A Proposed Model to Improve the Procedure's Quality Information System at PT. PS – CNC Department

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***Abstract*—PT. PS is a manufacturer for the precision machining part. Currently PT. PS has a new project that supplying the aircraft parts to Europe. This new project has a specific different procedure compared to other common projects in Indonesia. In this project, all the materials, production activities, subcontract activities, used to produce goods, have some documents and certificates that have to be attached. The whole processes and documentations will be reported to customer and monitored by UTAS, so PT. PS should improve their system information management's quality. There is a new proposed procedure model which related to information system's documentation that always occurs from start to end of the process. Modeling based on Design for Six Sigma Method, which refers to Identify, Design, Optimization, and Validate steps are derived.**

Keywords—Quality; Procedure; DFSS; IDOV

I. INTRODUCTION

PT. PS is company that doing business in precision machining part, specializing in products such as aeronautical parts, automotive parts, mechanical parts, equipment parts, etc. This research is focused on the new project for PT. PS which produces some of the aircraft parts. As being new for PT. PS, they still haven't acknowledges for an appropriate procedure used for the project.

PT. PS orders the good materials from a qualified suppliers which approved by customer and can provide material certificates. The supply chain staff always monitors this project started from the purchasing until the delivering of goods to customer. The supply chain staff working together with a quality teams are also responsible for some processes after productions which are also the special process to sub-tier. Some of the parts need a special process before it becomes a finished product.

This process chain must refer to the customer's specification and standard rules. Every process contains its documentations and will be attached to products then sent to customer.

II. THEORETICAL BACKGROUND

A. Quality

Quality is the totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs (ISO 8402). According to El-Haik and Yang (2003), by examining quality definition, it can find that "on its ability to satisfy stated or implied needs" means that the product or service should be able to deliver potential customers' needs; call it "doing the right things," and "free of deficiencies" means that the product or service can deliver customer's needs consistently. It can call this "Doing things right all the time."

B. DFSS Phases

According to El-Haik and Yang (2003), the major objective of DFSS is to "design it right at the first time" and also to avoid the painful downstream experiences. The term "Six Sigma" in the context of DFSS can be defined as the level at which design vulnerabilities are *not effective* or minimal. DFSS has the following four phases, listed as:

1) Identify requirements
2) Design/ Characterize the design
3) Optimize the design
4) Verify the design

C. DFD

According to Hui shen (2004), DFDs model system is a network of activities connected to one another by pipelines of objects. DFD is also a model of holding tanks called the data stores, and external entities, which represent the interfaces with an objects outside the bounds of the system being modeled. The advantage of a DFD is that it can describe an information flows clearly, from the source to the destination.

III. METHODOLOGY AND RESEARCH APPROACH

From the applied methods perspectives the project may be divided into a following chronological sequence of four steps.

A. Identify

1). Problem Statements

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Generally, every product has a long process chain and many persons are involved in the process. Usually, the processes need a long time to do and various places even in the factory or other places, such as sub-tier. All of processes must refer to the customer's specification and the international standard rules especially for the aircraft parts. If they can't fulfil it, the product will be rejected. The information related to the product will be documented and attached to the part itself. Being new to this situation, the procedures made by PT. PS still has some mistakes or defects and that could be used for this process. These obstacles will impact the UTAS's quality review and the shipment to customer. So PT.PS must understand to improve their knowledge about how to make the appropriate procedures and information systems of the project.

2). Voice of Customer

There are some important things related to this project:

a). Material's specifications must be the same with customer's orders.
b). Material must have a supplier certificate.
c). Production must refer to the customer specification's inspections.
d). Special process must refer to a drawings and PO.
e). Special process must refer to the newest level issue from the customer.
f). All documentations must be attached to the products and certified.

3). Critical to Quality

For procedure of this project, there are only two critical mistakes that should be considered. First, all the processes and documentations must refer to the customer's specification. Second, the information that stated in documents could not be wrong. Customer will not accept the products even if only one mistake occurs. So PT.PS needs to concern both the processes and the document information.

B. Design

The following procedure model is developed based on DFSS phases as shown in the figure 1.

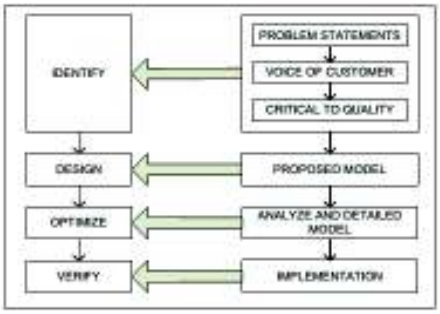

Figure 1. The procedure model

C. Optimize The Design

The result of this phase is the procedure model that shows the more details steps that occurs in PT. PS. The detail of model is showed in figure 2.

Figure 2 illustrated a work flow structure that is developed at PT. PS. It started from order of customer to marketing team, and then marketing team informs inform engineering team. Engineering team will process and translating customer's order to bill of materials. Supply chain staff will receive bill of materials information and make a request for quotation to supplier. Supplier offers the materials and supply chain will give approval to release purchasing order. Supplier process and deliver the materials with all documents and certificates. PPC scheduling the plan and engineering start the production as PPC planned.

If the part (product) needs special process, then supply chain will coordinate to release purchase order and arrange for shipment. Sub-tier receives the part with all documents, and then do the special process and send back the materials with their certificate and whole documents to PT.PS. Finally, the UTAS quality engineer will review the part and all the documents and then send it to PT. PS for a approval and send it directly to the customer. The detail documents and information flow structure are illustrated in figure 3. All documents and informations will be attached along with the materials and part (product).

D. Verify The Design

The procedure will be implemented to the project activities. The customer issues and requirement will be considered in the daily project activities with the objective to minimize mistakes or defects and lead to deliver the parts.

IV. RESULT AND DISCUSSION

A model of research has been derived that will be used to improve the quality of procedure of information system. The model is based on the DFSS methodology.

REFERENCES

[1] Cobham, D., & Curtis, G. (2005). *Business Information Systems: Analysis, Design & Practice*. Pearson Education UK.
[2] Curione, E. F., Corrêa, V. A., do Patrocínio Nunes, L. E. N., & Godoy Jr, E. (2013). *Design For Six Sigma (Dfss) Application Focusing Automotive Connection System Design Improvement*.
[3] Patil, V. S., Andhale, S. R., & Paul, I. D. *A Review of DFSS: Methodology, Implementation and Future Research*. Statement.
[4] Pyzdek, T., & Keller, P. A. (2003). *The six sigma handbook* (Vol. 486). New York, NY: McGraw-Hill.
[5] Šenk, M., Metlikovič, P., Maletič, M., & Gomišček, B. (2010). *Development of New Product/Process Development Procedure for SMEs*. *Organizacija*, *43*(2), 76-86.
[6] Shahin, A. (2008). *Design for Six Sigma (DFSS): lessons learned*

from world-class companies. International Journal of Six Sigma and Competitive Advantage, 4(1), 48-59.
[7] Shen, H., Wall, B., Zaremba, M., Chen, Y., & Browne, J. (2004). *Integration of business modelling methods for enterprise information system analysis and user requirements gathering. Computers in Industry, 54*(3), 307-323.
[8] Tom, M. Y. (2007). *Using Dfss to Develop a Pilot-Scalep Rotein Extraction and Concentration Process (Doctoral dissertation, San José State University*). Unpublished.
[9] Yang, K., & El-Haik, B. S. (2003). Design *for six sigma* (pp. 184-186). New York: McGraw-Hill.

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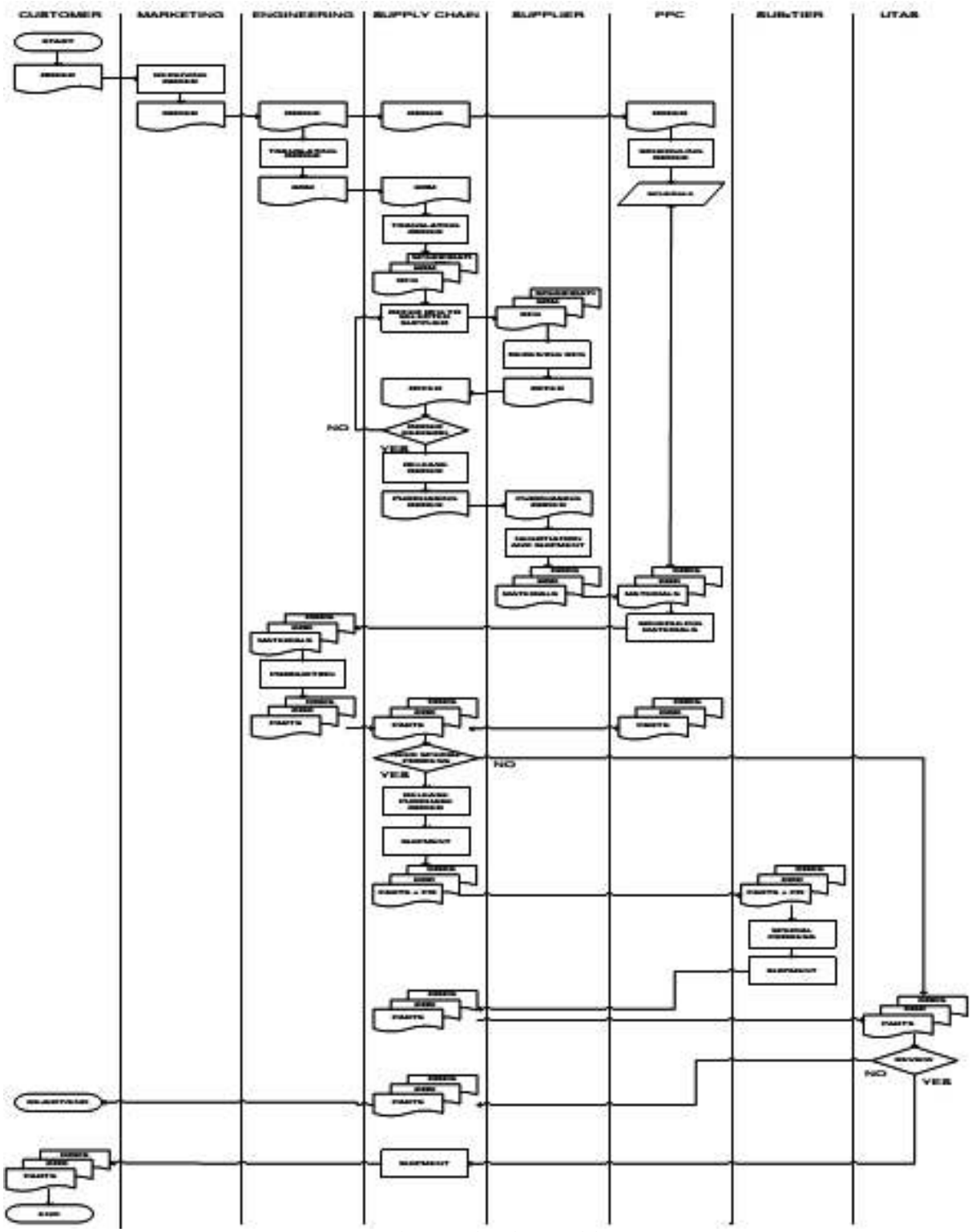

Figure 2. Flowchart Model

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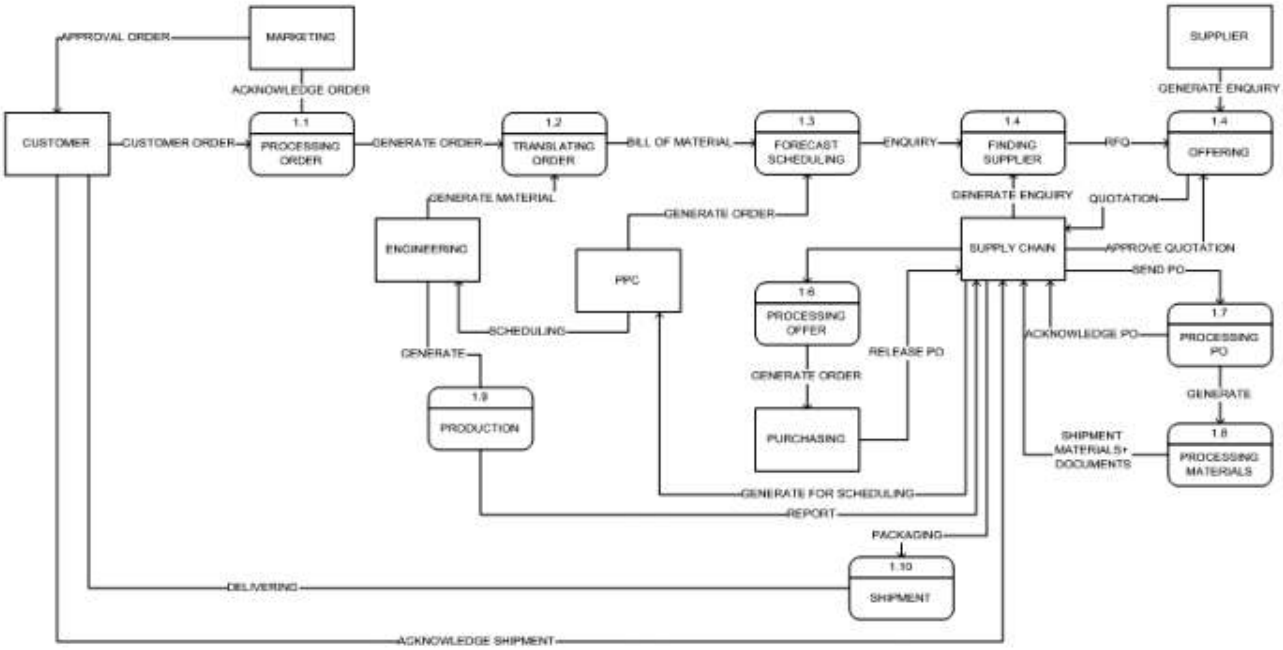

Figure 3. DFD Model

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