INFORMATION SYSTEM DESIGN ANALYSIS OF INPATIENT MEDICAL RECORD FORM COMPLETENESS IN XYZ HOSPITAL

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Abstract. This study aims to evaluate and improve the information system for ensuring the completeness of medical record forms. A qualitative research method is used, with data collection through observation, interviews, and literature review. The research identifies several issues in the current system for managing outpatient medical record forms: reports on the completeness of these forms are still created manually and are not yet computerized, resulting in frequent delays. Additionally, diagnoses written by nurses or doctors are sometimes difficult to read, which leads staff to make assumptions about the intended diagnosis. Furthermore, diagnoses are not codified using ICD-10 standards.

To address these issues, the following recommendations are proposed: the hospital should implement an information system for tracking the completeness of medical record forms to improve hospital operations, particularly the reporting process. Diagnoses should be coded according to ICD-10 standards, and reporting staff should be able to complete reports on the completeness of medical record forms promptly to avoid delays. Training programs should also be conducted to enhance the quality of human resources.

Keywords: *Medical Record Completeness Information System, Outpatient Medical Records, Qualitative Research Methodology*

Introduction

The ever-increasing pace of technology development has led to increasingly fierce business competition in the world of medicine or hospitals. This requires that each hospital be able to manage data on all activities performed in order to provide quick and precise information on the basis of which decisions can be made.

A hospital as a public institution needs an information system that is accurate, reliable and sufficient to improve its services to patients. With a wide range of services, many complex problems naturally arise in the service process in the hospital. The many variables in a hospital also determine the speed of information flow required by users and the hospital environment.

The Minister of Health's Regulation No. 269 of 2008 states that every health infrastructure is obliged to maintain medical records. Medical records are files that contain notes and documents related to patient identity, diagnostic results, treatment, procedures and other services offered to patients in the health infrastructure.

Organizing medical records in a hospital includes the inclusion of patients in reporting. The services provided by the hospital service include outpatient services, inpatient services and emergency services, which also include medical and physician support services. Outpatient services are among the work units in hospitals that provide care to outpatients and whose service time, including all diagnostic and therapeutic measures, is less than 24 hours. Outpatient care is also one of the dominant areas of the hospital market and represents a significant source of funding, which is why efforts are always being made to improve the quality of service.

Data management in hospitals is one of the important components in creating an information system in hospitals. Manual data management has many weaknesses, in addition, its accuracy is unacceptable because the probability of error is very high. Mention possible missing medical records.

The data processing to prepare outpatient findings reports is still done manually. To prepare outpatient reports, medical record staff must first fill in the daily census and morbidity reports, which takes a lot of time and creates a greater burden. This naturally leads to delays in the preparation of reports.

With the support of current information technology, manual data management is to be replaced by an information system using computers. Data management will not only be faster and easier, but also more accurate.

LITERATURE REVIEW AND RESEARCH HYPOTHESIS

A. System design

is the design of the sequence of several individual elements into a unified whole and has a function.

System design can be interpreted as:

1. Post-analysis phase of the system development cycle

2. Definition of functional requirements

3. Preparation for the design of the implementation diagram

4. Describe a system to be formed

5. In the form of a description, planning and arrangement of several components into a whole.

Configuration of a software and hardware system from a single unit.

B. Understanding database

According to several experts, there are several definitions of databases, including:

1. Janner Simarmata (2007) states that a database is a data storage structure for adding, accessing and processing data stored in a computer database. This requires a management system such as a MYSQL server.

2. Anhar (2010:45) states that a database is a collection of tables that contain data and a collection of data fields or columns. The file structures that make up a database are records and fields.

C. System analysis

This analysis is required to evaluate and determine the problems that arise in order to find the right solution to solve them. In XYZ Regional Hospital, the following problems occurred in the system for calculating inpatient and outpatient costs:

1. Transaction recording still uses books as archives, so errors often occur.

2. Calculating inpatient and outpatient costs is still done using a calculator and therefore takes quite a long time.

3. Reports take a lot of time to prepare, so the information presented is less up-to-date.

D. Medical records

According to Gemala Hatta (2012:73), medical records are files containing notes and documents related to patient identity, examinations, treatments, procedures and other services provided to patients in health care institutions. According to PERMENKES No. 269/MENKES/PER/III/2008 Article 1 Paragraph (1), medical records are files containing notes and documents related to patient identity, examinations, procedures and other services provided to patients.

E. Electronic medical records

Electronic medical records are an electronic information storage system about the health status and health services received by patients throughout their lives and are stored in a way that can serve various legitimate uses" (Shortliffe, 2001).

Methodology

In conducting this research, the author used several stages or methods, including:

1. Field Research (Field Research)

Field research is research conducted by directly visiting the object under study. Field research data is obtained in two ways, including:

A. Observation

Data collection techniques by conducting research and directly checking problems from the field.

B. Interviews

An interview or interview is a method of collecting data by directly communicating with parties dealing with sales problems.

2. Library Research (Library Research)

Literature is a method of collecting data by reading and studying books or notes on data processing problems, relying on expert opinions as comparison material with the actual situation.

Software Development Methods

A. Systems Approach Method

The systems approach method used in this research is to use a structured method, namely a process of implementing a sequence of steps to solve problems in the form

of a program. The following are the foundation stones that support software development (Rogers S. Pressman, 2002:28):

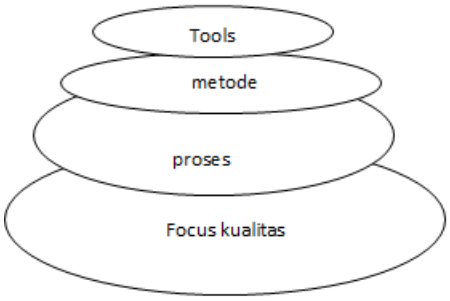

Figure 1 Software Foundation

Software development methodology (also called process model or software engineering paradigm) is a development strategy that combines processes, methods and tools.

Results and Discussion

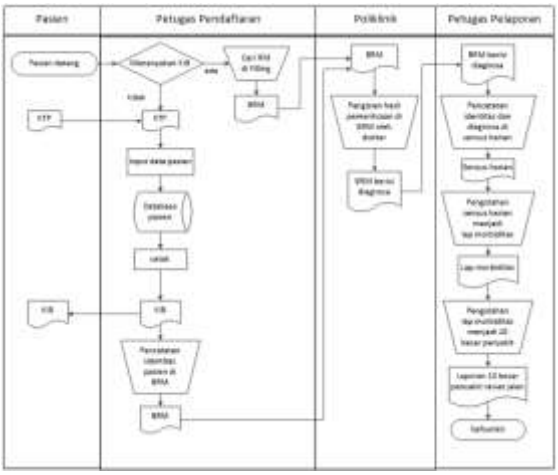

Figure 2 FlowMap of data processing for the completeness of the medical record forms being processed

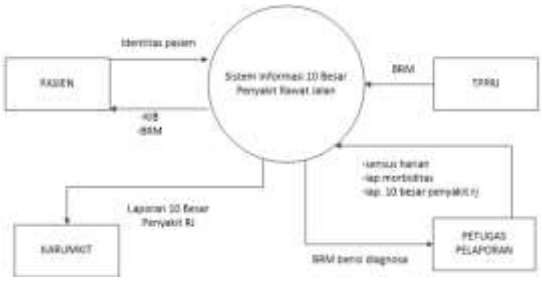

Figure 3 Diagram of the running system context

Table 1: Running the System File Dictionary

Kamus Data	
Nama Tabel : Tabel Input Data Pasien	
Keterangan : Untuk menyimpan data pasien rawat jalan di database pasien	
Struktur Data :	No RM, Nama, Tanggal lahir, Jenis kelamin, Pangkat, Kesatuan, Alamat, no telp

Table 2: Running the system file dictionary

Kamus Data	
Nama Tabel : Tabel Data Sensus Harian Rawat Jalan	
Keterangan : Untuk mencatat diagnosa pasien rawat jalan	
Struktur Data :	Tanggal, No RM, Nama, Umur, Jenis Kelamin, Golongan pasien (militer, PNS, keluarga militer, umum), Kesatuan, Diagnosa

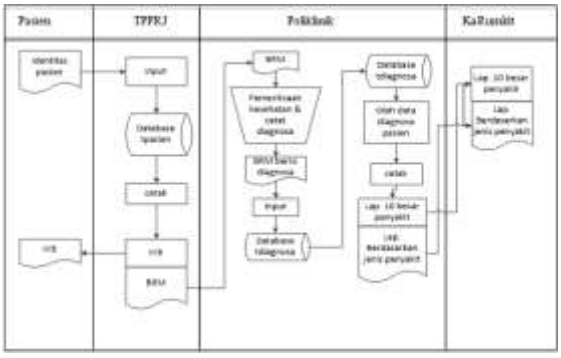

Figure 4 Flowchart of the designed system

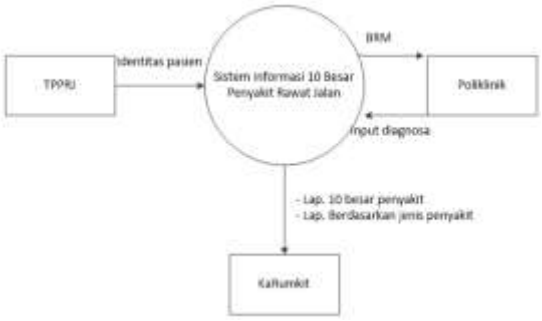

Figure 5: Designed system context diagram

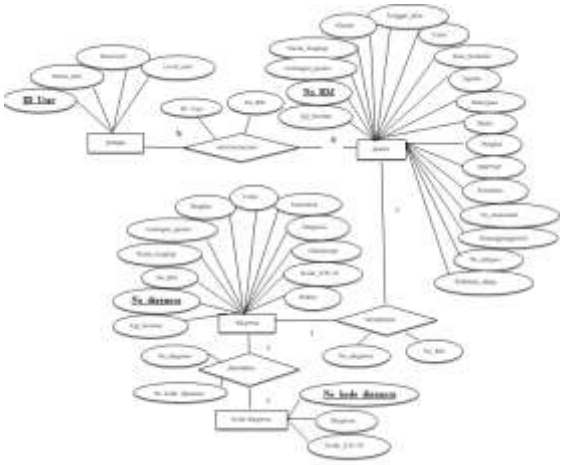

Figure 6 ERD design

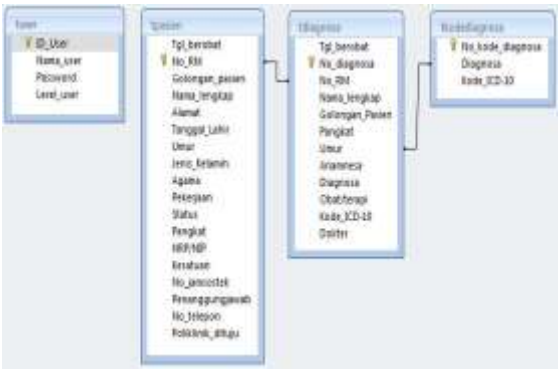

Figure 7 Table relationship schema

Table 3 User table structure

Nama	Type Data	Ukuran	Keterangan
ID User	Varchar	10	Primary Key
Nama_user	Varchar	10	-
Password	Varchar	10	-
Level_user	Char	10	-

Table 4 patient table structure

Nama	Type Data	Ukuran	Keterangan
Tgl_berobat	Varchar	8	-
No_RM	Char	8	Primary key
Golongan_pasien	Varchar	20	-
Nama_lengkap	Varchar	50	-
Alamat	Varchar	100	-
Tanggal_Lahir	Varchar	20	-
Umur	Int		-
Jenis_kelamin	Char	10	-

Agama	Varchar	10	-
Pekerjaan	Varchar	30	-
Status	Varchar	20	-
Pangkat	Varchar	10	-
NRP/NIP	Varchar	20	-
Kesatuan	Varchar	20	-
No_jamsostek	Varchar	30	-
Penanggungjawab	Varchar	50	-
No_telepon	Varchar	30	-
Poliklinik_dituju	Varchar	15	-

Table 5 Diagnosis table structure

Nama	Type Data	Ukuran	Keterangan
Tgl_berobat	Varchar	8	-
No_diagnosa	Char	10	Primary key
No_RM	Char	8	-
Nama_lengkap	Varchar	50	-
Golongan_pasien	Varchar	20	-
Pangkat	Varchar	10	-
Umur	Int		-
Anamnesa	Varchar	100	-
Diagnosa	Varchar	50	-
Obat / Terapi	Varchar	50	-
Kode_ICD-10	Varchar	10	-
Dokter	Varchar	50	-

Table 6 Diagnosis code table structure

Nama	Type Data	Ukuran	Keterangan
No_kode_diagnosa	Char	4	Primary key
Diagnosa	Varchar	50	-
Kode_ICD-10	Varchar	10	-

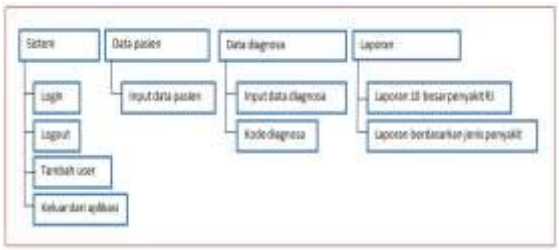

Figure 8 Screen dialog design

Figure 9: Login form design

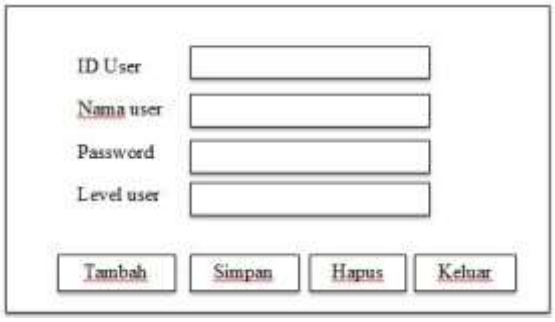

Figure 10 Add user form design

Figure 11: Main menu form display design

Figure 12: Patient data input menu display design

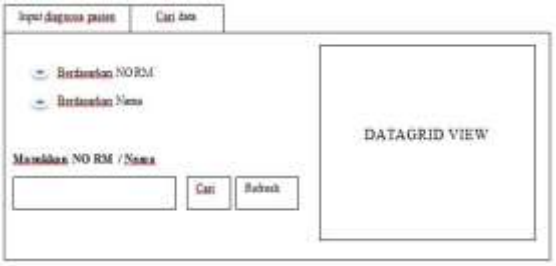

Figure 13 Patient diagnosis search display design

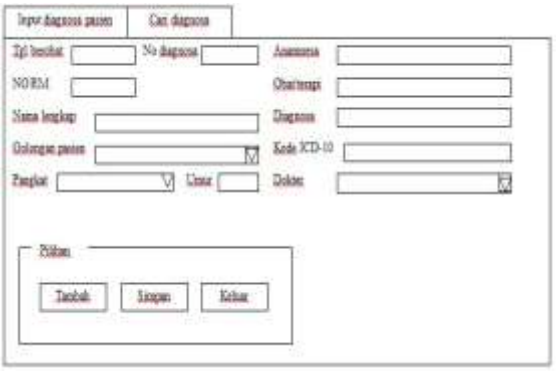

Figure 14: Patient diagnosis input display design

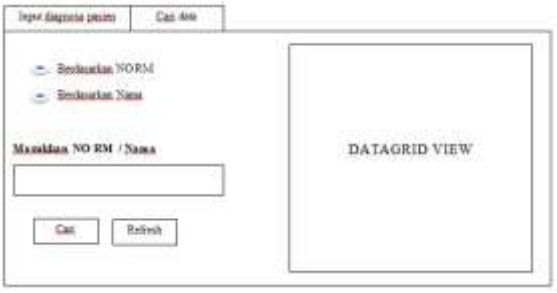

Figure 15 Patient diagnosis data search display design

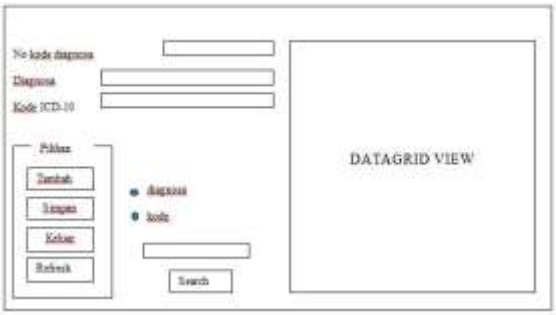

Figure 16: Diagnosis code form display design

Figure 17: Medical record form completeness report display form design

Figure 18: Report form display design based on disease type

LAPORAN 10 BESAR PENYAKIT RAWAT JALAN

Nama Penyakit	Kode ICD
ISPA	J06.9
OBSERVASI FEBRIS	R50.9
COMMON COLD	J00
FARINGITIS	J02
GASTRITIS	K29.7
DYSPEPSIA	K30
HYPERTENSION	I10
DIARRHEA	A09
DERMATITIS	L30.9
OMA	H66.9

Figure 19 Outpatient medical record form complete report design

RUMAH SAKIT CITRA HARAPAN
JL. HARAPAN INDAH RAYA, NO. 28 KOTA BEKASI

LAPORAN BERDASARKAN JENIS PENYAKIT

NO RM	Nama lengkap	Golongan pasien	Pangkat	Umur	Diagnosa	Kode ICD	Dokter
00.00.01	Untari	UMUM TUNAI		8	ISPA	J06.9	dr. Emma
00.00.04	Ahmad Basuki	KEL TNI AD	PRADA	29	ISPA	J06.9	dr. Kuncoro
00.00.06	Wawan Yahya	UMUM TUNAI		2	ISPA	J06.9	dr. Emma
00.00.08	Jumhari	PNS TNI AD	PNS III B	33	ISPA	J06.9	dr. Kuncoro
00.00.09	Dirly Shopa	KEL TNI AD	KOLONEL	17	ISPA	J06.9	dr. Kuncoro
00.00.12	Nani Dwi Astuti	PNS TNI AD	PNS II A	27	ISPA	J06.9	dr. Connie
00.00.16	Leny Afriani	KEL TNI AD	LETDA	21	ISPA	J06.9	dr.Connie
00.00.18	Kurnia Yoga	PNS TNI AD	PNS III A	20	ISPA	J06.9	dr. Emma
00.00.20	Andi Nugraha	UMUM TUNAI		14	ISPA	J06.9	dr. Emma

Figure 20 Report design based on disease type

Figure 21 Add user display

Figure 22 Patient data entry display

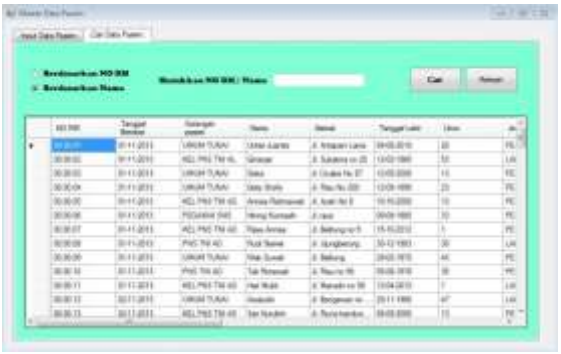

Figure 23 Patient data search display

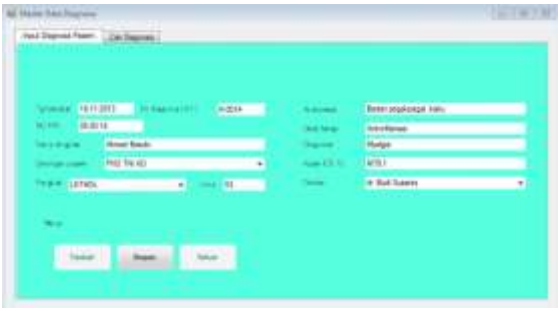

Figure 24 Diagnosis entry display

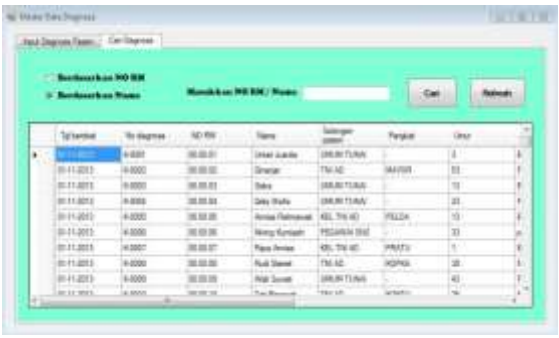

Figure 25 Diagnosis search form display

Figure 26 Diagnosis code form display

Figure 27 View form Medical record completeness report

Figure 28 Report form display based on disease type

Figure 29 Treatment record display (KIB)

Figure 30 Medical records display

Figure 31 Outpatient record completeness report display

Figure 32 Report display by disease type

Table 7 Test plan

Item pengujian	Deskripsi	Jenis pengujian
Login	Melakukan *login* kedalam sistem	*Black Box*
Form tambah user	Mengolah data pengguna sistem	*Black Box*
Form input data pasien	Mengolah data pasien	*Black Box*
Form input diagnose	Mengolah diagnose pasien	*Black Box*
Form kode diagnosa	Mengolah kode diagnose	*Black Box*

Conclusion

A. Procedure flow for designing an information system for completing outpatient medical record forms in XYZ Regional Hospital using multi-stage prototype method

B. The implementation of the information system for completing medical record forms at RSUD The aim of the created system is to support the process of patient care and ensure proper management of patient data.

Suggestion

A. The hospital needs to further develop the existing information system to support all activities in the hospital, especially reporting.

B. The patient's diagnosis should be coded using ICD-10 so that the reporting results are more accurate.

C. To optimize the reporting activities, especially reports on the completeness of outpatient medical record forms, the design of the information system for the completeness of outpatient medical record forms created by the author can be continued by creating or designing a program to speed up the process of preparing reports.

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