Analysis and development of company business processes using business process model notation (case study of PT Datacomm Diangraha)

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ABSTRACT

Companies in supporting activities that can achieve competitive advantage require a description of the right activities or commonly called business processes. To evaluate existing business processes so as to improve business productivity performance, every company needs to conduct business process analysis so that it is easy to understand the ongoing business processes and can improve them if needed. An important stage of business process analysis is modeling. The purpose of writing this journal is to identify business processes at PT Datacomm Diangraha and make modeling of ongoing business processes (As-Is Model). The Business Process Model Notation (BPMN) method which is a technique or method for understanding, designing and analyzing a business process is used in this research. This study uses observation, interviews and literature review to obtain data. The results obtained are the business processes at PT Datacomm consisting of the contract making process, the work design submission process, the process of paying service fees in stages (30%, 60%, 10%), providing a guarantee period, and customer service and process improvement.

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1. INTRODUCTION

According to [1], [2] a business process is a collection of activities or tasks that produce something. Each process is triggered by the factors of an event. So, a business process is a series of interrelated activities to achieve a goal, which is carried out by the system in parallel or sequentially. Usually done by people inside or outside the organization or company. Because many processes occur in an organization or company, it creates many ways to describe business processes [3].

In order to evaluate existing business processes to improve business productivity performance, every company needs to conduct business process analysis so that it can understand the existence of business processes and improve or improvise future business processes if necessary. Because change happens quickly, and many entrepreneurs wonder whether to update or replace their old strategy [4], [5]. The analysis carried out in a business process is usually done by grouping the processes and sub-processes that occur in them into activities or other activities. Business process analysis describes activities that are interrelated between one party and another [6].

Information and communication technology plays a very important role in the life of an increasingly advanced society, so that there are greater opportunities in the information and communication technology industry. Moreover, according to data from the Ministry of Communication and Information of the Republic

of Indonesia (Menkominfo), Indonesia is one of the countries with the most Internet users in the world. This can also be seen from the number of information and communication technology companies that have sprung up in Indonesia. So that it affects the competition between companies in the information and communication technology industry with increasingly fierce competition.

One of the companies in the information and communication technology industry is PT Datacomm Diangraha. The special areas handled by this company are network systems with several specializations including network infrastructure, network security, network management, and applications. This company provides services to customers ranging from design, development to maintenance of network systems.

PT Datacomm Diangraha is a company whose type of business is b2b, namely a company that carries out transactions or business between organizations or companies. There are 3 categories of customers, namely the Telco category (Telkom, Telkomsel, Indosat, XL), the Government category (Pemprov), and the Defense category (University of Defense, Ministry of Defense, TNI Headquarters, Army).

Business Process Model Notation (BPMN) is an information flow of a business process which is represented by several symbols. BPMN offers a way to describe business processes with the aim of describing software modeling and has the possibility of helping managers and workers understand how to carry out their duties [7]. According to [8], BPMN is a graphical representation to visualize business processes in the form of Business Process Diagrams (BPD). The main goal of BPMN is to provide a notation that is easily understood by business people [9], [10]. Initially, the business analyst will draft the process, then it will be handed over to the Developer engineers who are responsible for its implementation, and finally to the Business People who deploy and monitor the process.

BPMN was first released by Business Process in 2004. The Modeling Initiative is represented by graphical symbols (partially inspired by UML) activity diagrams where there is a graphical layout representing the business processes. The company's interest in adopting this notation has led to the adoption of BPMN as an OMG standard in 2006.

BPMN has four types of graphic elements, namely Swimlane, Connecting Object, Artifact and Flow Object. Swimlane is a mechanism to regulate and separate roles or people who are responsible for the process. The notation is pool and lane [11]. Pool is a container that represents a process. If Lane is a partition of a process that can indicate sub-organizations, positions, and determine who is responsible for part of a process. Connecting object elements consist of sequence flow, message flow and association. Sequence flow is a sequence of activities to be carried out, and is shown as a straight line with an arrow. Can allow conditional flow or default flow. Message flow describes messages flowing across "clusters" or organizational boundaries (such as departments). But can't connect event or activity in pool. Depicted by a dotted line, with a circle at the beginning and an arrow at the end. Association is shown by a dotted line. This element connects the artifact or text to events, activities, and gateways. To get detailed information from BPMN diagram Artifact Notation is required. There are three types of Artifacts, namely data objects, groups, annotations, and data stores. Data objects are files and documents that are used and obtained from an event or activity. Group is a grouping of several flowing objects. Annotation is an explanation of the flow object. Finally, the data store is the use of the system or application generated from the activity. Flow object elements represent the core elements provided by BPMN and linking objects serve as associations between flow objects [12] includes events, activities, and getaways. Event types include message, timer, error, compensation, signal, cancel, upgrade, link, and so on. These events are indicated by circles containing other symbols. Activities represent specific tasks performed by a person or system. Symbolized by a rectangle with rounded corners. Gateways are decision points that can adjust paths based on conditions or events. Gateways are symbolized in the form of diamonds, which can be of various types, including exclusive, event based, parallel, inclusive and so on, based on data or events. The exclusive gateway evaluates the status of the business process and divides the flow into one of two or more mutually exclusive paths based on this condition. Event based events are almost the same as Exclusive in that they both involve paths in the flow. However, in the case of an event-based gateway, it evaluates which events have occurred rather than which conditions have been met. Parallel gateways are used to represent two concurrent tasks in a business process. At the same time, the inclusive gateway divides the process flow into one or more streams.

Using BPMN also can help find improvisations that can be made to the plot. Improvement is a continuous effort to develop and improve a product, service, or process. These efforts are aimed at finding and maintaining the best form of improvement that is produced, which is the best solution to the existing problems, the results of which will continue or even develop. In the case of this study, improvement can be measured by comparing the process before and after [13], [14].

Compared to other business processes (such as Unified Modeling Language (UML), flow chart technologies, Data Flow Diagrams (DFD), etc.), the advantage of using BPMN is that the standard syntax is well defined. BPMN makes it easy for business analysts to collaborate with each other. In addition, most modeling tools support BPMN, although the software used is different, they can be easily shared and edited. All these advantages make BPMN the most popular business process modeling technology today [14][16].

In writing this study the author uses the Bizagi tool to help model BPMN. Bizagi is a tool for creating, optimizing, and displaying workflow charts for business process modeling [17], [18]. Bizagi is recognized as a leading BPMN solution tool that can showcase popular design, automation, visual graphic environments and standard graphic symbols to realize and improve business processes [19]. In this study the author uses the Bizagi modeler which is a free Business Process Model and Notation (BPMN) business process modeling application [18], [20].

Therefore, the purpose of this study is to analyze the ongoing business processes (As-Is Model) of PT Datacomm Diangraha using Business Process Model Notation (BPMN) and present business process improvisations. This journal has the following structure: part 2 of the research methodology, in this journal there are 2 data in data collection, namely primary and secondary data, then making business process flows using BPMN. Then analyze the BPMN process. And finally, there is a conclusion.

2. METHOD

In this study, the authors conducted observations and interviews with PT Datacomm Diangraha for primary data collection and literature studies for secondary data collection. For analysis using Business Process Model Notation (BPMN) and modeling business processes in the form of business flow diagrams of BPMN elements using the Bizagi application. The object of this research is PT Datacomm Diangraha.
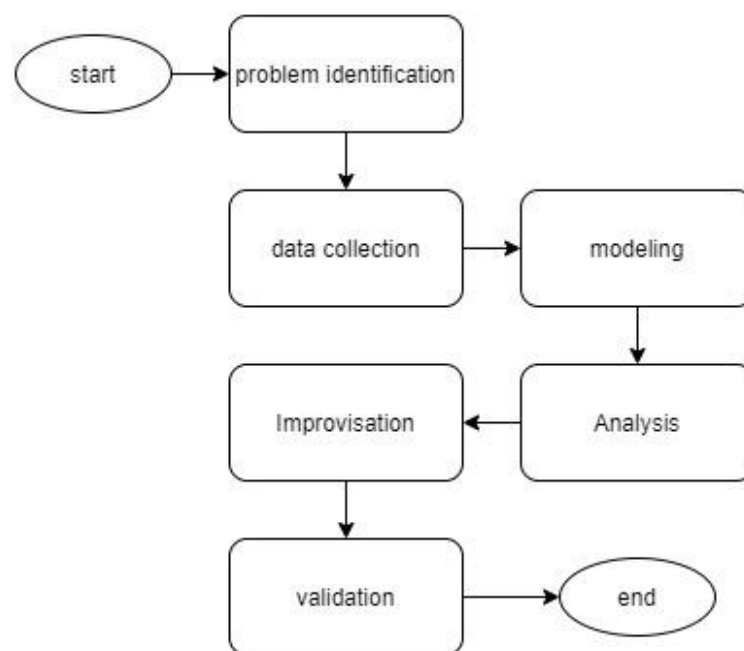

Figure 1. Research Flow

The author also conducted interviews to validate the improvised BPMN to find out whether the BPMN was acceptable and provided benefits for PT Datacomm Diangraha.

3.   RESULTS AND DISCUSSIONS
3.1. Business Process

Based on the results of observations and interviews, the core business processes and supporting business processes carried out by PT Datacomm Diangraha are shown in table 1 below.

Table 1. Core and supporting business processes at PT Datacomm Diangraha

Core Business Process	Supporting Business Process
a. Order acceptance b. Order Fulfillment: − Design creation − Design submission − Contract submission − Project creation − Project handover	a. Customer service : − Warranty − System maintenance

The core business processes at PT Datacomm Diangraha involve the Client, the Datacomm website and all divisions at PT Datacomm Diangraha, namely Customer Service, Service Manager and Developer. Activities in ongoing business processes (As-Is Model) at PT Datacomm Diangraha are modeled more clearly with BPMN as shown in Figure 8.

3.2. BPMN

Figure 2. BPMN on Datacomm Company business processes

The following is an explanation of the business process flow at the Datacomm company:

1. The client opens the Datacomm website to get information about the services provided by Datacomm. In addition to information about available services, clients can find contact persons if they are interested in using Datacomm services.
2. After selecting the available services, the Client contacts the Datacomm.
3. Customer Service at Datacomm will accept the Client first. Here Customer Service will collect data from the Client in the form of the Client's identity and the service to be selected. The data will later be given to the Service Manager.
4. Service Manager will make a work contract that will be submitted to the Client. In this section, the discussion of making a work contract will continue until both parties agree.
5. The work contract received by the Client will be reconsidered. If there is a shortage or there are some parts that need to be changed, the Client will contact the Datacomm Service Manager to revise his work contract. If there are no deficiencies and both parties have agreed to it, the employment contract will be signed by both parties.
6. After the work contract is made, the Client will pay an advance of 30% of the total cost of the service he has chosen.
7. The Service Manager will contact the Developer and send a Client service request.
8. The developer will make a work plan according to what is requested by the client. After the work plan is made, the Developer will submit the work plan to the Client for viewing.
9. The client who has received the work plan will perform a Proof of Concept (POC). In this section the Client will analyze the work design that has been submitted by the Developer. If the work design is deficient, the Client will contact the Developer for improvement. This process will be repeated until the work plan is approved by the Client.
10. The project will start after the work plan is approved.
11. After the project is completed, the Client will pay 60% of the total cost of the selected service.
12. After making the payment, Datacomm will provide a guarantee. The warranty period varies according to the agreed contract. The average warranty period provided by Datacomm is 1 year.
13. After the warranty period expires, the Client will pay the remaining payment, which is 10% of the total service fee that has been selected.

3.3. Improvement
3.3.1. CRM Process

From the results of observations on the Datacomm website and interviews with one of Datacomm's parties, the authors found that the assessment process for each service provided by Datacomm is still internal. On the Datacomm website there is no display of Client assessment results and Client reviews for services that have been selected. Therefore, the author makes developments by adding Customer Relationship Management (CRM) on the Datacomm website.

The author first designs an external assessment process that will be applied to the Datacomm website. After making the design, the author conducted a validity test by interviewing one of the Datacomm parties. After conducting the validity test, the authors found that the development for the external assessment proposed by the author could be considered to be applied to the Datacomm website. The CRM process flow is shown in figure 9.
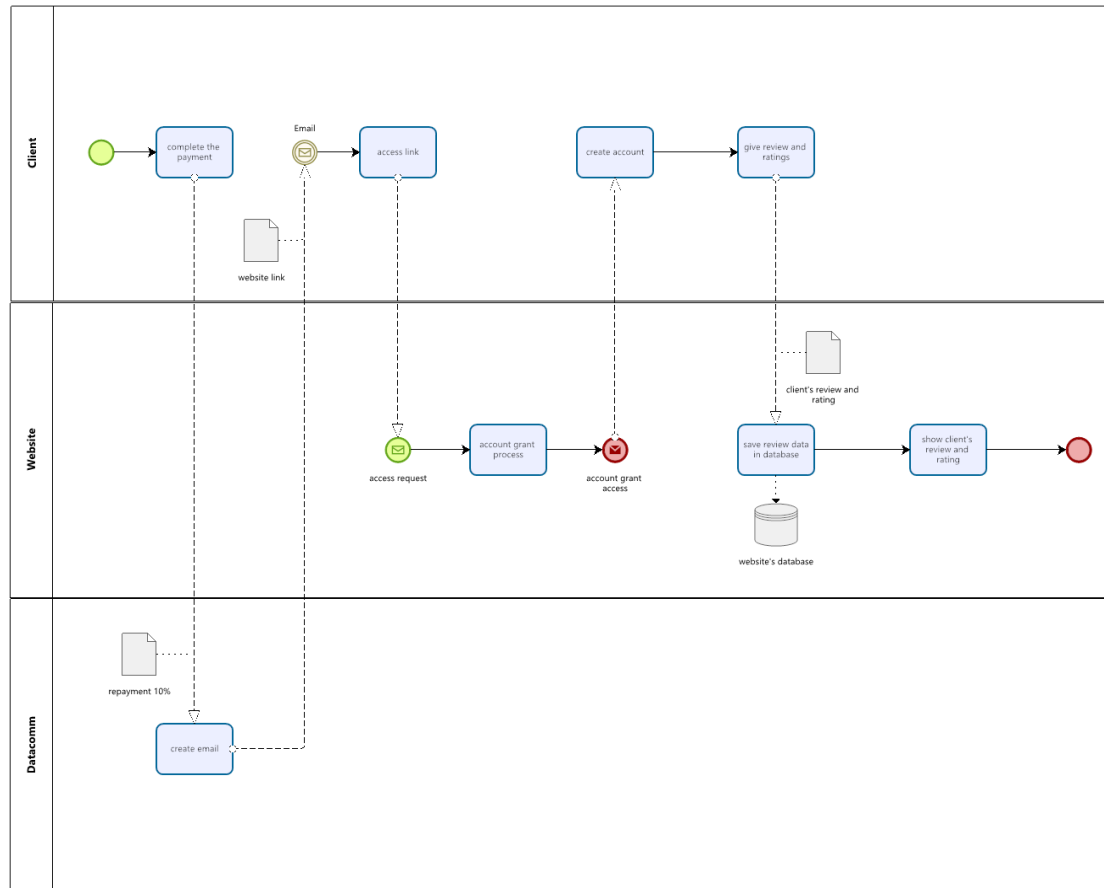
Figure 3. CRM process

3.3.2.   BPMN Improvisation Results

The following is an explanation of the business process flow at the Datacomm company:
1. After the Client pays the payment, the Service Manager will send an email in which there is a link to the Datacomm website.
2. On this link, the Client is given access to create a user account. The Client will fill in his/her identity and provide an assessment and review about the services that the Client has chosen.
3. The data will be stored in the database and displayed on the Datacomm website as an external assessment from the Client.

3.3.3.   Analysis of Improvement Results

To measure the improvisation, which the writer mentioned earlier, is to use the analysis of performance measures, which consist of effectiveness, efficiency, and productivity. The following are the results of interviews conducted with employees of PT Datacomm Diangraha in Jakarta regarding the performance measures of the proposed Business Process Model and Notation (BPMN), as follows:

Table 2. Analysis of proposed BPMN performance measures

No	Performance Measure Criteria	Information
1	**Effectiveness**	CRM can help clients in interacting indirectly with the company. The form of interaction in question is a one-way interaction, which uses an external assessment. Prospective clients can see the quality of the services provided by Datacomm based on ratings from other clients. This can help clients in making future decisions.
2	**Efficiency**	CRM can maximize time to sales, faster quote/quotation approvals and faster report updates.
4	**Productivity**	CRM can evaluate a work culture system that aims to increase employee productivity. With external assessments, Datacomm can identify weaknesses and strengths based on the client's perspective. These deficiencies will later be re-evaluated and discussed so as not to hamper employee productivity.

4. CONCLUSION

The results of business process research at PT Datacomm Diangraha identified that the core business processes involve the Client, the Datacomm website and all divisions at PT Datacomm Diangraha, namely Service Manager, Customer Service and Developer. The business processes include the contract making process, the work design submission process, the service fee payment process in stages (30%, 60%, 10%) and the granting of a guarantee period. In addition, from the results of the study it was also found that PT Datacomm Diangraha was still conducting internal assessments, where the assessment was still carried out by Datacomm itself. External assessment is one of the most crucial parts of the business process. In response to this, development in the form of adding an external assessment process for the Client is highly needed and recommended.

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