

## **ELECTRONIC MEDICAL RECORD OUT PATIENT IN UNIVERSITAS SEBELAS MARET (UNS) HOSPITAL**

**A Suryadi\*, Y W T Arif, F Y Arfannedy**

Medical record and health information Program Study in Faculty of health, University of Duta Bangsa  
Surakarta, Jl. KH Samanhudi 93, Sondakan, Laweyan, Surakarta 57147, Indonesia

\*corresponding author: [agung.suryadi@udb.ac.id](mailto:agung.suryadi@udb.ac.id)

### **Abstract**

The implementation of medical record recording at Universitas Sebelas Maret Hospital (UNS) is still manual so that there are problems in terms of management delays caused by the cumulation in the polyclinic, causing the document to not be immediately managed further after completion of the examination. The type of research carried use the method of taking observation and interview data using a cross sectional approach. The subjects in this study were the head of the medical record and outpatient officers, while the objects studied include medical records at the UNS Hospital. System development methods using the System Development Life Cycle (SDLC). Electronic medical records are obtained from the process of inputting patient data, doctor data, nurse data, polyclinic data, diagnostic data, action data, general consent data, physician assessment data, initial doctor assessment data, cppt data, patient transfer data to igd, distinctive assessment data urology, and the initial geriatric assessment that will be led into the database table. Then the data will be processed to be entered in the electronic medical record and produce an outpatient medical record form report.

**Keywords: electronic medical record, outpatient, system development life cycle**

### **1. INTRODUCTION**

Nowadays it is very closely related to the era of industrial revolution 4. The technology of information is very fast and advanced, one of which is information technology. One of the information technology in the health sector is in hospital services. Hospitals not only provide care to patients but also need medical records to provide medical information and are able to manage documents or medical record files [1]. Medical records must be made in writing, complete and clear or electronically [2].

The mention of electronic medical records (EMR) is often exchanged with computer-based patient record (CPR) to declare a computer-based system that is used to manage patient service information. Electronic medical records allow sharing information from various sources in various forms to be stored, processed, communicated and retrieved in their original form or processed form [3]. This can be used to manage medical record data in outpatient services at the Hospital.

The UNS Hospital has obtained an Operational permit and is designated as a Type C General Hospital which has 15 specialist polyclinics in outpatient services. Medical Records at UNS Hospital are still conventional because in outpatient services still use paper written by doctors and nurses. Conventional recording results in frequent errors in recording patient data because many officers are not right to read the doctor's writing, and inputting data by officers is less efficient because the polyclinic officer writes on paper then the medical record officer must re-input the computer. In addition, there is often a buildup of outpatient medical record documents during the processing of medical record data.

Research of Enny Rachmani on 2011 aims to develop a web-based medical record for leprosy in the Donorejo Keled Jepara Hospital that allows parties to carry out medical records, and display relevant patient medical record information and establish an electronic web-based model of

medical records for leprosy in hospitals Donorejo Keled Jepara has a system of alerts / reminders, clinical decision support, improved user interface so that it is easy to use and easy to synchronize data on the internet for leprosy [4].

Research of Alkhairunas Riyuska on 2015 has designed a system for identifying patient data in electronic medical records using RFID technology. The system consists of hardware in the form of RFID sensor circuits that are controlled using ATmega8535 and software in the form of Delphi 7 application software. Passive RFID tags are used as patient identity cards. The system works when the patient card is detected and the application software displays patient history data. The longest distance of the patient card that can be detected is 7 cm with the lowest frequency of 0.2 Hz. Patient data stored in the database is processed using application software. Passive ID number RFID tags are read by a personal computer using serial communication with an asynchronous transmission system which is used as a registration code for a patient's identity [5].

Research of Zulfa Reffi Subagyo on 2017 aims to develop electronic medical records for newborns at the Surakarta Panti Waluyo Hospital that allow parties to carry out medical records, and display relevant patient medical record information and form electronic medical-based desktop models for newborn baby at Surakarta Panti Waluyo Hospital.

To make an Outpatient Medical Record requires input consisting of Patient Data, Doctor Data, Data Diagnosis, Action Data, Poly Data, Investigation Data. These data will be used as input in the processing of patient data with computerization and can be accessed in other parts of the unit so that it is faster in making data. In this system the report output will be generated consisting of Patient Data Reports, Doctor Data Reports, Diagnosis Data Reports, Action Data Reports, Poly Data Reports, Electronic Medical Records, outpatient services that will be carried out in the database [6].

## 2. METHODS

The research method used is descriptive by means of a survey that is used to make an assessment of a condition and the implementation of a program in the present, then the results are used to plan the improvement of the program. The research instrument used was observation and interview with a cross sectional approach [7]. The electronic medical record system is obtained from the process of input patient data, doctor data, nurse data, polyclinic data, diagnostic data, action data, general consent data, physician assessment data, initial physician assessment data, cppt data, patient transfer data to igd, assessment data specifically for urology, and the initial geriatric assessment that will be led into the database table. Then the data will be processed to be inputted in an electronic medical record and produce reports of hangout outpatient medical record forms [8].

Research data processing in hospital management information systems can be done in several ways, namely: 2.1 *Collecting* is Collection of data submitted by patients, physician data, data diagnosis, data actions, polyclinic data, outpatient medical record data. 2.2 *Editing* is Repair the corrected data that still has errors. 2.3 *Classification* is Namely grouping the collected data in accordance with the classification into patient tables, doctor tables, action tables, diagnostic tables, polyclinic tables, outpatient medical records. 2.4 *Presenting data* that has been inputted and processed so that it uses the PHP programming language [9] and will be stored in a database that is MySQL [10] and will produce information or output in the form of patient data reports, doctor data reports, diagnostic data reports, action data reports, polyclinic data reports, medical record forms outpatient.

System development methods use SDLC which includes project identification and selection to identify existing problems, project initiation and design to understand concepts and

material related to the system, the analysis phase to gather information and identify system requirements, design, implementation and maintenance [11].

### 3. RESULTS AND DISCUSSION

UNS Hospital is the University Sebelas Maret (UNS) Technical Implementation Unit which is a supporting element of the Chancellor's task in the field of health services. The UNS Hospital has officially obtained an Operational Permit and is designated as a Type C General Hospital, based on the Decree of the Head of the Sukoharjo District Health Office Number 445/8426 / VI / 2016 dated June 28, 2016. In the initial stage, UNS Hospital opened an inpatient service with a capacity of 50 patients, a total of ten specialist polyclinics began operating at this stage. In addition, there is also an Emergency Installation facility and a Laboratory that is open 24 hours. At present, UNS Hospital has opened thirteen specialist clinics and five basic health clinics. Radiology installations and 24-hour pharmacy installations have been opened as well as emergency rooms and clinical laboratories. Current System in RS UNS (Figure 1) and System Built (Figure 2).

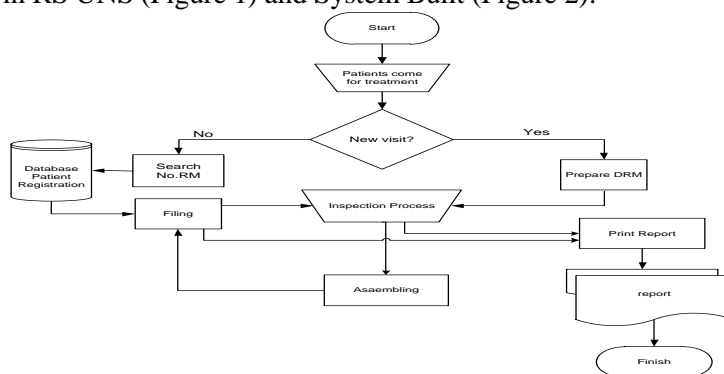


Figure 1. Flowchart Current System in RS UNS

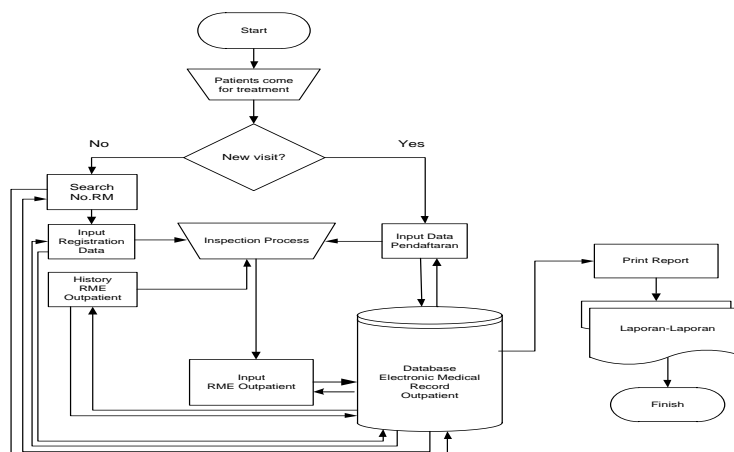


Figure 2. Flowchart System Built in RS UNS

The system design consists of Data Flow Diagrams (DFD), database design, input design, maintenance design and screen dialog design. Context Diagram (Figure 3). Table relationships In the patient table, the no\_rm file corresponds to the registration table no\_rm file, Form Tables to display stored patient data. The polyclinic table for the kd\_poli file relates to the registration table kd\_poli file and the form table to display polyclinic data. The registration table for the no\_reg file relates to the file no\_reg form table to display the registration data that the electronic medical record will take with the form table. (Figure 4).

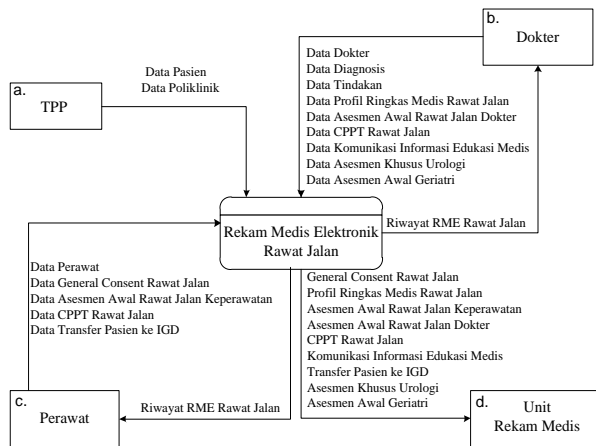


Figure 3. Context Diagram of Outpatient Electronic Medical Records at UNS Hospital

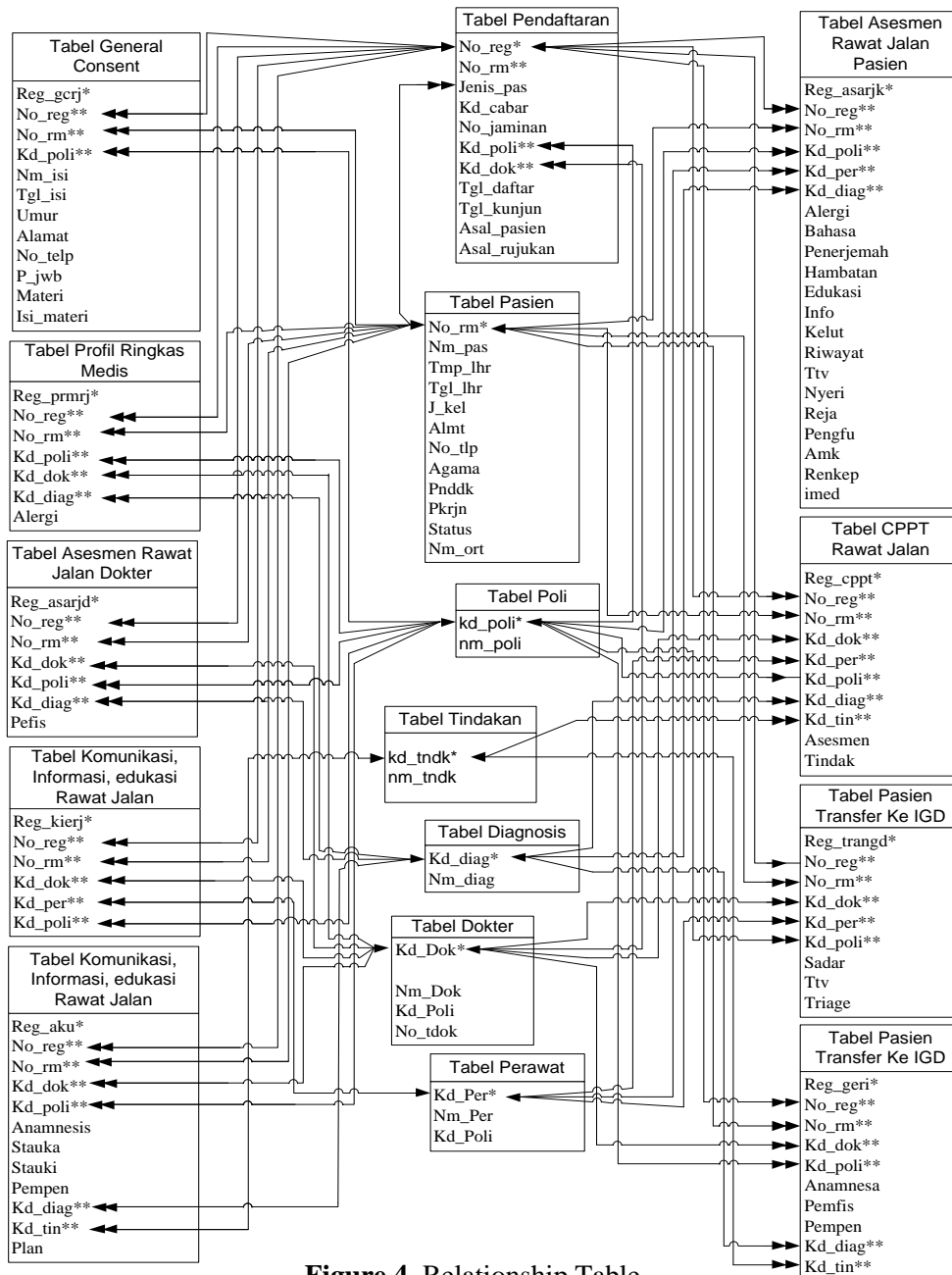


Figure 4. Relationship Table

The system was developed in the outpatient department of the UNS Hospital, namely by replacing paper forms (conventional) medical records with electronic medical record forms. Inputting the results of examinations from nurses, doctors, and the results of investigations will be done by computerization and electronics. Reading the patient's medical record history can also be seen by the doctor.

Operating the system starts with typing the url address: <http://localhost/rme/user/index.php>, then the login form will appear in the browser to enter the admin program. Display the login form as shown (Figure 5)

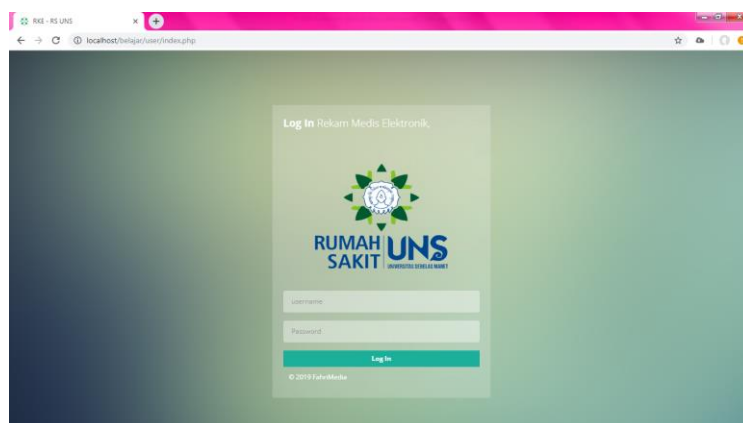


Figure 5. Login User

After the username and password are known and successful login, it will go to the main menu display which displays the outpatient Polyclinic Menu. Polyclinic Patient Menu contains a table of patient registrations in the data table, there is also a medical record button that functions to open the patient's medical record history, check button to input the patient's medical record, and delete button to delete patient data from the patient's polyclinic patient table entry Street. Display the main menu (dashboard) as shown (Figure 6)

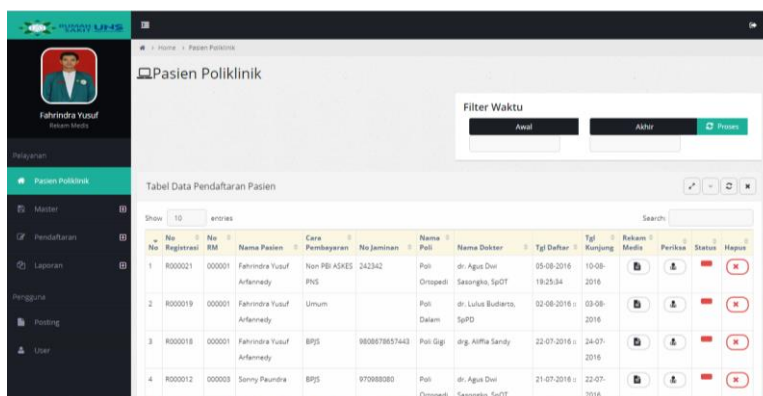


Figure 6. Main page

The main page of this electronic medical record contains several tabs which are forms that are in this electronic medical record. In general electronic medical records there are five tabs of general consent, initial nurse outpatient assessment, initial outpatient doctor assessment, outpatient cppt, and transfer. patient to the emergency room. the nurse will input the initial outpatient assessment as shown in the following (Figure 7)

Figure 7. Input Asesmen Awal Perawat

The initial appearance of the electronic medical record on the outpatient assessment tab of the doctor displays the identity of the patient just as the nurse outpatient assessment tab, but on this tab the function of the identity is to provide information to the doctor who will fill the examination entry to ensure that the data will be input is data from selected patients, in addition to the patient identity items in this tab there are also other items that must be filled by the doctor who performs a medical examination of the patient, such as anamnesis items, physical examination, diagnosis, planning, and actions taken by the doctor, the following is a display of the history item (Figure 8)

Figure 8. Tampilan Asesmen Awal Dokter

The display of electronic medical record review is useful for displaying medical record data and patient medical examination history, in this view contains the patient identity contained above from his medical record and on the right side there is a shortcut navigation to the medical record form such as the initial nurse outpatient assessment, assessment initial outpatient doctor, outpatient cppt, and transfer of patient to igd, which you want to display, along with a display of electronic medical records (Figure 9). The assessment form report is the output of the initial outpatient nurse assessment tab, the results of the nurse assessment examination can be printed using pdf files, the nurse's initial assessment as in (Figure 10). Special urology reports are outputs from the special urology assessment tab that can be printed with pdf files, can be seen as shown (Figure 11)

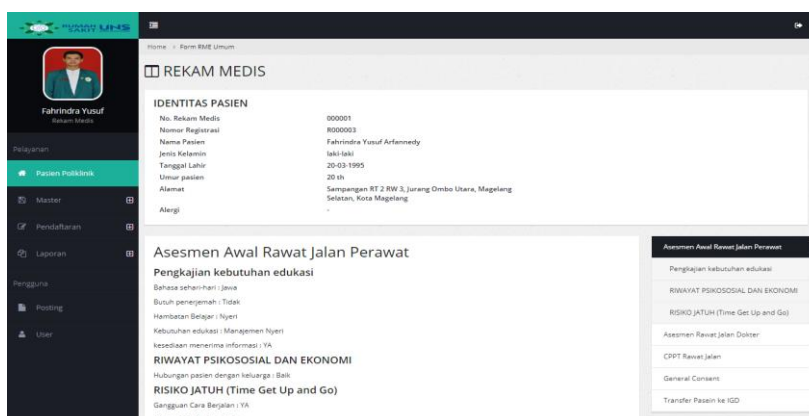


Figure 9. Review Elektronik Medical Record

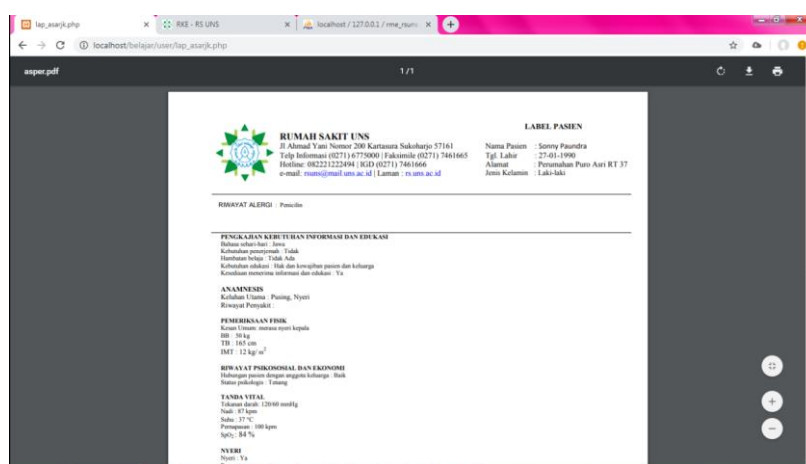


Figure 10. Report on the initial nursing outpatient assessment form

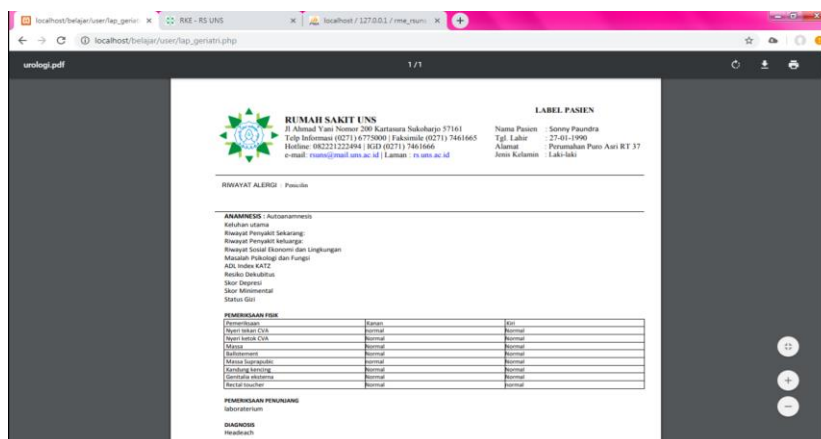


Figure 11. Urology Special Assessment Form Report

#### 4. CONCLUSION

The flow and procedure for recording outpatient medical record documents at the UNS Hospital still uses a manual system, so there are several obstacles, namely about the efficiency and effectiveness of recording outpatient medical record documents.

Electronic Medical Records designed and applied computerized consist of patient tables, doctor tables, nurse tables, diagnostic tables, action tables, polyclinic tables, and Outpatient General Consent Tables, Initial Nursing Assessment Tables, Initial Rajal Doctors Assessment Tables, Cppt

Tables Outpatient, Patient Transfer Table to ED, Special Urology Assessment Table, Early Geriatric Outpatient Assessment Table. The system is built using the PHP programming language and My Sql database. Electronic Medical Records that are built have the advantage of being able to accelerate the process of recording outpatient medical record documents

## 5. ACKNOWLEDGMENT

The authors would like thank to Universitas Sebelas Maret (UNS) Hospital for permission that has been given for this study

## REFERENCES

- [1] Minister of Health of the Republic of Indonesia 2008 Regulation Number: 269 / MENKES / PER / III / 2008 / Regarding Record of Indonesian Ministry of Health.
- [2] Republic of Indonesia Ministry of Health 2006 Guidelines for Guidelines and Procedures for Hospital Medical Records. Jakarta: Directorate General of Medical Services
- [3] Sudra, Rano Indradi 2017 Medical Record Graha Ilmu
- [4] Rahmani E, Syukur A, Mulyanto E 2011 Design of Web-based Electronic Medical Record Model for Leprosy in Donorejo Leprosy Hospital in Jepara in 2011 Dian Nuswantoro University
- [5] Riyuska A, Wildan 2016, Designing a Patient Data Identification System in Electronic Medical Records Using RFID Technology at Andalas University
- [6] Subagyo M Z R 2017, Newborn Electronic Medical Record in Surakarta Apikes Citra Medika Panti Waluyo Hospital
- [7] Notoatmodjo, Soekidjo 2010 Health Research Methodology Rineka Cipta
- [8] Riyanto Agus 2011 Application of the Health Research Methodology Nuha Medika
- [9] Nugroho Bunafit 2014 Creating a School Academic Information System with PHP-MySQL and Dreamweaver Gava Media
- [10] Madcoms 2013 Peel Finished Adobe Dreamweaver C56 with PHP & MySQL programming
- [11] Fatta Hanif Al 2007 Analysis and Design of Information Systems for Competitive Advantages of Companies and Modern Organizations C. V Andi Offset