Hamburg University of Applied Sciences

Faculty of Life Sciences

Bachelor in Health Sciences

Efficiency of patient medical record services:

An analysis of document flow at Pertamina Central Hospital in Jakarta, Indonesia

Bachelor Thesis

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Date of submission:

28.02.2017

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Acknowledgments

First and foremost I offer my sincerest gratitude to my supervisor Prof. Dr. York Francis Zöllner, who has given me the guidance and advice throughout the process of writing my bachelor thesis with his patience, knowledge and precious time as well as my secondary supervisor Prof. Dr. Christine Färber for her huge support.

My special thanks to my internship supervisor, Mr. Prasojo, SKM, who was introduced the topic of my thesis during my internship period at Pertamina Central Hospital (RSPP) and for his countless hours of helping to access the data, and most of all patience throughout the entire process. Mrs. Frieda Silaban, SKM for sharing all available data and information and made the qualitative part of my thesis possible. Thanks a lot.

I would like to thank all teachers and administrators in the Faculty of Life Sciences, Hamburg University of Applied Sciences that assisted me during my study of Health Sciences.

Overall, I thank my friends in Hamburg and Jakarta that I can't mention one by one who support me during this time and beyond showing a lot of patience towards me.

And lastly, I give all my success and achievement to my parents, Yusni Arifin Syam and Syamsu Darwis Saharuddin, who always being my forever strength to achieve my work. Also to my lovely sisters and brother for their unceasing encouragement.

Abstract

The Medical Record Unit is often the first department to introduce the quality assurance of a hospital (WHO, 2002). The professional medical records must contain all the relevant facts needed for patient care and other uses. The medical records are assembled after the discharge of the patient to facilitate the flow of patient's information regarding the patient's past and present illnesses, diagnosis, treatments and outcomes (Malhotra, 2009, p.240).

The main problem faced by the Medical Record Unit at Pertamina Central Hospital (Rumah Sakit Pusat Pertamina/RSPP) is due to the delay submission of the documents to the Medical Records Unit after discharge. Hence, this study will bring up the issues, particularly in the section that carries out the monitoring of medical records documentation of discharged patients. The purpose of the monitoring is to improve the quality of health services that are in harmony with the mission and vision of the hospital.

The aim of this study is to examine the efficiency in handling the patient medical records in RSPP. Therefore, the most appropriate analysis is through the document flow to the Medical Record Unit. The outcomes are expected to identify the problems related to the inpatients' medical record documents and to analyze alternative solutions for the problems encountered by monitoring the flow of inpatient's medical records document at Pertamina Central Hospital.

Keywords: Hospital, Medical Record Unit, EMR, Healthcare, Indonesia.

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List of Abbreviations

A&E	Accident and Emergency
ALOS	Average Length Of Stay
BOR	Bed Occupancy Rate
BTO	Bed Turn Over
CPR	Computerized Patient Record
EEG	Electroencephalogram
EHR	Electronic Health Record
EKG	Electrocardiogram
EMG	Electromyography
EMR	Electronic Medical Record
EPR	Electronic Patient Record
ICU	Intensive Care Unit
MCU	Medical Check Up
MOH	Ministry Of Health
MPI	Mater Patient Index
MRN	Medical Record Number
RI	Republik Indonesia (Republic of Indonesia)
RSPP	Rumah Sakit Pusat Pertamina (Pertamina Central Hospital)
SOP	Standard Operating Procedure
SPM	Standar Pelayanan Minimal (Minimum Service Standards)
SWOT	Strength Weakness Opportunity Threat
TOI	Turn Over Interval
WHO	World Health Organization

1. Introduction

As a public health service provider, a hospital has a primary function, which is to provide inpatient diagnostic and therapeutic services for a variety of medical conditions. To be able to deliver good public services, resources in a hospital need to be organized with proper management. Sophisticated technology and a rapid flow of information are expected to enhance patient's satisfaction with the hospital services (Griffin, 2012, p. 399). Therefore, improving and maintaining the quality of services is a key priority in the health management of a hospital.

Moreover, a hospital has a function as an institution for education, training, nursing care and administration in health service (Ministry of Health the Republic of Indonesia, 2006). Therefore, hospitals need to be well managed in order to perform properly as a public health service provider. Each service provided by the hospital comes with the responsibility to manage a reliable medical record. A medical record is defined as a clinical, scientific, administrative and legal document related to patient care in which sufficient data is written in the sequence of events to justify the diagnosis, treatment and the final result (Malhotra, 2009, p. 221). The document of medical records has to be timely, contain trustworthy information on inpatient and outpatient services, emergency services and other support services. In order to provide international standards, a hospital needs a set of medical records unit. Reference medical record is a compilation of the pertinent facts related to a patient's anamnesis and treatment prescribed by health professionals contributing to a patient's care. The medical records should be compiled chronologically and should contain sufficient data to identify the patient's needs, to support the diagnosis or the reason for the treatment, and a precise document as the final medical records (Malhotra, 2009, p. 222).

Pertamina Central Hospital (Rumah Sakit Pusat Pertamina/RSPP) was established by the initiative of the President Director of Pertamina, Lieutenant General Dr. Ibnu Sutowo in 1967 to provide and support health care for the employees of Pertamina. Pertamina itself is an oil and gas company owned by Indonesian government. In '60s and '70s oil exploration activities in Indonesia were rapidly progressive developed and followed by the increasing in number of Pertamina employees. Thus, it would require adequate facilities to support the oil operations among others as a health facility. RSPP was built on a land with an

area of 34,000 m2, which at the time was inaugurated by the second President of Indonesia, Soeharto in January 6, 1972.

One of the assets of medical records service can be seen by the submission of the medical record documents of inpatients to the Medical Record Unit within 48 hours after the patient was discharged from hospital. According to the guide book "SPM (Minimum Service Standards of Hospital)" by the Directorate General of Medical Services, the Ministry of Health in Indonesia in 2008, that the deadline to return the medical records of outpatients to the Medical Record Unit is within 24 hours, while the medical records of inpatients is within 48 hours after the patient being discharged with the standard completeness 100%.

The main problem faced by the Medical Record Unit at RSPP is due to the delay submission of the documents to the Medical Record Unit after discharge. Hence, this study will bring up the issues, particularly in the section that carries out the monitoring of medical records documentation of discharged patients. Monitoring aims to improve the quality of health services that are in harmony with the mission and vision of the hospital. To obtain the best outcomes, an overview through the background information about inpatients services as well as performance of the hospital is needed.

In a traditional medical records system, such as in RSPP, the patient's information is stored in a paper-based and filing system. To come through on the other side, the electronic medical records (EMR) has become one of the most important new technologies in healthcare. EMR mostly focuses on improvements in efficiency, patient experience and care (Mane & Kulkarni, 2012).

There is compelling argument on the benefits associated with the adoption of EMR in the healthcare industry. It is potential to improve the efficiency and quality of healthcare delivery, especially in the handling of patient medical record services (Sikhondze & Erasmus, 2016). Due to particular scenarios that exist in developing countries, the adoption of EMR systems in developing countries such as Indonesia is limited. A survey carried out by the World Health Organization indicates that South East Asia and African regions have high use of paper and shows minimal transition into electronic records (Douglas, 2009).

2. Objectives

The object research of this study focuses on "Pertamina Central Hospital Jakarta" (RSPP), a hospital which currently has medical records problem regarding inefficiency in handling medical records. The existing problem in RSPP as mentioned above, is the delay submission of the documents to the Medical Record Unit after discharge. Thus, the objective of this study is to carry out an overview and to suggest alternative solutions of the inefficiency in handling patient's medical records by monitoring those documents belonging to discharge patient at RSPP, South Jakarta in 2016.

The aim of this study is to find out about the efficiency in handling the patient medical records. Therefore, the most appropriate analysis is through the document flow in the Medical Record Unit.

The objectives of this research are as follows:

1. To identify the issues related to the inpatients' medical record documents at Pertamina Central Hospital during the 2016.
2. To analyze alternative solutions for the problems encountered by monitoring the flow of inpatient's medical record documents at RSPP.

In order to carry out this research, the sequence of chapters as follows: Chapter 2 explores the objective of the study in specific terms. Chapter 3 explains how the primary data was collected and defines the search strategy of the secondary data. Afterwards, the proposed way of using the data was explained to achieve the objective of the study. Chapter 4 informs the reader about the definition of medical records in general and the development of medical records in Indonesia. Besides, this section describes the specific information of the Pertamina Hospital. Moreover, it explains the services of the hospital, such as outpatient and inpatient services. It also portrays the performance of the hospital by using the following indicators: Bed Occupancy Rate, Average Length of Stay, Turn Over Interval and Bed Turn Over. Chapter 5 explains the result of analyzed documents flow in the Medical Record Unit at Pertamina Central Hospital, including a short description of the organization stucture, job description, and workforce of Medical Record Unit. It also describes the major problems' causes,

as well as analyzes the accuracy of the alternative solutions by discussing the strengths, weaknesses, opportunities and threats (SWOT) of each solution. Chapter 6 discusses the most accurate alternative solution and analyzes the long-term implementation of electronic medical records (EMR) in RSPP. Chapter 7 offers the conclusion and outlook.

3. Material and Methods

This study is a descriptive analysis of the monitoring inpatient's medical record documents at the Pertamina Central Hospital (RSPP). Acting as the main resource information for this study is the Medical Record Solution Team of RSPP. Qualitative research methods are adopted.

Primary data were obtained from expert interview and direct observation (data verification). Secondary data were collected from literature. The approach to use primary and secondary data in this study is focusing on selecting the data that is related to the study objective and the availability of resource for the study.

The Ichikawa method is the most accurate method used by this study to identify the causes and effect of the problems. Ichikawa method categorizes the different causes of a problem into 5 groups, called the 5M (Manpower, Money, Material, Machine and Method) (Owen, 2013). It breaks down a relatively large problem; identify areas to investigate further, where information is sometimes lacking; provide elements for developing suitable solutions to the problem; give a concise view of the cause and effect link. The goal itself remains unchanged and most importantly allows the identification of the most efficient solution.

However, the Ichikawa method resulted more than one solution. Another method is required in order to choose the most accurate solution. By concluding the strengths, weaknesses, opportunities and threats (SWOT) of each solution, the most accurate solution can be obtained and later discussed. The result of priority alternative solution was considered as the most efficient and effective way to solve major problems for Medical Record Unit in RSPP.

3.1. Location and Time

The research relating this study took place in the Medical Record Unit of the Pertamina Central Hospital in South Jakarta, Indonesia. The interval time of the research was during the 16 weeks internship period in the hospital. In addition, the interview section with the respondents took the interval time of 3 weeks.

3.2. Data Collection Techniques

The collected data in this research consists of the primary data and secondary data, which were obtained from expert interview and direct observation in Pertamina Hospital and literature.

1. The primary data is collected by:

a. Expert interview

The data collection method emphasizes the primary data through interviews in order to obtain more complete information. The Interview was performed using formulated interview guide. Furthermore, the responses were collected from the respondents with the ability to answer the research questions accurately. The interview conducted with Team Problem Solving Medical Records in the Pertamina Central Hospital in the form of recorded audio clip subjects of the interview were:

- Head of Patient Administration

- Medical Record Document Management Supervisor

- Assistant Medical Records Supervisor and staff regulatory documents

b. Direct Observation

This method was used to verify the problems that occurred in the Medical Record Unit of Pertamina Central Hospital in 2016.

2. Secondary Data

The secondary data was obtained from the published scientific literature, such as reference books, report studies and international journals. In addition, the references of regulation standards were collected from Ministry Health of Republic of Indonesia. The main literatures on this research are using the Medical Record Manual: A Guide for Developing Countries by WHO (2002). The literature reviews provided theoretical understanding in efficient and effective manner of medical record procedures. Afterwards, it was used for being discussed and guided the data analysis. Moreover, most regulations regarding to the medical records system

in Indonesia on this research are published by the Ministry Health of Republic of Indonesia. Below the inclusion and exclusion criteria of the scientific references:

Inclusion criteria	Exclusion Criteria
- English language - Indonesian language - Publication date 1989 – present - Credible source/publisher - Studies from any geographical location - Published journal	- Non English and Indonesian language - Published pre 1989 - Grey literature/ not published in a peer-reviewed journal. - Dissertations/ theses. -

Table 1. Inclusion and Exclusion of study references

4. Background Information

4.1. Medical Record

A hospital should mobilize the skills and efforts of widely divergent groups of professionals. Semi-professional and non-professional are required to provide highly qualified services to patients according to their own needs. The main objective of the hospital is to provide an adequate care and treatment to its patients. Its principal products are medical, surgical and nursing services for its patients. Its central concern is the life and health of the patients (Malhotra, 2009, p.1)

Hospitals are a vital part of society's infrastructure – as important as schools, the police department, or firefighting services. It is important to understand the macro information of hospitals, such as the number of hospitals available, how hospitals are classified, the typical cost per day and per stay, and the average length of stay (ALOS). Hospitals may be classified in different categories, such as by location (e.g., rural or community hospitals) or specialty (e.g., women's hospitals, orthopedic hospitals and surgical hospitals). Hospitals can also be classified by size, such as community-access hospitals (small, rural hospitals with fewer than 25 beds) or classified as governmental or non-governmental (Griffin, 2012, p. 13).

The Medical Record Department is often the first department to introduce the quality assurance of a hospital. As the Medical Record Unit has connections with most other departments within the facility, this unit is the best place to check the medical care and treatment of the patients. The Medical Record Department is a busy department and the work of medical record clerks is highly demanding. Although, staffs are not directly involved in patient care, the information recorded in the patient's medical record is an essential part of that care (WHO, 2002).

The professional medical records must contain all the relevant facts needed for patient care and other uses. The process of ensuring the adequacy, completeness and usefulness of the medical records requires a thorough knowledge of the information regarding the purpose, ownership, value, and responsibility uses of the medical records. The medical record is assembled after

the discharge of the patient to facilitate the logical flow of information regarding the patient's past and present illnesses, diagnosis, treatment and outcome. The information must be readily available for several purposes, for example; patent care, legal affairs, research, education, quality review, or correspondence (Malhotra, 2009, p.240).

Many countries have computerized systems for medical records procedures. The aim of many hospital authorities is for the development of an automated patient information service that will increase the efficient retrieval of information for patient care, statistic, research and teaching. The development of an automated patient information system, consist of five levels of automation (WHO, 2002).

It has been argued that the use of computerized system may improve effectiveness and efficiency of the Medical Record Unit. However, it only can be applied if the basic manual procedures are already in place and well organized. The first automation level is the automated medical record, which, depend on input from paper-based documents and consist mainly of administrative systems and clinical support systems such as laboratory results. The second is the computerized patient record (CPR), which is created by converting paper-based documents through document imaging system. At this level, the basic structure of the paper-based system is remain unchanged. The next three levels move from electronic medical records (EMR) to electronic patient record (EPR) and the last level is the electronic health record (EHR). The EHR is the ultimate goal in the development of health information systems. For hospitals considering moving to the first level, the Master Patient Index (MPI) should be the first procedure to be computerized (WHO, 2002).

4.2. Medical Record in Indonesia

In terms of structuring and processing or following the correct information system, currently the medical record system has not been implemented properly by hospitals in Indonesia. In 1972, by decree of the Minister of Health No. 034 / Birhup / 1972, there is a regulation for all hospitals to conduct medical records. To support the implementation of a good master plan, every hospital must:

1. have and to process the statistical data, in order to generate the up-to-date information data.
2. have the procedures for the implementation of medical records based on the provided provisions.

Between the period of 1972-1989 the implementation of medical records at Indonesian hospitals has not run as expected by the government regulation "Permenkes No. 269 / Menkes / Per / III / 2008". This regulation concerns the legal basis for all medical and paramedic personnel at the hospitals who are involved in the process of the implementation of the medical records.

Thus, the philosophy of the medical records must contain all information values that are accurate and can be accounted for: the administrative and legal information, the information on finance, research and education (Ministry of Health the Republic of Indonesia, 2006).

According to the Implementation Guidelines and Procedures of Medical Records Hospital in Indonesia, Revision II, Jakarta: Directorate General of Medical Services: Ministry of Health the Republic of Indonesia, 2006, the use of medical records can be seen based on several aspects:

a) **Administrative Aspect**

A medical records file has an administration value because it involves action by the medical and paramedical personnel to achieve the objectives of the service.

b) **Medical Aspect**

A medical records file has a medical value since the records are used as the basis for planning the treatment/care that should be given to patients. The file is also used as a mean of communication between the medical personnel and the patient in providing the health services.

c) **Legal Aspect**

A medical records file has a legal value due to the fact that it contains medical data. That must be stored and kept confidential. For that reason, health workers need to keep the patient's medical records for private medical use only or for the purpose of a research study

following the approval of the patient. A disclosure of medical data to the public without the legal consent of the patients has serious legal consequences.

d) Financial Aspect

A medical records file has a very important meaning in finance because it contains information that can be used as a basis of cost calculation for a patient during his/her treatment.

e) Educational Aspect

A medical record file has an educational value as it involves data/information about the chronological progress and the activities of medical services provided to the patients. That kind of information can be used as learning materials.

f) Research Aspect

A medical records file has a research value because it involves data/information that can be used for a research and the development of health study.
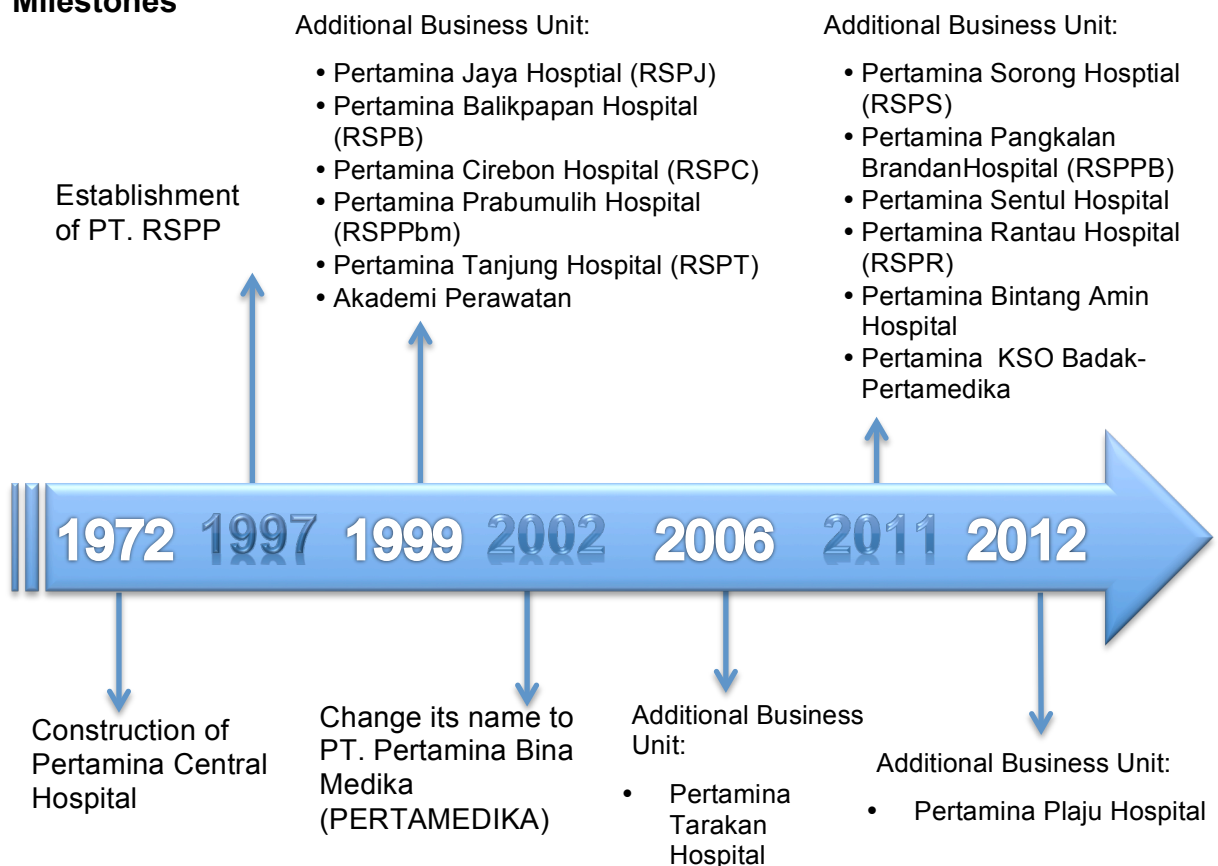
g) Documentation Aspect

A medical records file has a value of documentation because it concerns the memory resources that should be documented.

4.3. Pertamina Central Hospital

Since April 1998, Pertamina Central Hospital has separated from its main company (Pertamina) and has become governed by PT. PERTAMEDIKA. As a business unit, Pertamina Central Hospital is fully responsible for managing operational needs including payroll the Human Resources and Investment without any intervention from its parent company (Pertamina).

Milestones

Additional Business Unit:

- Pertamina Jaya Hosptial (RSPJ)
- Pertamina Balikpapan Hospital (RSPB)
- Pertamina Cirebon Hospital (RSPC)
- Pertamina Prabumulih Hospital (RSPPbm)
- Pertamina Tanjung Hospital (RSPT)
- Akademi Perawatan

Additional Business Unit:

- Pertamina Sorong Hosptial (RSPS)
- Pertamina Pangkalan BrandanHospital (RSPPB)
- Pertamina Sentul Hospital
- Pertamina Rantau Hospital (RSPR)
- Pertamina Bintang Amin Hospital
- Pertamina KSO Badak-Pertamedika

Establishment of PT. RSPP

1972 1997 1999 2002 2006 2011 2012

Construction of Pertamina Central Hospital

Change its name to PT. Pertamina Bina Medika (PERTAMEDIKA)

Additional Business Unit:

- Pertamina Tarakan Hospital

Additional Business Unit:

- Pertamina Plaju Hospital

Figure 1. Milestones of Pertamina Central Hospital

The purpose of the changing status is to make Pertamina Central Hospital into a business-oriented hospital without ignoring its social function. This status transformation has change the system to profit-oriented enterprises as well as to pay more attention of competition and being an advance in service quality. In order

to develop the new system in Pertamina Central Hospital, an appropriate degree of human resource development is required. This includes the changing of way of thinking, actions and attitude to be qualified to compete in the globalization era.

Vision   : Be the best hospital with sophisticated medical services concept

Mission   :

- Providing comprehensive specialist healthcare services
- Being a comprehensive hospital providing specialist health services.
- Building loyalty through customer satisfaction with professional human resource and excellent work culture.
- Increasing revenue growth with effective and efficient cost control.

Motto   : We Care and We Cure.

RSPP was built with these following considerations:

1. The hospital was built primarily intended as a reference for clinics or small local hospital where Pertamina Company operates. Therefore, Pertamina hospital offers health facilities to accommodate their employees and their families.
2. As the condition of facility services of hospital in Indonesia, especially in Jakarta, were not in an adequate level in comparison to the facilities in advance countries.
3. To accommodate the foreign diplomatic corps, for who does their treatment abroad.
4. Additionally, the hospital services can be used by the locals, especially in Jakarta and surrounding areas concerning of its strategic location in the middle of residential area.

4.3.1. Facilities and services of RSPP

RSPP delivers the optimal health services for all patients, which is being supported by dedicated and qualified experts in their fields. The types of services provided in RSPP will be describe as follow:

4.3.1.1. Outpatient and inpatient services

Outpatient and inpatient service facilities have improved over the past few years in regards to composition and patient's convenience. Patient convenience includes renovated buildings and the addition of medical equipment facilities.

Specialist outpatients' services, consists of:

1. Surgery Polyclinic: General, Digestive, Bones, Plastic, Oncology, Tumor, Thorax, Neurosurgery, Children, Urology

2. Internal Disease Polyclinic: Tropik, Endocrine, Gastro Enterologi, rheumatic, Hematology

3. Children's Health Clinic

4. Clinic of Obstetrics and Gynecology: Obstetrics, Gynecology, Oncology.

5. Eye Clinic

6. ENT Clinic

7. Polyclinic of Nerve

8. Polyclinic of Heart

9. Dermatology Clinic

10. Dental Clinic, Oral Surgery, Dental Children

11. Mental Health Clinic, Psychology

12. Lung Clinic

13. Polyclinic of Nutrition Consultation

14. Polyclinic of Acupuncture

15. Polyclinic of Andrology

16. Occupational Health Clinic

17. Private Clinic (afternoon)

18. Polyclinic of Medical Check up (MCU)

Inpatient services in RSPP are intended for patients' referral, those sent from the emergency unit, outpatient clinic as well as patient referrals from other hospital which carry a referral or references from a concerned doctor or hospital.

Patients who has an access to use medical facilities of RSPP as a referral hospital is falling into seven categories:

a. Pertamina employee, contractors and sub-contractors Pertamina with legitimate family;

b. Members of sub diplomatic and legitimate family;

c. Employee of subsidiary companies of Pertamina;

d. Patients referred to RSPP from other hospital;

e. Public (non-Pertamina);

f. Pensioner of Pertamina;

g. Employee and legitimate family who work in Pertamedika environments.

Inpatient facilities at RSPP consist of:

	Adult treatment rooms	**Child treatment rooms**
General treatment rooms	• President Suite • VVIP • VIP • Class 1A • 1B class • Class II and class III	• VIP A1 • A2 VIP • Class 1A • Class II • Class III
Special treatment rooms	• ICU A • ICU B (burns) • A special class of burns • Surgery rooms • VIP Midwifery • Stroke unit	• Incubator babies' room • Intensive Care Unit (ICU)

Table 2. Inpatient facilities at RSPP

Source: The Medical Record Unit RSPP in 2016

4.3.1.2. Support and featured services

Hospital support services defined as hospital departments or cost centers that do not provide direct medical test for patients, but in general support the hospital's mission (Malhotra, 2009, p.216). These services do not typically generate patient revenue and are not under the professional direction of a physician. There are three types of support services in hospital: patient support service department, facilities support service departments, and administrative support service departments (Snook, 2004, p.121). The patient support services may have direct patient contact. The facilities support services include the traditional plant operation services such as environment services, maintenance, the physical plant, and clinical (biomedical) engineering department. The administrative support services are nonpatient care departments that directly support the administrative mission of the hospital and include the materials management, human resources, volunteers, and telecommunications department. Below are the support services provided by RSPP:

1. 24 Hours Clinical Laboratory
2. Anatomical Pathology Laboratory
3. Cytology Laboratory
4. 24 Hours Pharmacies
5. Rontgen
6. CT Scan
7. Ultrasound, EEG, EKG, endoscopy, EMG
8. Physiotherapy
9. Laparoscopy
10. Bronchoscopy
11. Spirometry
12. Treadmill
13. V O2 Max
14. Body Plethysmography
15. Audiometry
16. Medical Rehabilitation

RSPP has featured services such as the Installations of Burns Care, Magnetic Resonance Imaging (MRI), and a Gamma Camera. Even though RSPP is a private hospital, they serve patients from Jakarta local residents, who are considered as poor families.

4.3.2. Performance of Pertamina Central Hospital

Several indicators can be used to assess the services performance of a hospital. However this study will focus on examining several of the respective indicators such as Bed Occupancy Rate (BOR), Average Length of Stay (ALOS), Turn Over Interval (TOI), and Bed Turn Over (BTO) (Goel, S, et al, 2014, p. 358). The following are the performance of RSPP based on the Pertamina Central Hospital Medical Record Unit in 2016.

Performance of Pertamina Central Hospital 2014 – 2016

Indicator	2014	2015	2016
BOR	61,60	58,33	56,02
ALOS	5,4	5,2	5,1
TOI	3,26	3,74	4,04
BTO	39,34	37,20	36,49

Table 3. Performance of Pertamina Central Hospital 2014 – 2016

Source: The Admission Unit of RSPP in 2016

1. BOR (Bed Occupancy Rate)

BOR standard is between 60 – 85 %.

$$BOR = \frac{\text{Days of treatment x 100\%}}{\text{Number of beds x Days in time}}$$

BOR is used to determine how the utilization rate of the beds in the hospital's inpatient unit. Low percentage of BOR indicates a lack of utilization of the facilities provided by a hospital to its patients. As the numbers BOR reaches 85%, then it illustrates the use of the bed in an appropriate level. BOR in the inpatient unit of RSPP from 2014 to 2016 tended to decrease.

2. ALOS (Average length of stay)

ALOS standard is between 6 -9 days.

$$ALOS = \frac{\text{Days of stay}}{\text{Number of return patient (alive + dead)}}$$

ALOS in RSPP from 2014 to 2016 are relatively the same, which is about 5 days and tended to decrease. ALOS is the average length of a patient admitted to the hospital. The measurement used in ALOS is days. The use of ALOS has many benefits, such as:

a. To measure the quality of services provided by the hospital when it is applied diagnostic tracer (assign certain cases that will change).
b. To measure the efficiency of hospital services (Goel, S, et al, 2014, p. 358).

3. TOI (Turn Over Interval)

TOI standard is between 1- 3 days.

$$TOI = \frac{(\text{Number of beds x days}) - \text{days of treatment}}{\text{Number of return patient (alive or dead) within one year}}$$

TOI is the average days when the beds are not occupied until filled by the next patient. In 2014 TOI on RSPP is 3,26 days, then increase to 3,74 (2015) and 4,04 (2016). TOI in the RSPP tend to far from standard ideal of TOI.

4. BTO (Bed Turn Over)

BTO standard is between 40-50 times.

$$BTO = \frac{\text{number of return patient (alive/dead)}}{\text{Number of beds}}$$

BTO is frequency of the use of bed in a measure of time. Usually the measure used is 1 year. This indicator gives a view of the efficiency of the use of bed. BTO in the RSPP by 2014 is 39.34 times. However the number decreased in 2015 (37,24) and in 2016 (36,49).

5. Findings

5.1. Analysis of documents flow in Medical Record Unit

5.1.1. Activities in the Medical Record Unit

The activities of the Medical Record Unit in RSPP has undertaken documentation of services with their medical record documents that have been organized and managed with reference to the implementation guidelines for the medical records of the Ministry of Health (MOH, 2006).

The medical records form appears as the blank paper that will be filled by doctors who treat the patients in accordance with the action and analysis of physicians during the patient's treatment. Therefore, Pertamina Central Hospital still implemented the computerized Master Patient Index (MPI) as the computerization of patient-related medical record data.

The information in a computerized MPI is the same as that recorded in manual one. As for a manual system, the objective of a computerized MPI is patient identification. The main function is the entry, storage and retrieval of the patient's name and medical record number (MRN) (WHO, 2002).

The Medical Record Unit in RSPP has been using computerized MPI, where the patient data from the beginning of registration until the financial section will be integrated with other units to facilitate the orderly administration and payment. The computerized MPI system also allows officers to seek medical record patient data that does not bring the medical card and medical records that would track the whereabouts of the last document is located.

As a manual system, the search program in computerized MPI should enable the operator to locate a particular patient to determine if that patient has been in the hospital previously and has a medical record number (WHO, 2002).

Figure 2. The Medical Record Unit of RSPP

The location of the Medical Record Unit has been replaced for three times since RSPP established in 1972. The Medical records Unit is a department that handles administrative duty regarding medical records documents of patients either outpatient, inpatient, emergency unit, and Medical Check Up (MCU) and all of health care activities in RSPP. Medical Record Unit at RSPP is led by the Chief of Patient Administration, who is in charge of three divisions, namely, admission, medical record document management, and administration and verification unit. Moreover, a Chief of Patient Administration is directly responsible to the Deputy Medical Director.

5.1.1.1. Structure of Medical Record Unit

Medical records services are used to support administration order to improve the quality services of a hospital. Due of the vital nature of the work of the department, it is important to obtain support from the hospital administration and medical staff. The hospital administration, medical and nursing staff, and allied health professionals should also be made aware of the work of the Medical Record

Department and problem that may arise in relation to the recording of patient care data. The Medical Record Officer (MRO) is responsible for the development and maintenance of policies and procedures relating to the medical record services of the hospital (WHO, 2002). Chief of Patient Administration supervises three parts, namely:

1. Admission

   Admission at RSPP is a gate to careful and prompt hospital services with the international class.

2. Medical Record Document Management

   The management of medical records in RSPP is an activity that provides information and medical record service by data processing, analyzing and making reports for each patient who uses the hospital service.

3. Administration and Verification

   Administration and verification of RSPP provide the transaction records and their role is to fix data errors, which billed to the patients' guarantor or insurance company. Corrections and clarifications to the transaction data are done before or after the billing.

5.1.1.2. Workforce in Medical Record Unit

In total, employee of medical records unit in RSPP accounted 24 persons until December 2016, plus three associate employees for microfilm. In performing the duties, the Supervisor of Medical Record Document Management is assisted by four superintendents, namely:

1. Operational Medical Record:
   - four staffs of medical record document retrieval
   - one staff of patient care agreement
   - four medical record document distribution officers.

2. Medical Records document:
   - one coding and indexing regulatory staff
   - one staff of regulatory document home care
   - four staffs for typing resumes medical

3. Statistics and Reporting:	• one person in charge of internal and external reports • one person responsible for statistic Pertamina report
4. MedicalRecord Administration:	• one staff of visum part / insurance • one staff of assembling parts / assembly of medical records.

5.1.1.3. Documents flow

➢ Outpatient

a. New patients

1. Each of the new patients to be treated should take a queue number, which has been provided.

2. New Patients fill in personal data forms that have been provided completely.

3. The completed form is submitted to the registration booth for new patients.

4. The registration officer inputs the data into the computer to print the medical record number and the ticket.

5. The new patients who have paid will be given a receipt and a medical card (embossing card). Patients are allowed to wait in the designated clinic.

6. The medical records officer creates a document of a new patient's medical record and writes the medical record numbers, the patient's name, age, sex, and marks according to medical records of outpatient visits. The documents of medical records are then written in an expedition book and distributed by the medical records officer to the intended polyclinic.

b. Older patients

1. Every patient must take a queue number.

2. Older patients submit the medical card (embossing card) to the registration officer for new patients, if the patient is insured references should be included.

3. The registration clerk cashier inputs patients' personal data into the computer and print the ticket. Insured patients must receive approval verification beforehand.

4. After the patients pay at the cashier, they are allowed to wait in the intended clinic.

5. The medical records officer looks for a clinic-card in storage rack to be then recorded on the expedition books and sent to the intended clinic.

6. Patients receive care in the clinic. Then, there are the possibilities of being discharged, treated, or refer to another hospital.

➢ Inpatients

1. Inpatients come from A&E (Accident and Emergency), polyclinics, and referrals from others hospitals / clinics.

2. Inpatient registration officer receive a referral from A&E or clinic, guarantee letter and medical records documents of patients who are to be treated.

3. The registration officer provides information about the rules, facilities and payments of inpatients to the family.

4. The registration officer inputs hospitalization registration data.

5. The registration officer sets the room in accordance with the right of guarantor.

6. The registration officer passes the administration to care floor. Things that need to be done by patients (the down payment, guarantee letter, participation letter, etc.), within 24 hours for non-Pertamina deposit patients and within 48 hours to deposit insurance patient.

7. The registration officer contacts the outpatient unit (after hours) to inform them that patients are ready to take escorted by a nurse.

5.1.2. Storage and numbering-system of Medical Record (Filing System)

The storage system of medical records file in RSPP uses a centralized system, where files of outpatient and inpatient stored in one place. The numbering system of medical record used in RSPP is Unit Numbering System which gives one number for one patient either outpatient or inpatient. The medical record number given at the first time a patient is treated by RSPP and the numbers obtained are used forever, so that a patient's medical records will be stored under one number.

Figure 3. Storage room of patient's medical record documents in RSPP

The naming system on a patient's medical records is done by writing the patient's name and then completed by the father's name / family / clan, while acknowledging that patients are likely to mention their own names more quickly than their parents' names. Father's name / family / clan is used to help distinguishing the medical records of patients with the same name.

Based on MOH RI (2006), there are two ways to save a file in conducting the medical records, they are:

1. Centralized

   The centralization means patients' medical records are stored in a unified storage, either clinic visit records or the patients' treatment records. The use of a centralized system has strengths and weaknesses.

   Advantages:

   a. Reduce duplication in maintenance and the storage of medical record file.

   b. Reduce the amount of charge used for equipment and shortcomings.

   c. Ease the process of standardizing procedures and regulations regarding the activities of medical records.

   d. Make storage officer more efficient.

   e. Easy to implement the system unit record.

   Disadvantages:

   a. Busier officers due to handling outpatient and inpatient units..

   b. The admissions (unit) should be on duty for 24 hours.

2. Decentralization

   Decentralized systems have a separation between the medical records of the clinic and the medical records of the patients treated. Medical records file of outpatient and inpatient kept separated in the storage area.

   Advantages:

   a. Time efficiency in way that patients get faster service.

   b. Lighter workload on officers.

   Disadvantages:

   a. Duplication occurs in the process of medical records.

   b. Higher cost of room and equipment.

   Theoretically, centralization is way better than decentralization. But in practice, it depends on the circumstances of each hospital. Things that may affect the situation and conditions include:

   1) Due to the lack of skilled personnel, especially those who deal with the medical records management.

   2) The low capacity of hospital fund, especially hospitals that run by local governments.

A centralized system is the most appropriate to select for a patient given the services it provides. Medical records storage systems are organized based on the numeric system commonly used in practice, namely:

a) Straight Numeric Filing System

Straight Numeric Filing System is the medical records storage that organized the documents in a row with the order number (Kuehn, 1997). The following medical records are stored sequentially in a single rack, namely:

465 023, 465 024, 465 025.

b) Middle Digit Filing System

The storage of medical records are sorted by paired numbers. Additionally, this system used final paired numbers. In this case the numbers located in the middle become the first number (Kuehn, 1997). Paired numbers located far left into the second number and couples rightmost digits into the third number.

58-78-96	99-78-96
58-78-97	99-78-97
58-78-98	99-78-98
58-78-99	99-78-99
59-78-00	00-79-00

c) Terminal Digit Filing System

Storage with a final number, commonly called as (Terminal Digit Filing System). It uses six digits of numbers, which are grouped into three groups, each consisting of 2 numbers. The first two paired numbers located far right, the second number of the paired numbers is located in the middle and the third number is the paired numbers located far left (Kuehn, 1997).

50	50	50
(tertiary digits)	(secondary digits)	(primary digits)

In the storage system with a final digit (Terminal Digit Filing System) there are 100 groups of the first number (primary section) that is 00 to 99. The numbering system uses more points to select because it is commonly used more easily.

46-52-02	98-05-26	98-99-30
47-52-02	99-05-26	99-99-30
48-52-02	00-06-26	00-00-31
49-52-02	01-06-26	01-00-31
50-52-02	02-06-26	02-00-31

5.1.2.1. Physical Facilities Storage Space

The hospital administration must provide security and sufficient storage space for medical records, and an adequate working area for medical record staff. The Medical Record Unit staff must safeguard medical records from tampering, loss and unauthorized use. They are responsible for seeing that the patient's right to privacy and the confidentiality of the information stored within the medical record are maintained at all times (WHO, 2002). The good storage tools, good lighting, temperature regulation, and maintenance room are required. Moreover, the officer's safety is an important concern in the medical records storage room. It can help nurture and encourage the morale and improve officer's productivity who work at the storage room.

Medical records storage tools commonly used;

1. Open shelves unit file

    Open shelves are more advisable to use, for these following reasons:

    a. The price is cheaper.

    b. Officers can take and store medical records faster.

    c. It saves a lot of space to accommodate more medical records.

2. The five - drawer file cabinet

3. Roll O'Pack (consist of static and dynamic file rack)

The distance between the two racks to traffic, recommended by 90 cm. Space in front of vacancies should be 90 cm if placed facing each other should be made available vacant space for at least 150 cm to allow the open drawers. Five cupboard drawers should look more presentable and medical records should be protected from dust and dirt from the outside. However, the maintenance of good hygiene, will maintain medical records kept tidy in terms of the use of the shelves. Safety factors must take precedence in the medical record storage (MOH RI, 2006). Following the condition of work and storage procedures by the Ministry of Health:

1. Safety regulations must be written clearly in every part of the storage. It should be printed. An officer should not fall down or get injured while working on the storage shelves mentioned above.

2. There shall be anti-slip stairs.

3. The space motion for a working width of desk had to separate the storage shelves.

4. The lighting should be good avoiding eye fatigue officer.

5. There must be available storage racks that can be easily removed or shelves on wheels.

6. Room temperature settings, humidity, dust prevention and fire prevention.

Figure 4. Storage room of inactive patient's medical record documents in RSPP

5.1.2.2. Returning of Medical Record Document

Return interval of medical record document defined as the interval time of patient's medical records that have been borrowed for the treatment process of outpatient, inpatient, emergency care, or Medical Check Up. Medical records documents are not justified to keep except in Medical Records Unit. The medical records officers do the expedition of medical record documents that have been returned, checking out the complete contents of the medical records and store it back in storage racks.

According to the book of Minimum Service Standards (SPM) Hospital, the Directorate General of Medical Services, Ministry of Health in Jakarta in 2008

stated that the deadline for the return of the medical records of outpatients to medical records is 24 hours, and the medical records of hospitalization is 48 hours after the patient discharged with the standard completeness 100%.

5.2. Description major problems found in the Medical Record Unit

This chapter will focus on the problem pertaining to the Medical Record Unit, particularly in the section that carries out the monitoring of medical records document of discharged patients. Monitoring aims to improve the quality of health services that are in accordance with the mission and vision of the hospital. The main problem is due to the delay submission of the documents to the Medical Records Unit after discharge.

The problems found in the Medical Record Unit of Pertamina Central Hospital were confirmed by the head of the Medical Record Unit, who is responsible for the management of discharged documents and surveys of the Medical Record Unit of RSPP. According to the survey that has been conducted by the Medical Record Unit of RSPP, there are around 68% of medical records that have not been return to medical records room within 48 hours. **The medical records documents of discharged patients were unsuccessfully returned within its normal period of 48 hours**. This is not in accordance with the SPM-MOH about return time interval of inpatient medical record, which is 48 hours after the patient's discharge with the standard 100%. The study indicates several reasons describe below:

    a. A large number of patients are discharged everyday. This can cause the high workload of medical records clerk.

    b. High demand of actual patient resume either from insurance company or patient guarantor.

    c. The officers are not proactive in checking the return of the discharged patient medical records document as regulated in SOP (Standard Operating Procedure).

    d. The doctor did not immediately sign the medical record documents that was submitted.

e. The time period of resuming the discharge patient document, which already signed by the doctor, is not defined.

f. Lack of analysis process of medical resume that has been signed by doctor (proof of authenticity) due to less understanding about the importance of an analysis discharged patient's medical records document.

g. There is no evaluation of medical record documents between the numbers of discharged patients and the medical records documents returned.

h. Lack of cooperation between the floor attendants with medical records officer by process of returning the medical records document of discharged patients.

The problems mentioned above may directly or indirectly affect the efficiency in handling the patient documents. It will cause the decline level of patient's satisfaction, which could also mean the lower quality of the hospital services.

5.3. Determination of root problems

To determinate the roots problems, this research is using the 5M of Ichikawa method and it will be conclude below:

Analysis of Causes Major Problem After Ichikawa Method (Fish Bone)

Money

Funds allocated for that medical records are still limited. The medical record is not a profitable unit

Material

- Room medical records are no longer sufficient

- The layout of the room typing medical resumes apart from the medical record room

Method

- The medical records documents are still manual typed

- SOP medical records have not been fully executed officers medical records

Delay of discharged patients' medical records document to the Medical Record Unit (over 48 hours).

Man

- The records officer insufficiently proactive by monitoring the return of the medical records of hospitalized patients.

- Lack of amount of clerk typist medical resumes

- The clerk did not have the educational background of medical records

-Lack of IT skill personnel

Machine

- Inadequate support facilities such as computers, shelving, folders, tracer and other purposes

- Lack of printer for printing medical resumes
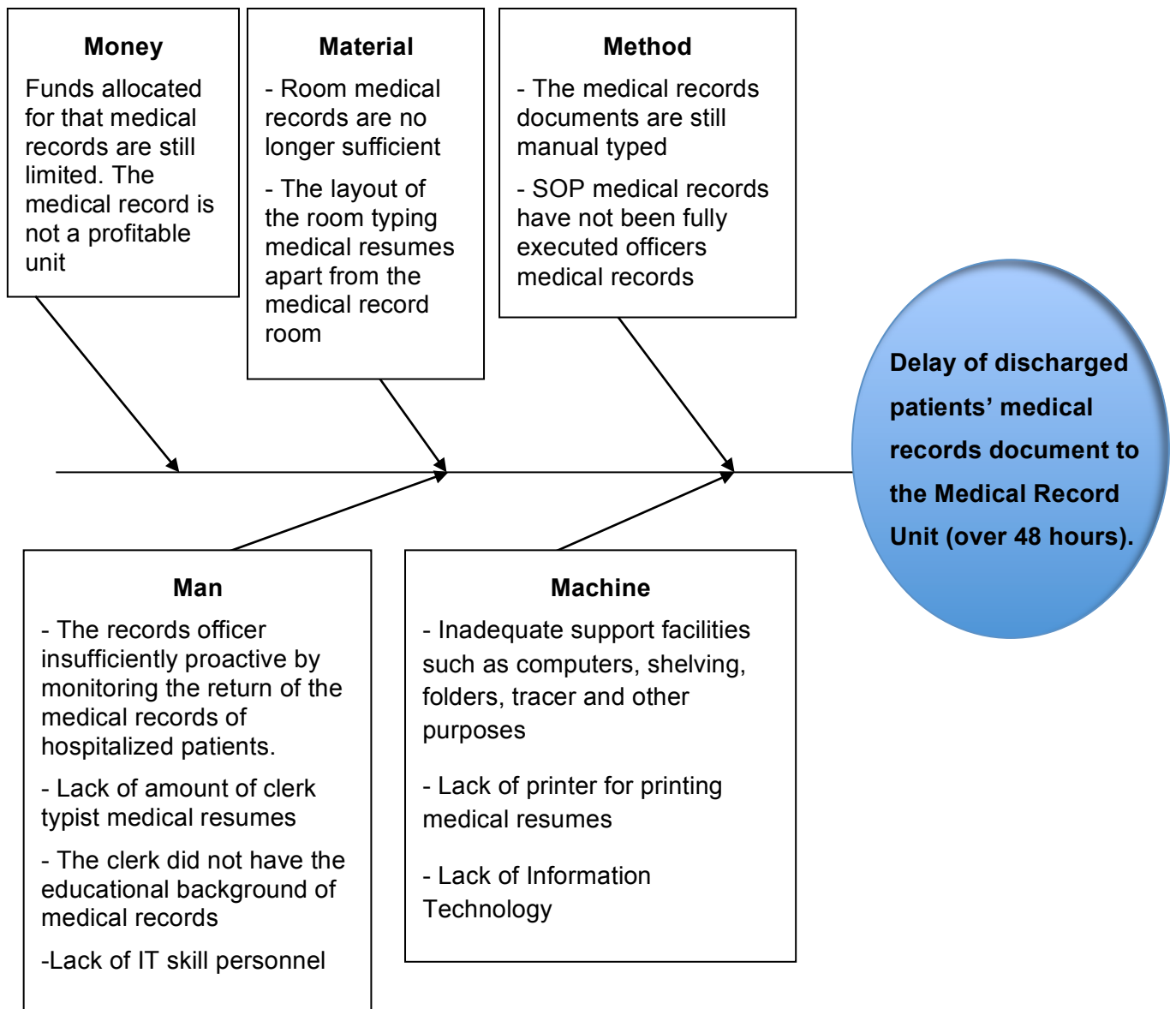
- Lack of Information Technology

Figure 5. Causes major problem after Ichikawa (Fish Bone) method

The following description of each factors explained, which can cause **delay of discharged patients' medical records document to the Medical Record Unit (over 48 hours)** by using 5M methods: Man, Money, Materials, Machine, and Method.

1. Man (Human Resources)

   Mismanagement by the medical records officer can lead to an overload of inpatient medical records that have not been recorded, therefore the numbers of inpatient medical records that have not been returned are overloaded. In addition, the numbers of resume typist are low and the lack of educational background concerning medical record system still occurs for many resume typist and the medical records officers.

2. Money (Budget / Funds)

   Funds allocated for the organization of medical records are still lacking, due to personnel choices, which stated, that medical records is not a directly profitable department.

3. Material (Means)

   The equipment needed to carry out management tasks of medical records is inadequate, such as room that was already beyond capacity and the location of the medical record officers is apart from the medical record storage room.

4. Machine (Infrastructure)

   The inadequate inventories infrastructures are still lacking. It includes a number of computers and printer to print the results of a medical resume discharged patient.

5. Method (Method / Way)

   The statement below explains the method that causes the many problems:

   a. Paper-based document and manual input data. Medical records documents of discharged patients are still type manually, therefore when they choose to move to another clinic, records are not accurate.

   b. Medical records officers may also error by not being proactive in monitoring the return of medical records of discharged patients. Medical record documents returned from the treatment room would not match with the number of medical records officer. Some medical records documents are still stuck in treatment room.

5.4. Alternative problem solution

This issue effects the quality of service and leads to slow service to patients as well as hinders medical records officers. This research tries to offer alternative solutions that could be implemented by Pertamina Central Hospital. Below are the solutions obtained by using the Ichikawa method and by field observations:

1. The policies regarding rewards and punishments to the units or personnel involved in the flow of patients' medical record. Physician, nurses, floor attendant and monitoring officers in discharge station are counted to comply the policies. By using this policy, it is expected that relevant units or personnel can recognize the importance of the interval time of the return patient medical record and reduce the errors.

2. SOP is socialized regularly to the units involved including nurses and physicians. This concerns the returning of documents of discharged patients within 48 hours.

3. The use of Electronic medical Record

4. Create a daily report analysis of discharged patients and time interval of returning documents. Daily reports are made to simplify the process of monitoring patient documents more easily. It observes how many documents are returned on time of each floor and adjusted by the number of hospitalized patients go home everyday.

Through the SWOT method, the priority alternative solution is obtained by **making daily report of the patient's documents.** The following describes the strength, weakness, opportunity and threats, which can appear during implementation of the priority of alternative problem (Lind, 2015, p.115).

1. Strength

Implementations of this solution have the power as follows:

– Officers in Medical Record Unit, physicians and the nurses in station stated that their activities were more trackable by creating daily report of the patient's documents, so that the existence of the document better monitored.

– The method is easy to coordinated between medical records officers with the clerk in the treatment room.

– Not costly

– The problem can be solved by affecting the facilities, nfrastructure, and human resources without requiring a huge cost compare to implement the technology of EMR.

2. Weakness

Implementation of priority solution is indeed to achieve the best intervention, but in practice, it still has shortcomings as follows:

– Lack of awareness by the medical records clerks to enter the patient's medical records data into the form and the computer.

– Lack of coordination between the officers in Medical Record Unit document by monitoring the discharge patients.

3. Opportunity

Implementation of these solutions can generate positive possibilities to improve existing systems:

– Paving the way towards the organization of medical records according to standards set by Ministry Of Health of Republic of Indonesia.

– Improved quality of care.

– Reduce the number of late return of patients medical records will improve the officer of Medical Record Unit performance as well as improving the quality of services provided to each patient visit.

4. Threats

Implementation of these solutions could cause possible obstacle and distraction, such as:

– Negative responses from the medical records officers and units involved in the implementation of this policy.

6. Discussion

With an increase in number of patients, the pressure on doctors and hospital staff has increased severely. At first, when a patient used to visit hospitals, their information was stored on paper. Pertamina Central Hospital as well as most hospitals in Indonesia recorded every test, medication, and hospital visit for the patients manually on paper. Each department of hospital has its own set of records. The paper-based system had raised many concerns with the main one being security of the data; followed by cost and time. Moreover, patient records in the hospital were kept in the form of written documents.

In my opinion, the medical record is the heart of clinical care and it is poorly maintained in Indonesia clinics today. Most often, a patient's record is just a folder with patient's details and photograph on the front cover and sheet of data recording previous visits inside. Although, the alternative solution known as **making daily report of the patient's documents** is assured as the most accurate solution for the efficiency in handling inpatient medical record in RSPP, the other solution for the long-term perspective should be implemented.

One of the solution known as EMR could be the best solution in the long-term perspective. The use of information technology in Healthcare brought a revolution in capturing data of patient. EMR most focuses on improvements in efficiency, patient experience, and care (Mane & Kulkarni, 2012). With paper-based medical records keeping, communication between care providers is extremely difficult, especially in developing countries. In this case at Pertamina Central Hospital, if a paper-filed medical record needed to seen by a different care provider or someone at different location, that paper file would have to be hand-delivered to this new location. This method is time-consuming and inefficient. All of these efficiency problems that were previously discussed can be addressed by the implementation of EMR. Since electronic medical records can be sent from one location to another almost instantaneously (Webster et al, 2008).

Electronic medical records systems have numerous benefits, such as improvement in the quality of care, medical error prevention and reduction of unnecessary care cost (HIR, 2013). They would improve the legibility of clinical notes and provide decision support for drug ordering, including allergy warnings

and drug incompatibilities. Moreover, they help support program monitoring, including reporting outcomes, budgets, and supplies (Hillestad, et al, 2005). No matter what electronic medical records system is implemented, it is a sure thing that the overall quality of healthcare in the area will increase. EMR systems will eliminate problems; eliminate errors, save time, and save money in the long run.

Despite the many benefits of having EMR, there are still several downsides, especially when systems are first implemented. EMR can be quite difficult to establish and maintain in developing countries. Many factors, including the population demographics, the location of the care center, and the availability of resources, all come into prominent role. Furthermore, EMR system can expensive to implement. Some physicians also continue to resist the new technology, as they prefer the standard method of record keeping (Tomasi et al, 2004). The limited adoption of EMR system in developing countries is due to limited or lack of understanding of the problems and challenges surrounding the delivery of healthcare in poor settings (Douglas, 2009).

According to the World Health Organization (2012:28), developing countries are handicapped by lack or resources, which make the implementation of electronic systems very difficult. Several researchers elaborate on the challenges faced by developing countries and these are summarized in figure 6:
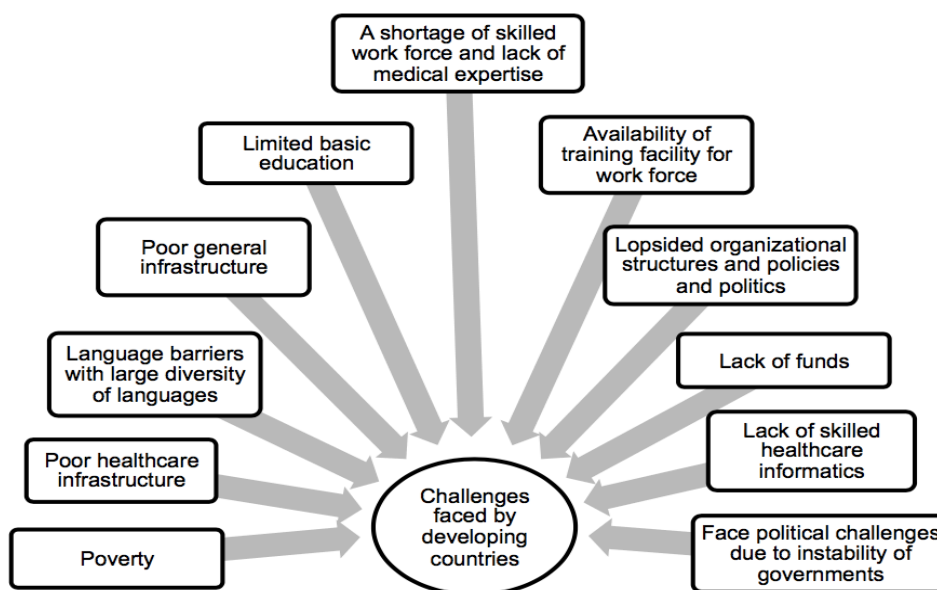
Figure 6. Summary of challenges faced by developing countries

In deciding what EMR systems to develop and deploy in developing countries, promising ideas are not enough: they need to be validated in the field. The introduction of IT systems to remote sites with no communication should provide good opportunities to evaluate the impact of data management tools (PHCSG, 2005). Lack of infrastructure and trained, experienced staff are considered important barriers to scaling up the treatment of diseases.

Since there are very low or slow returns on EMR systems in developing countries, these systems do not yet show up on the thrust areas of entrepreneurs in developing countries. Language is another notable factor that influences the adoption of EMR systems primarily because of the language diversity that may exist in many developing countries (IEEE, 2008).

7. Conclusion and Outlook

7.1. Conclusion

The problem to focus on is delay of discharged patients in the Medical Record Unit of RSPP. This has huge effects to the quality service to patients and hinders the work of medical records officers. Below shown the leading factors of these issues:

1. Medical records document of discharge patients was typed manually.
2. The medical records officer insufficiently in monitoring the return of medical records of discharged patients after being hospitalized. Many of medical record documents returned from the treatment room do not match the number of monitoring of medical records officer. Some medical records documents of hospitalized patients are still stuck in the treatment room, resulting delays in medical records-keeping on the shelf.

The factors of the problems mentioned above are the difficulties in the operational section when patients discharge from the hospital. Moreover, when the medical records documents are still in the treatment room, it could impacts; delays in the process of coding, delay in the process of assembling, increasing the

workload and time for operational personnel, delay in making the monitoring report. The mismatch between the SOP with the facts that occurred will result in the value of hospital accreditation concerned.

7.2. Outlook

The most effective alternative problem solution in RSPP is to **making daily report of the patient's documents.** Another solutions can be implemented in the future and later discuss. A sustainable development of human resources holds training sessions, seminars and directed and guided communication so that the problems occur can be solved easily together. In this forums there will be interaction, exchange of information and discussion of problems to accelerate self-development. Things to notice by the leader are: to motivate the officers, effective vertical and horizontal communication, fair system of remuneration, a discussion forum to evaluate the implementation of medical records during an ongoing basis.

It is necessary to build a conducive working atmosphere so that medical records officers will feel committed to a given work. Placing the atmosphere in a balance proportion between rights and obligations is a key working relationships between supervisors and officers as well as relationships with colleagues.

As mentioned above, in order to improve the situation of the Medical Record Unit at RSPP, the most accurate solution is to **make daily report of the patient's documents.** Therefore, the officers in Medical Record Unit, physicians and the nurses in station can track the existence of the document and can be better monitored. This solution can be implemented by enhancing facilities, infrastructures and human resources without requiring a huge cost compare to implement the new technology of EMR. Although, the EMR system is important in healthcare delivery, there are still many challenges regarding to the implementation as discussed above. However, the challenges can be mitigated and thus increasing the implementation of EMR systems.

Developing countries such as Indonesia, have very limited adoption of EMR systems because of challenges associated with limited resources. For the future, it is better to understand the role and importance of EMR in improving health care

and inform government actions that could maximize the benefits of EMR. There must be a serious effort to be taken into consideration for educating the medical community in Indonesia in respect to benefits of the electronic medical record system. In summary, the selected alternative solution is the best method to improving the activities of medical records at Pertamina Central Hospital in Jakarta, Indonesia.

List of References

Douglas G.P., (2009). Engineering and EMR System in a Developing World – A Necessity in the Mother of Inventions. Dissertation, (PhD.). University of Pittsburgh.

Goel, S., Gupta, A. & Singh, A., (2014). Hospital Administration: A Problem-Solving Approach. New Delhi: Reed Elsevier Indian Private Limited.

Griffin D. J., (2012). Hospitals: What They Are and How They Work; Fourth edition. San Marcos, Texas. Jones & Bartlett Learning, LLC.

Healthcare Informatics Research, HIR. (2013). Cost-Benefitt Analysis of Electronic Medical Record System at a Tertiary Care Hospital. The Korean Society of Medical Informatics.

Hillestad, R., et al., (2005). Can Electronic Medical Record Systems Transform Health Care?: Potential Health Benefits, Savings, And Costs. Economics of Health Information Technology, vol. 24, no. 5, pp. 1103-1117.

Institute of Electrical and Electronics Engineers, IEEE. (2008). Electronic Medical Records: A Review Comparing the Challenges in Developed and Developing Countries. Proceedings of the 41st Hawaii International Conference on System Sciences.

Kuehn, L., (1997). Health Information Management: Medical Records Process in Group practices. Colorado. Center for research in ambulatory health care administration.

Lind, P., (2015). Monitoring Business Performance: Models, Methods and Tools. New York. Routledge Taylor and Francis Group.

Malhotra, A., (2009). Hospital Management: An Evaluation. New Delhi: Global India Publications Pvt Ltd.

Mane, R., & Kulkarni, R., (2012). A Review: Electronic Medical Records (EMR) System for Clinical Data Storage at health centers. India: International Journal Computer Technology and Applications.

Owen, M., (1989). Statistical Process Control and Continuous Improvement. Berlin. Springer-Verlag.

Primary Healthcare Specialist Group, PHCSG. (2005). Implementing electronic medical record systems in developing countries. Informatics in Primary Care. British Computer Society.

Ramani, K., (2013). Hospital Managemnet: Text and Cases. Pearson Education in South Asia. Dorling Kindersley (India) Pvt. Ltd.

Sikhondze, N., & Erasmus, L., (2016). Electronic medical records: a developing and developed country analysis. International association for management of technology 2016 conference proceedings.

Snook, D., (2004). Hospitals: What They Are and How They Work. Sudbury, Massachusetts: Jones and Bartlett Publishers.

Tomasi, E., Facchini, L. A., & Maia, M. S., (2004). Health information technology in primary health care in developing countries: a literature review, Bulletin of the World Health Organization, 82 (11), 867-874.

Webster, J., Baran, J., Kalogriopoulos, N., Nimunkar, A., & (2008). Electronic Medical Record Systems for Developing Countries: Review. USA.

World Health Organization, WHO. (2002). Medical Records Manual; A guide for developing countries. Regional Office for the Western Pacific.

World Health Organization, WHO. (2012). Management of Patient Information – Trends and Challenges in Member States. Bases on the Findings of the Second Global Survey of eHealth. Global Observatory for eHealth Series Volume 6. World Health Organization, Geneva, Switzerland. WHO Press Publication.

Statutory Declaration

I hereby confirm that I am the author of the thesis presented. I have written the thesis as applied for previously unassisted by others. Any material taken from other works, either as a quote or idea has been indicated under 'List of References'.

Date & Place: _____

Signature: _____

Yuni Syalfina Syam