

REENGINEERING PROCESS FOR REDUCING TIME OF PROCUREMENT AND INVENTORY PROCESS IN TELECOMMUNICATION TOWER COMPANY WITH IDEF0 TOOLS AND ESIA METHOD

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ABSTRACT

Increased development of telecommunication industry, including telecommunication tower provider companies require them finishing construction of the tower in accordance with the customers demand. Business Process Reengineering methodology used to shorten the time of the procurement with the help of the IDEF0 method, mapping the process through interviews and forum group discussions with six experts. With ESIA method, this research resulted in As-Is and To-Be processes in project procurement and construction of the tower can be shorten processing time up to forty percent.

Keywords: Reengineering Process, IDEF0, ESIA Method

1. INTRODUCTION

The telecommunications industry in Indonesia is growing rapidly and very competitive increase. Telecommunication operators provide a diverse supply of their products to the public, the competition must be supported with a good signal quality or supporting sectors including conducting establishment towers or telecommunications tower that is scattered all over indonesia.

With high growth and many number of competitors in this industry, as well as a limited number of customers, company must required to complete each tower construction project with the right time, fast and also with competitive prices.

Supply of materials for tower construction project in a right time is one of the critical success factors of a project. Delay in material supply and inventory of materials may result delays in the completion of a project, the impact would be complaints and customer dissatisfaction.

A growing number of consumer complaints received by the company due to lack of projects timely cause delay in supply of materials is an indication that there are problems to be solved within the company. Many things in the company resulting from the previous processes result in a delay. This includes the procurement and inventory process is not effective and efficient.

Delays caused by the supply of material procurement and inventory process will be a case study in this research, it is necessary to reengineering the business process in the procurement and inventory with the goal to provide ontime in the supply of materials for a project

2. THEORETICAL BACKGROUND

Business Process Reengineering (BPR) has emerged as a solution for companies to improve performance, efficiency and gain a competitive advantage (Goksoy & Beliz Ozsoy, 2012). BPR identify reasons for improving inefficient business processes, restructure the business functions, and improve the position of the current industry (Whitman, 1996). Observed from the study that 75-80% of the companies IBM, Texas, Johnson & Johnson, Ford, Shell, American Express, Wall-Mart, TacoBell, Hewlett Packard almost all apply reengineering and achieved remarkable success (Srikanth, 2012). Some of the headlines in the popular media, "Wal-Mart reduces restocking time from six weeks to thirty-six hours". "Assembly time Hewlett Packard for the server computer touch under four minutes". "Sales Taco Bell increased from \$ 500 million to \$ 3 billion "The reason behind this

success story is the Business Process Engineering (Grover, 1997).

2.1 BUSINESS PROCESS REENGINEERING (BPR)

BPR was first introduced by Davenport, Short and Hammer in 1990. business reengineering as the "fundamental rethinking and radical redesign of an entire business system, to achieve dramatic improvements in critical measures of performance". Reengineering has a many definition than just a process (Hammer, M & Champy, J, 2001). Reengineering is not about fine-tuning or marginal changes. It is for ambitious companies that are willing to make substantial changes to achieve significant performance improvements (Gunasekaran.A, 2002). BPR also as a management tool, in which business process examined and redesigned to improve the cost efficiency and effectiveness of service (Grover, 1997).



Figure 1. Major component factors of BPR
Source: (Soung Hie Kim, 2002)

Effective BPR involves understanding existing process defects, identifying sources of inefficiency, and redefining processes to increase efficiency or decrease errors (Goel, 2008).

2.2 BUSINESS PROCESS

(Davenport, 1990) define business process as "a set of logically related tasks intended to achieve a defined business outcome". A process is "a structured, measured set of activities designed to achieve a specified output for a particular customer or market". A process as a collection of activities that takes one or more inputs and produce outputs that provide added value to customers (Hammer, M & Champy, J, 2001). A business process is composed of

two types of processes are the main processes and supporting processes, depending on whether a process is directly involved in the creation of generating added value for customers, or internal to the organization's activity concentration (Goksoy & Beliz Ozsoy, 2012).

To be able to determine the problem and find the process to be reengineering on the business processes that applied in the the company should be conducted analysis to the process. Basically there are three types business process analysis (BPA) validation, verification, dan performance analysis.

2.3 INTEGRATION DEFINITION FOR FUNCTION (IDEF)

The Integrated Definition for Function Modelling (IDEF) is a family of methods that supports a paradigm capable of addressing the modelling needs of an enterprise and its business areas (Aguilar-Saven, 2004). The IDEF0 (function modelling method) is designed to model the decisions, actions, and activities of a manufacturing organization or system in a structured graphical form. It provides users with a powerful means of analysis and development for the manufacturing enterprise (Soung Hie Kim, 2002).

IDEF's roots began when the US Air Force, in response to the identification of the need to improve manufacturing operations, established the Integrated Computer-Aided Manufacturing (ICAM) program in the mid-1970s (Aguilar-Saven, 2004). An IDEF0 model is represented with rectangles with four different types of arrows surrounding the rectangles. A rectangle represents a function or activity described in a *verbal* phrase, and arrows represent (1) "Input" (on the left); (2) "Output" (on the right); (3) "Control" (on the top); and (4) "Mechanism" (on the bottom) called (ICOM) described in a *noun* phrase to explain the behavior of the function (Ki-Young Jeong, 2009).

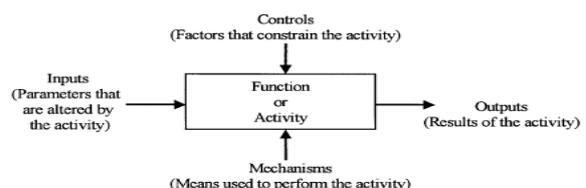


Figure 2. Main Diagram IDEF0
Source : (Ki-Young Jeong, 2009)

Inputs : items that trigger the activity controls : guide or regulate the activity mechanisms : systems, people, equipment used to perform the activity output : results of performing the activity (Abbas Toloie Eshlaghy, 2009).

IDEF0 models is the notion of the hierarchical decomposition of activities. A box in an IDEF0 model, after all, represents the boundaries drawn around some activity. Inside the box is the breakdown of that activity into smaller activities, which together comprise the box at a higher level. This hierarchical structure helps the practitioner to keep the scope of the model within the boundaries represented by the decomposition of the activity (Soung Hie Kim, 2002).

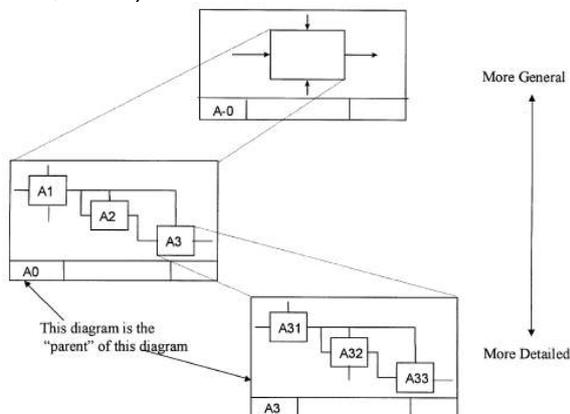


Figure 3. Decomposition construction of an IDEF0 model.

Source : (Soung Hie Kim, 2002)

2.4 ESIA METHOD

When redesigning an existing process, non value adding activities should be eliminated, the remain process should be simplified, the simplified tasks should be integrated and basically sound process should be automated when implement BPR, it is called ESIA method (Elimination, Simplify, Integration, Automation) (Peppard, 1995) :

1. Elimination

Eliminate process means elimination existing process, because it is not necessary or can be replaced by an entirely new process. Processes that eliminated are all processes that not have value added.

2. Simplify

After doing a process of elimination for not required process, the remaining process needs to be simplified.

3. Integration

Combining the processes into one process, the main objectives has been simplified then integrated with objective a smooth process flow.

4. Automation

Automation is closely related to the use of information technology, the automation should be applied after eliminating, simplifying, and integrating process.

3. RESEARCH METHOD

3.1 IDENTIFICATION OF BUSINESS PROCESSES

Identify the business process that is currently running in order to describe the work process at this time, so they can be identified improvement.. From interviews and expert evaluation in the company, it can be concluded the major processes of procurement and inventory of materials in the telecom tower provider company as follows:

1. Material request process.
2. Procurement process.
3. Purchasing process.
4. Material receipt and inventory
5. Material outbound process

Beside the above main processes there are also have several sub-processes inside.

3.2 Developing Business Process Models Using IDEF0

Existing business process on the company identified using IDEF0 using iGrafx software, this identification is gradually generated after identifying the major components of business processes and information. Steps IDEF0 modeling are Existing activities in the procurement and inventory process is described using a hierarchy of components as shown below :

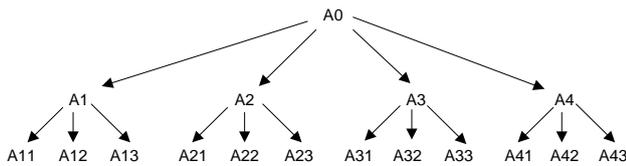


Figure 4. Hierarchy Component Procurement and Inventory Process.

Existing business processes are described and modeled using IDEF0 using iGrafx software.

- Function = main function
- Input
- Control = procedur
- Mechanism = department.
- Output

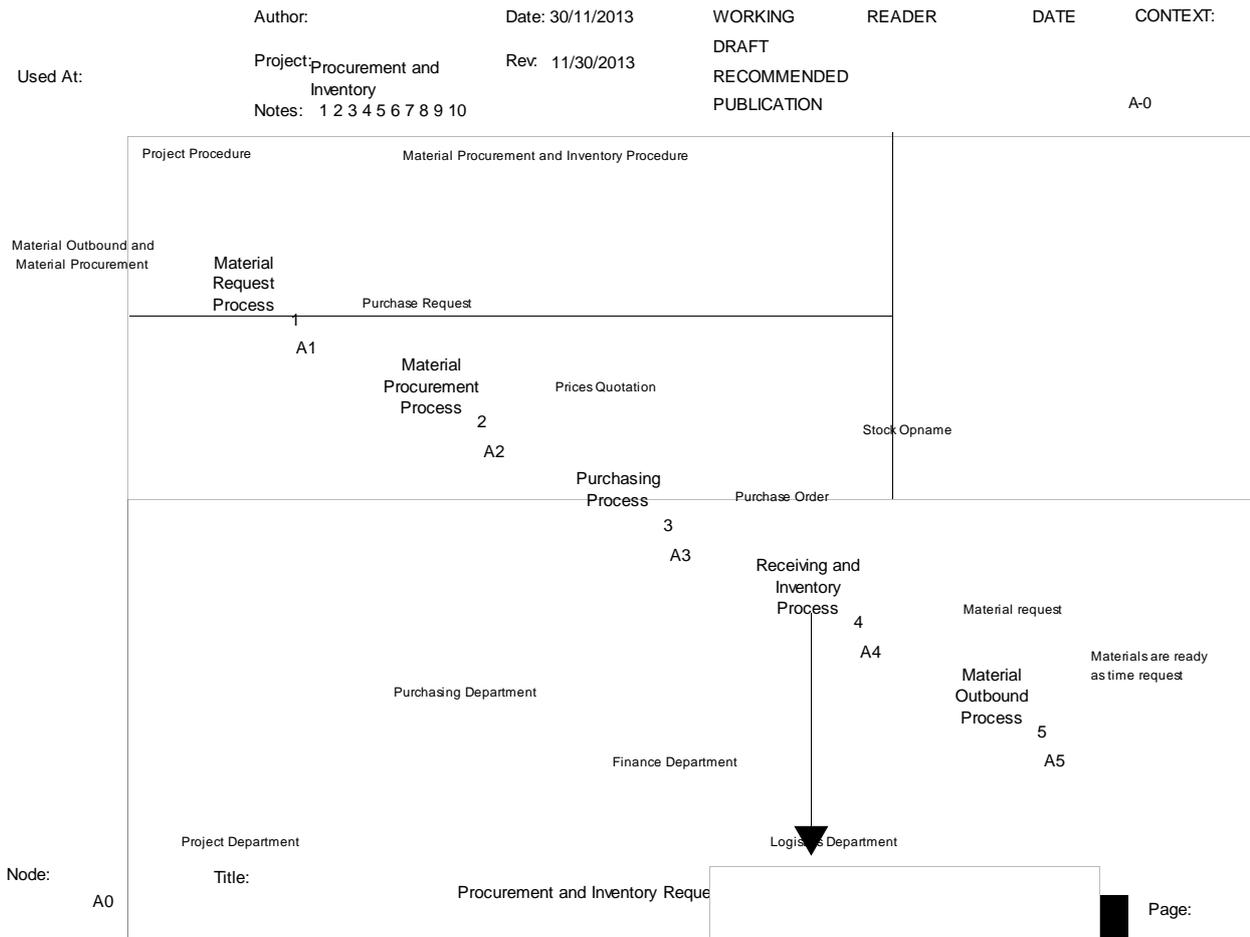


Figure 5. IDEF0 A0 Procurement and Inventory Request Diagram

After A0 Top level modeling is done, then performed a bottom-up modeling to A0-child diagram procurement and inventory request, this means decomposed into five process in the second level. and these processes are then associated with their inputs, mechanism, control and outputs are shown in Fig.5

3.3 PROCESS CHART

Business processes As-Is that have been identified using IDEF0, then mapped using

process chart to find out the details of the process flow with details of time for each process.

Fig.6 illustrates the process chart of the procurement process, there are 13 activities in the procurement process with the total processing time for 15 days and 860 minutes. Once all processes already mapped using the process chart, obtained the total time of all process are 51 days and 1615.

Forum Group Discussion (FGD) was conducted to identify the processes that most affect total time the process of procurement and inventory of materials, FGD followed by 6 expert from company and 1 moderator (the author), and the result is a process and sub process that will be need improve due the process identified most influence on the total processing time.

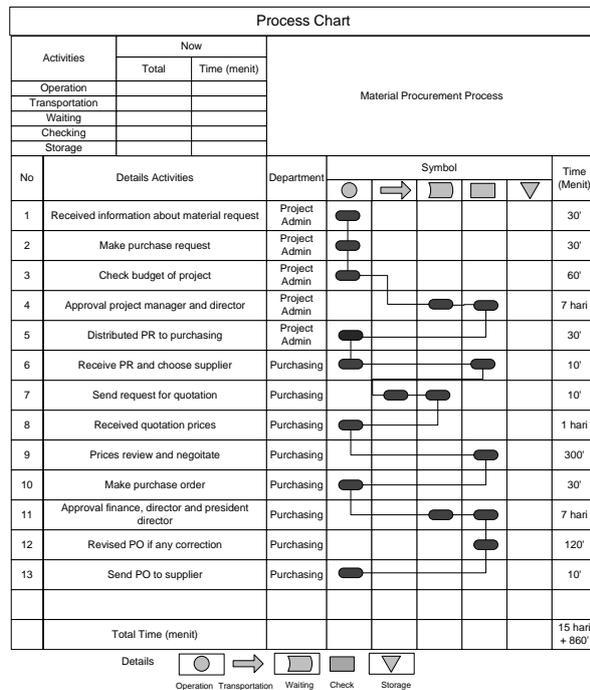


Figure 6. Process Chart Procurement Process

Fig. 7 describe the activities in the sub-process of requesting approval of Purchase Request (PR).

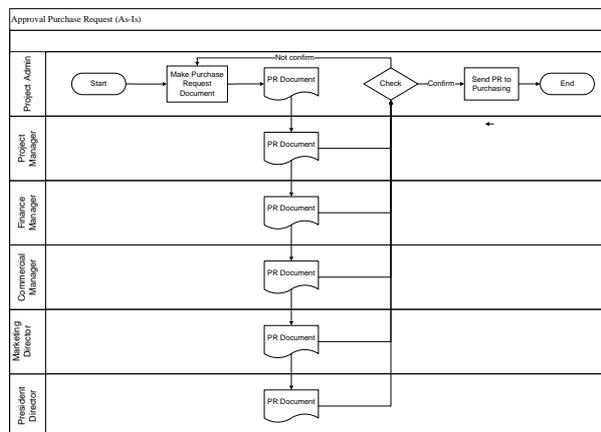


Figure 7. The flow of sub-process of requesting approval PR to Project Manager and Director (As-Is)

ESIA Method use for improve process with that has no value added, Eliminating process means a elimination the process or delete, because it is not necessary or can be replaced by an entirely new process, Simplify the process because too many sub process inside and not efficient, Integration the processes into one process. The task has been simplified then integrated with the result a smooth process flow, Automation is closely related to the use of information technology, the automation should be applied after eliminating, simplifying, and integrating. IT processes means the support of computerized technology, communication and automation of some processes.

4. RESULT AND DISCUSSION

FGD team work give some ideas and solutions to the ideal mapping process. Furthermore, these suggestions were collected and team work together with coordinator proposed innovation or improvement. Suggested new process is represented in the model "To-Be" (M. Bevilacqua, 2012). Tabel.1 present how to improve sub process requesting approval PR based on their activities.

Improvements were made to the sub process started by reducing the number of approvals from the previous 5 times to 2 times. The result of the discussion the team decided approval marketing director, commercial manager, and finance manager will removed because in the making purchase request (PR) for the purchase or procurement no need their approval.

Tabel. 1 Sub Process requesting approval PR

Before BPR	Time	Improvement
Requesting Approval PR	7 Days	Eliminate the amount of 5 approval proces into two important approval, other approvals will receive an document copy

Before BPR	Time	Improvement
		after approval PR completed.

PR document that is so will be given to them as a document file or copy, by removing 3 step of approval FGD team estimated the total time can be reduced from 7 days to 3 workdays. The next step adds the PR document checking activity on every any approval process, this activity aims to make improvements to the document immediately, if document reject or need revised.

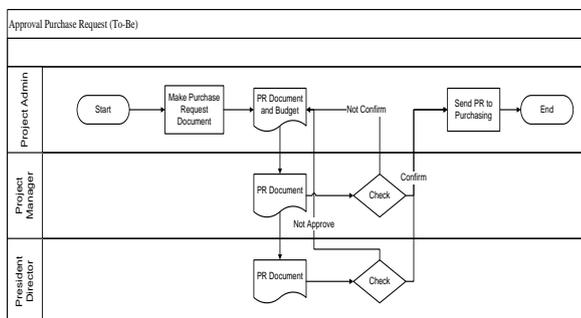


Figure 8. The flow of sub-process of requesting approval PR to Project Manager and Director (To-Be)

After improvement all sub process the result of the FGD, then do a comparison of total time As-Is and total time To-Be, final result after As-Is process improvement, total process time can be reduced by 46%.

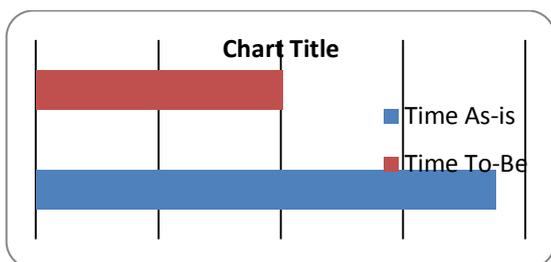


Figure.9 Comparison total time of As-Is and To-Be

5. CONCLUSION

In this study resulted the complete model IDEF0 methods that provide information functions (ie, activity, action, operation process), a systematic description of the

system and sequence, making it easy to understand the procurement process and inventory.

Process chart analysis identify the total time from order entry until material outbound to project takes 51 days in 1615 menit. Forum Group Discussion (FGD) was conducted to identify and produce the 3 sub-process consists of 6 activities that most affect total time of procurement process and inventory. improvement of business processes shows can reduce processing time from receipt order from customer until material outbound takes 27 days and 1445 minutes. Comparison of total time before and after improvement process, can shorten the processing time by 46%.

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[http://dx.doi.org/10.1016/S0378-7206\(96\)01046](http://dx.doi.org/10.1016/S0378-7206(96)01046).

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