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BUSINESS PROCESS SIMULATION IN REFERENCE DOCUMENT FILING ON HEALTH INSURANCE ("ASKES") PATIENT

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ABSTRACT

PT Askes is a State-owned enterprise that engaged in healthcare. Due to the number of participants and branches as well as the services provided by PT Askes, the business processes are often delayed ("congestion"). Modeling and simulation of business processes (BPM) and BPMN can help resolve the issue. The research method is: collecting data, modeling the system running BP, then performed a simulation of the two simulation models. Those two models are comparing and analyzed to get the optimal model. So that the number of steps is reduced from 21 to 15 steps. And then the optimal model was deploying to active designer.

INTRODUCTION

PT. Askes (Persero) is a State-Owned Enterprises (SOEs) were specially commissioned by the government to hold health insurance for civil servants, civil servants pension recipients, and some other business entities. To get health insurance from PT. Askes (Persero), health insurance participants must submit several documents as requirements. Broadly speaking, the process to obtain assurance on the health insurance is a government health agency referrals and filing patient medical record information from "Puskemas" health centers and hospitals that have teamed up with PT. Askes (Persero).

Customer satisfaction is one of the main factors that affect the success of the organization. According to John Griffith in The Well-Managed Community Hospital, administrative procedures, namely matters related to the administration of patient care starts from the hospital for treatment lasts until discharge from the hospital is one of the aspects that affect patient satisfaction.

Dharmais Cancer Hospital is one of hospitals in collaboration with PT. Askes (Persero). In the process of referral and information filing medical records, patient health insurance participants at the Cancer Hospital Dharmais not have a computerized document management system. Based on our field observation, the submission of the referral and medical record information is still performed manually by the ASKES patient participants. Patients also had to do some health insurance bureaucracy to get verification stages referral.

Documents used still in the form of paper that have the risk of missing and damaged. We are also found the rejection of the patient due to the lack of required documents to be submitted. In addition, patients have to wait longer to get a referral process. It is very time-consuming for patient that should get immediate medical care.

The huge numbers of ASKES patients who register at Cancer Hospital Dharmais make document management process more heavy and time-consuming. Therefore, we need a document management system for health insurance documents that can be well controlled to facilitate and accelerate the process of managing patient care. Automation of business processes for managing computerized patient health insurance participants can be realized with the development workflow. The business process will handle the submission process document patient with parties related to the process and the monitoring of the running system.

Based on the above, the problems that can be formulated and will be discussed in this study are:

a) How we model business process simulation for filing patient referral procedures and to optimize it.

b) How we measure the performance of Business process models for manual systems with business process models that already optimized

Given the time constraints of this research is more specifically focused on:

a) The process used based on the procedure of filing the referral of patients for health insurance. That is running on Patient Administration Installation Warranty, installation Outpatient, Laboratory, and Pharmacy installation on Dharmais Cancer Hospital.

b) This means that the observed document is a referral document and patient medical record.

c) Using open source software tool for modeling BPM & BPMN is Activiti.

Major goal of this research is to automate the business process to improve current procedures with the use of Activiti. So it can be adapted to software systems. In order to created a system to support and simplify the operations.

RELATED WORK

There are several papers related to this research. That paper was published by Bahaweres Rizal [1] and Ricard M, et al [2]. Bahaweres Rizal research focused more on the movement of paper documents. And Richard Muller research was related to health problems Table-1.

Table-1. Literature review of related work.

Author	Pro	Con
Bahaweres, Rizal Broer,et.al. 2011	This study in a system that can give information movement thesis proposal document	The scope of the system is not too large and does not involve many actors
	This system can shorten the time and step of Business Process (BP)	
Richard Muller and Andreas Rogge-Solti, 2011	This study revealed that BPM can be used in the process of health care	This study revealed that BPM can be used in the process of health care
	This study in the use of automation BPMN to simplify on business process	

A. Business process management (BPM)

Business process (business process) is a set of activities carried out, coordinated and organized. This activity brought together to achieve business goals. Each business process defined by a single organization, but it may be interacting with business processes run by other organizations. Business processes not only include a representation of a business process, but also an additional activity [3].

Van der Aalst [4], BPM is defined as "supporting business processes using methods, techniques and software to design, enact, control and analyze operational processes involving humans, organizations, applications, documents and other sources of information".

BPM life cycle (life cycle) is described by [4] [5]. Consists of 4 steps: diagnosis (diagnosis), process design (redesign) and analysis, system configuration, processes enactment and monitoring Figure-1.

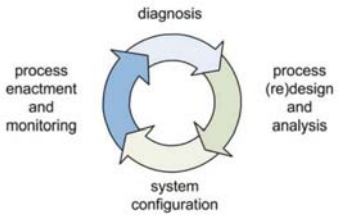

Figure-1. BPM life cycle [4, 5].

B. Business process management notation (BPMN)

Business Process Modeling Notation (BPMN) is the new standard model of business process flows and web service. Created by the Business Process Management Initiative (BPMI), the primary goal of BPMN is to provide a notation can be read and understood by all business users [6].

BPMN 2.0 is the latest version of BPMN. Here is a picture of the BPMN 2.0 notation which is comprised of: an event, activity, gateways, sequence flow, message flow [7].

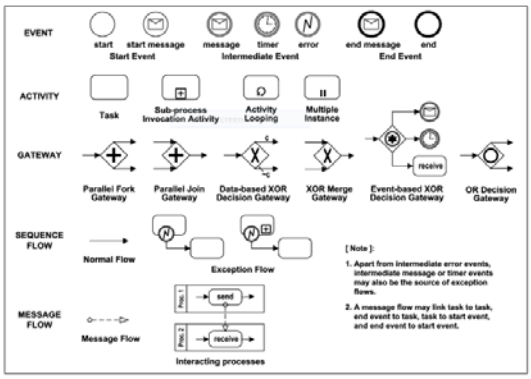

Figure-2. Overview of BPMN diagram [7].

C. Activiti

Activiti BPMN 2.0 is a process-engine framework that implements BPMN 2.0 specification. Activiti allows to deploy process definition, start a new process instance, executing user tasks, and functions display of BPMN 2.0 [8]

Activiti Engine is a state machine. Process definition of BPMN 2.0 is composed of elements such as events, tasks, and gateways are connected together using sequence flows. When a process definition is deployed by a process engine and a new process instance is started, the elements of BPMN 2.0 will be executed one by one. The process is similar execution as a state machine, where if there is an active state and based on the conditions, the execution state into another state takes place via transitions [8].

RESEARCH METHODOLOGY

The proposed research methodology is shown in the Figure-3. Starting with data collection and then model it to Business Process (BP) in the groove. Then the model of simulation 1 and simulation 2 are compared and analyzed. After getting optimal BPM simulation model then it can be deploy to the activiti designer.

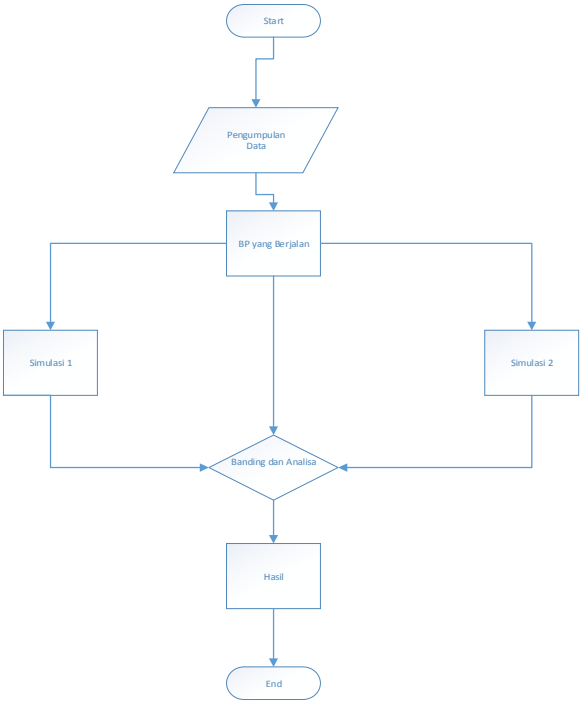

Figure-3. Research methodology.

A. Data collection

Researchers conducted interviews and observations in the business process flow referral submission. The goal is to get the data in the form of grooves filing reference, details of the time, the number of counters, the number of employees, the input and output documents and the number of participants askes the patient's arrival Business referral process begins with registration at health centers. Details of business processes can be seen in Figure-4 (detail in Appendix).

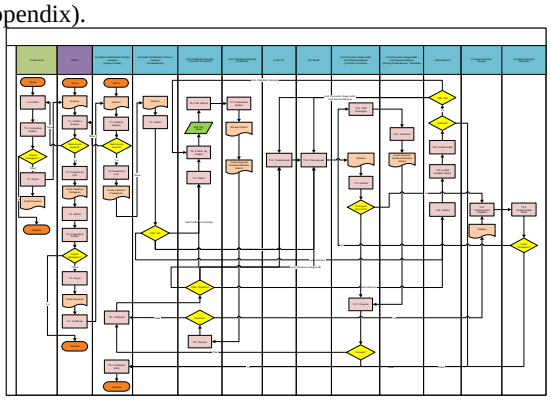

Figure-4. Business Process (BP) default.

B. Business process (BP) simulation model 1

From the results of running BP piloted simulation modeled modified, which is called by the simulation model 1. The assumption of Simulation model 1was that the patient only got one clinic visit or got 1 action in 1 day (Figure-5) (detail in Appendix).

C. Business process (BP) simulation model 2

From the results of running BP piloted simulation modeled modified, which is called by the (detail in Appendix) simulation model 2. Simulation model 2 has the assumption that the patient got maximum one clinic visit or got 3 actions in 1 day Figure-5.

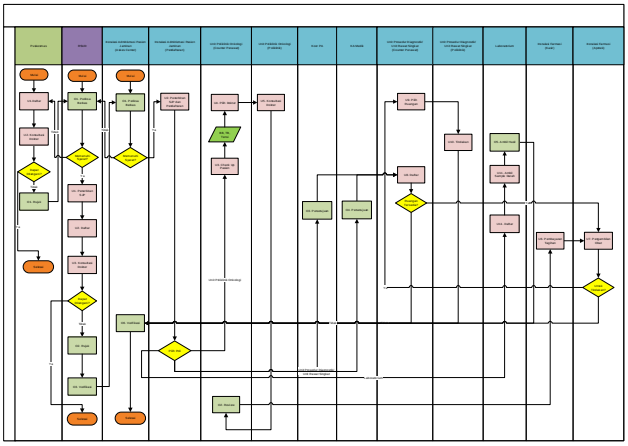

Figure-5. Simulation BP model 1.

RESULTS AND DISCUSSIONS

There are some results obtained from the data and the process in the previous section. Those results are including the results of a comparison simulation and implementation Activiti BP simulation model 2.

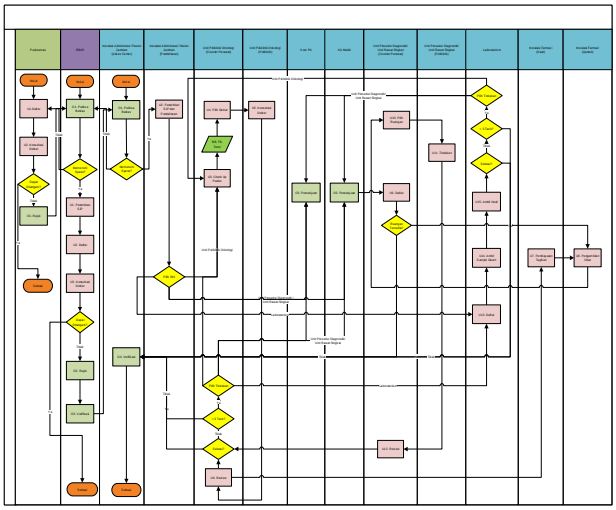

Figure-6. Simulation BP model 2.

A. Comparison of simulation model

By using queuing theory approach, it was attempted to simulate the business process model. The result of the approach is shown in Table-2.

Table-2. Comparison of simulation model.

*Parameter	Simulation model 1	Simulation model 2 (One day three task)
Workflow step	21	15
Time	348 Menit	240 Menit
Cost/day	Rp. 18.633.333	Rp. 18.033.333
Storage	Space	Digital Repository
Workflow history	No.	Yes

B. Activiti design of BP simulation Model 2

In order to be implemented into the software, then the simulation results need to be mapped into the activiti designer Appendix-A. The results of this activiti designer will be deploy into the application of workflow egine, so it can generated WS-BPEL code. Examples of software that can take advantage of (generated) BPMN results include: Alfresco, OracleBPM, etc. While the results of the mapping between tasks and actors of Design Activiti BP Simulation Model 2 can be seen in Appendix-B.

CONCLUSION AND FUTURE WORK

The conclusion of this study is:

a) The simulation techniques, BPM. BPMN modeling and Optimization can reduce the number of the user step from 23 to 21.
b) Business process cycle time for reference document filing can be reduced from 348 to 240 minutes.

The future work can be done to more realistic simulation model for BP, it is necessary to do modeling in some special cases in hospital services. For instance, periodic services to patients with specific diseases to periodic references filing.

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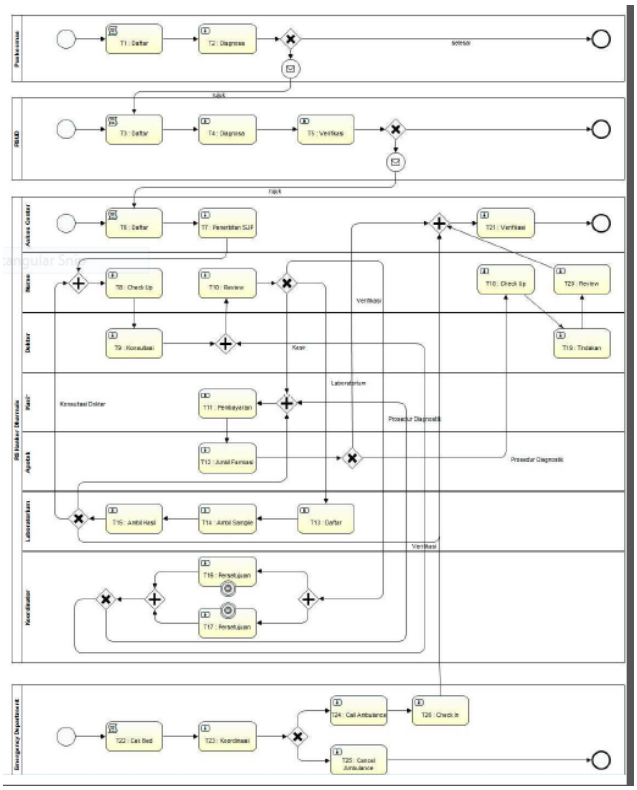
APPENDIX

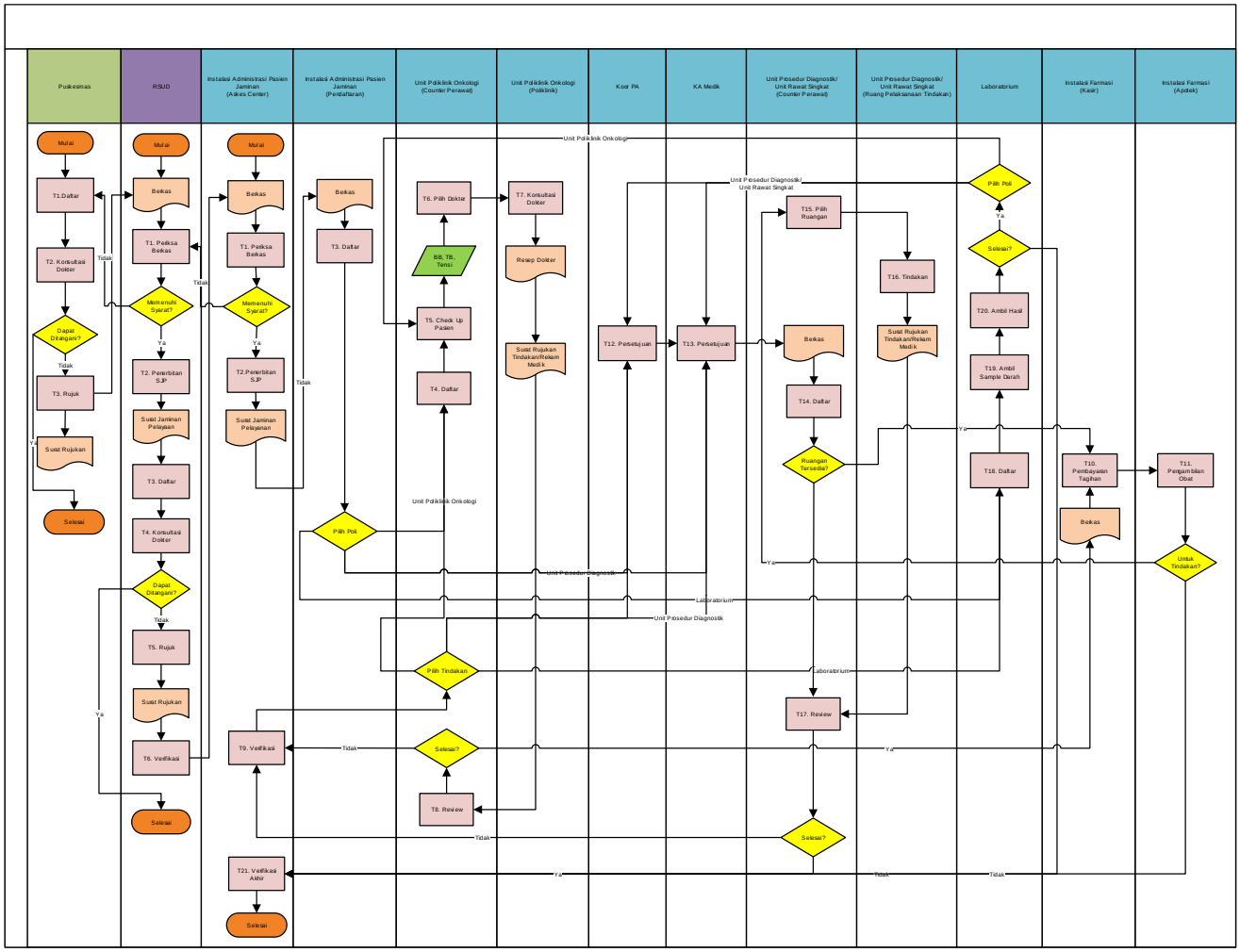
A. Activiti design of BP simulation model 2



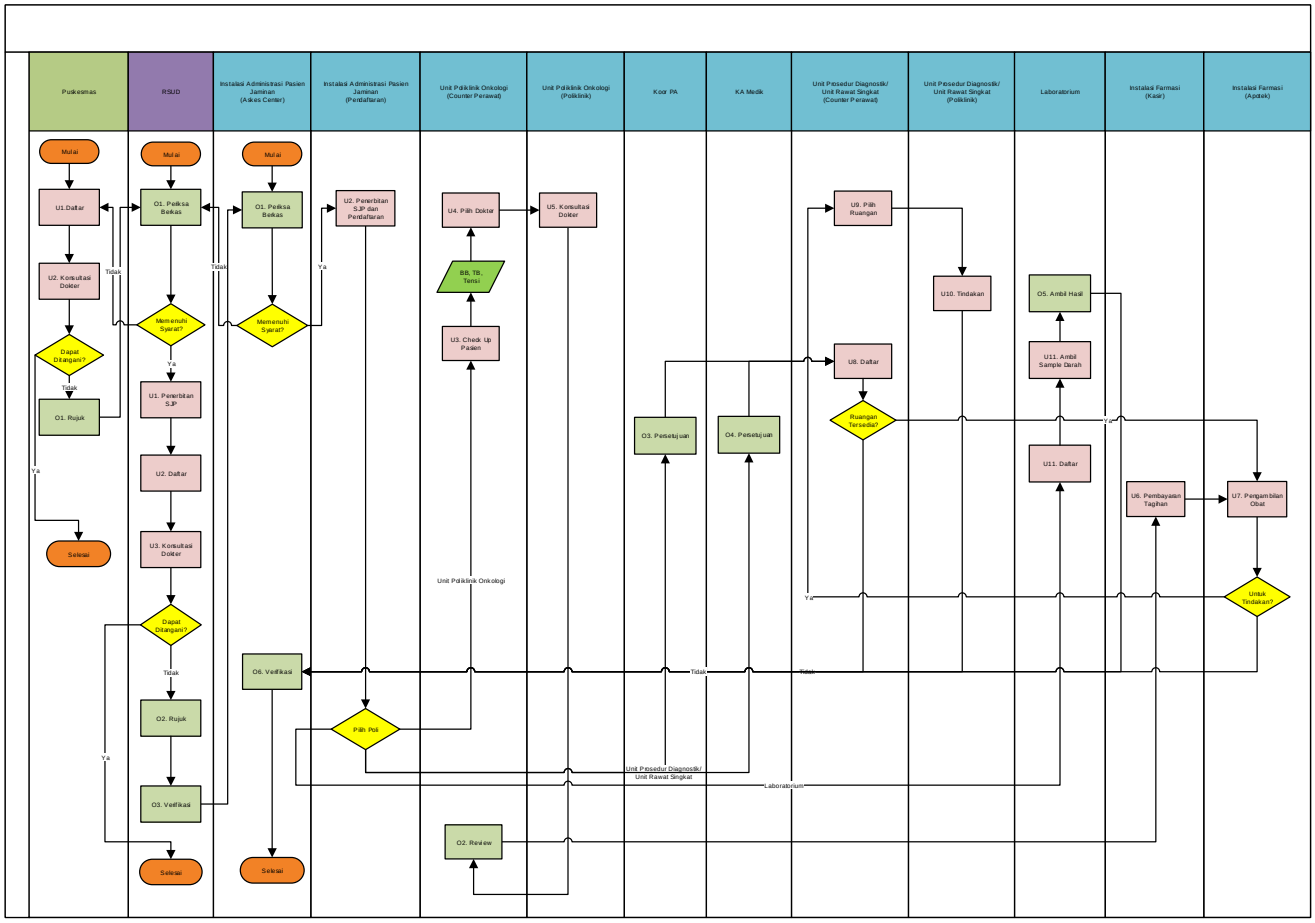
B. Business process (BP) simulation task vs actor mapping

Task (T)	Task Detail	Actor(A)	Actor Detail
1	register	1	Puskesmas
2	diagnosis	1	Puskesmas
3	register	2	RSUD
4	diagnosis	2	RSUD
5	verification	2	RSUD
6	register	3	Askes Center
7	issuance SJP	3	Askes Center
8	check up	4	Nurse
9	consultation	5	Doctor
10	review	4	Nurse
11	payment	6	Cashier
12	take pharmaceutical	7	Pharmaceutical
13	register	8	Laboratrium
14	grap sample	8	Laboratrium
15	grap diagnosis	8	Laboratrium
16	approve	9	Coordinator
17	approve	9	Coordinator
18	check up	4	Nurse
19	medical treatment	5	Doctor
20	review	4	Nurse
21	verification	3	Askes Center

C. Business Process (BP) default (as it is)



D. Business Process (BP) model 1



E. Business Process (BP) model 2