12, pp. 49-56, 2015.
- [4] J. Stausberg, N. Lehman, D. Kaczmarek, and M. Stein, “Reliability of Diagnoses Coding with ICD-10”, *Internasional Journal of Medical Informatics 77*, pp. 50-57, 2008.
- [5] T. A. M. Alzaied dan A. Alshammari, “An Evaluation of Primary Healthcare Centers (PHC) Services: The Views of Users”, *Health Science Journal*, vol. 10 no. 2 p.15, 2016.
- [6] R. Cesnewski, L. Maldonado, L. Prine, “Community Health Centers Role in Family Planning”, *Journal of Health Care for the Poor and Underserved*, pp. 429-434, 2013.