

Production Process of Traditional Ship in Bintan-Indonesia

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ABSTRACT

Indonesia is the world's largest archipelagic country in the world, demand for marine transportation is very important. Marine transport being very strategic because it plays a role in connecting one island to another island and marine transport is a tool for economic activity. Global industrialisation causes traditional shipyard less competitive, causing reduction in the number of traditional ships, which are urgently needed to support economic activity. Proper production management planning at the shipyard is expected to help improve the quality of traditional shipbuilding for competitive. This paper discusses current issues of traditional shipyards in Kepulauan Riau-Indonesia and implementation of IDEF models as tool for solving the problem by taking the following factors into account: concept design, perform preliminary design, contract design, detail design and building of ships.

KEY WORDS: *Traditional Ship; Production Planning; Wooden Shipbuilders.*

1.0 INTRODUCTION

Indonesia is the world's largest archipelagic country with more than 17,504 islands the number of pieces, a long coastline more than 81,000 km and 2/3 of the entire region is water. Under this

geographical condition, the role of sea transport for Indonesia is very strategic and vital especially as a trigger for economic development.

Ships is being very strategic because it plays a role in connecting one island to another island that economic activity can be run properly. Ships play a role in stimulating economic growth in underdeveloped areas and as a means of supporting the economy the growing area. Thus the important on ships to play a role in providing shipping freight accessibility is essential, and irreplaceable to fulfill basic necessities society the role of maritime transport depends on the quality of ships operating as well as the number of ships that used to cover broad Indonesia country consisting of many islands. Good quality of shipbuilders is essential to provide good quality of the ships. Traditional shipbuilders empowerment existed in Indonesia should be developed, because, the empowerment of traditional shipbuilders will help the society who depends on marine resources such as fisherman. This will improve the quality and performance for chancing fish, indirectly helps for increasing the government income.

This paper discusses the current problem of traditional shipbuilders in Kepulauan Riau-Indonesia, and then analyze using IDEF model. As case study, the research carried out by visiting three wooden shipbuilders as follows: Kijang-Bintan Island, Kelong island and Mana island in Kepulauan Riau, Indonesia as shown in Fig.1. All information and data are collected through interview and documentation.



Figure.1: Three traditional shipyards visited in Kepulauan Riau Province, Indonesia.

2.0 TYPICAL TRADITIONAL SHIPBUILDERS IN INDONESIA

Based on the function of traditional shipyard in Indonesia, traditional ship yard divided into several classifications: wooden shipbuilding, oriented, building fishing vessels, wooden shipbuilding, oriented, building passenger ships and wooden shipbuilding, building a dry cargo ship

2.1 Traditional shipbuilding layout

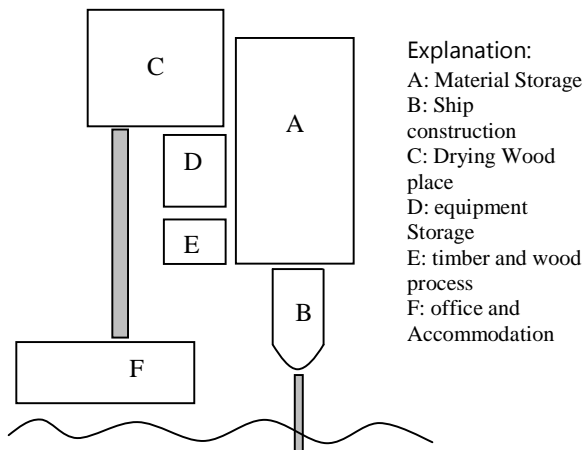


Figure.2: Typical traditional shipbuilder layout in Kepulauan Riau, Indonesia.

2.2 Problem in Indonesia Traditional shipbuilding

| Description | Problem |
|--------------------|---|
| Concept Design | Does not have a concept, the ship is built only based on experience. Do not have a data base of ship Just have a template to make concept on shipbuilding process |
| Preliminary Design | Lack of development of the concept The design is monotonous, less innovative |
| Contract Design | Do not have a market Less support from Government The contract just from owner There is no tender |
| Detail Design | There is no drawing such as lines plan There is no layout Manual calculation based on experience There is no use CAD (Computer Aided Design) method |
| Productivity | Less Innovation to development the ship Limited to produce big ship No technological deepening of ship production process |
| Labour | Their expertise based on experience There is no deepest knowledge |
| Equipment | Less equipment, and traditional Shipyards are still modest Working with manual instrument Most of the work carried out manually Lack of technology Small Machineries |
| Management | There is no management procedure There is no cost management features Product monitoring functionality not observed There is no management to manage material process Poor production management method |

Figure 3. Traditional shipbuilding condition

3.0 IDEF MODEL CONCEPT FOR TRADITIONAL SHIPBUILDING

According to Karaszewski Zbigniew J (1991), IDEF methodology is used to gain an understanding of the present condition of the system being scrutinized. This understanding is achieved through the creation of a structured functional model that identifies activities and how they relate to one another.

The arrows entering and leaving the boxes on the left and right represents inputs and outputs, respectively. Inputs represent elements that are needed to perform the function. Outputs show the data that is produced as a result of the function. The function transforms the inputs into the outputs.

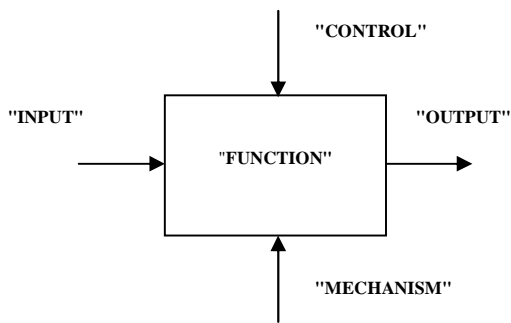


Figure.4: General element IDEF modeling approach

Arrows which enter from the top indicate controls, or things which constrain or govern the function. Arrows entering the bottom of the boxes are mechanisms. Mechanisms can be thought of as the person or device which performs the function.

IDEF models to describe the traditional process on Shipbuilding in detailing the different functions at every level. Every function will be discussed in detail and comments that support the existence and structure of each function that has been provided.

3.1 Concept Design Improvement

At the design concept of traditional shipbuilding in Indonesia, the customer plays an important role in making decisions on ships design concepts. Most of the major decisions on the proposed customer who is technical information about the parameters of the desired ships, the most important dimension is the principle and function of ships to be built.

In the design concept phase, the traditional shipbuilders should achieve performance requirement from the owner and society by taking into account the following factors such as: customer objectives and technical information. The shipbuilders require improve qualification of staffs, database system, facilities and equipments.

The factors should be controlled under in which forecast the start of a design which is a technical feasibility study to establish the traditional ship that aims to fulfill the desired requirements, so that ships are built to have the appropriate criteria to be operated, as required ships speed, type of wood material used, etc.

The traditional ship yard has a budget problem due less the loan provided by the other party.

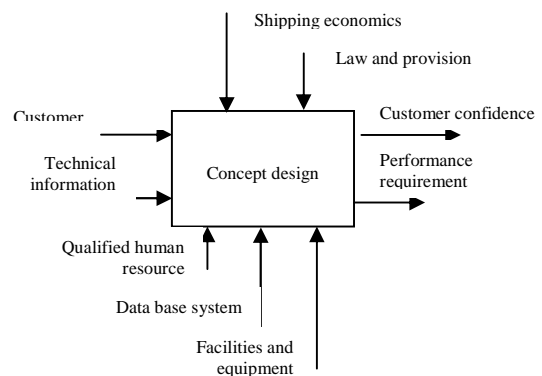


Figure.5: IDEF diagram concept design in Indonesia traditional shipbuilding

3.2 Perform Preliminary Design

Preliminary design involves the development and refinement of the principal characteristics of a ship with greater precision than that required during the concept design stage. These characteristics include principal ship dimensions, selection of material such as wooden and timber, determination of the size and type of propulsion plant. This design solution must continue to satisfy customer requirements such as capacity, service speed, etc. Other things to be considered in the preliminary design are reviewing a concept design package to verify that the requirements have been appropriate. Traditional shipbuilding in preliminary designs has to conduct drawing such ship line.

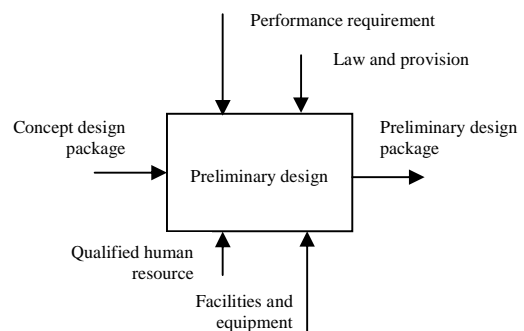


Figure.6: IDEF diagram preliminary design in Indonesia traditional shipbuilding

3.3 Contract Design

Contract design which is performed in traditional designs shipbuilding, is a contract between the customer and shipbuilder, rarely there is the addition of other parties that support the ship construction. No tender is performed. The design contract agreement is just approved by the customer with the shipyard.

As the existing traditional ship construction contract is carried out only by morality, rules and regulation rare aspect is necessary to be added to the design contract.

The importance of regulation and rules in the traditional shipbuilding aims to improve the productivity of traditional Shipbuilding. Government support is required to construct a

traditional ship, performed by providing a rule as a basis of cooperation and partnership in the traditional ship building.

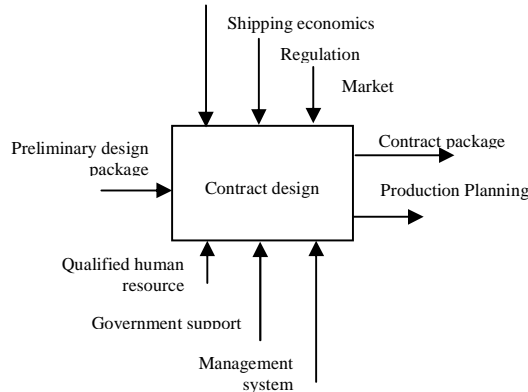


Figure.7: IDEF diagram contract design in Indonesia traditional shipbuilding

3.4 Detail Design

Detail design to plan activities that will be conducted in a traditional ship building. As for the activities undertaken during detail design are the drawing - ship lines, material specification, information for plan and specification, construct the traditional ship information

Problems that arise in traditional Shipbuilding in Indonesia, one of which is construct the ship, not based on the lines plan, but mostly do not use a drawing. Drawing is very important for a traditional ship building to be developed. Drawing serves as a data base, drawing plays an important role in the improvement and the performance of Shipbuilding with a drawing, it is expected that customers can trust performed Shipbuilding performance in building ships.

All of work performed in the traditional shipyard in Indonesia, is a manual method. A simple computational method in the traditional shipyard in Indonesia is to help in maximizing work time, include simple computational methods that can help traditional ship yards are make a drawing, support calculation, make a simple management system.

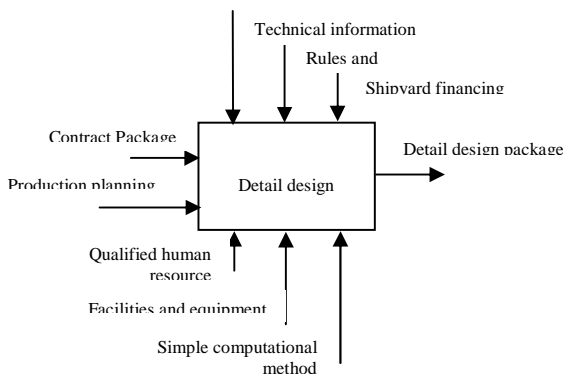


Figure.8: IDEF diagram detail design in Indonesia traditional shipbuilding

3.5 Build a ship

The last stage in the traditional construct a ship is building a ship. The stage is performed by looking at the detail design has been implemented. Databases must address satisfying in building ships quality traditionally relied heavily on human resource and expertise of labor, because the tendency of traditional shipbuilding in Indonesia is based on the manual worker, not much assistance in machine. Labor skills possessed a very important role in the quality of the ship will be built.

Availability of facilities and good management system enables the construct in a traditional ship building. Delay in material is often faced by a traditional ship yard due to lack of government support in helping to develop the traditional shipyard, large tax, minimal regulation, sabotage by a large shipbuilding industry is still hit by the problems of traditional ship building

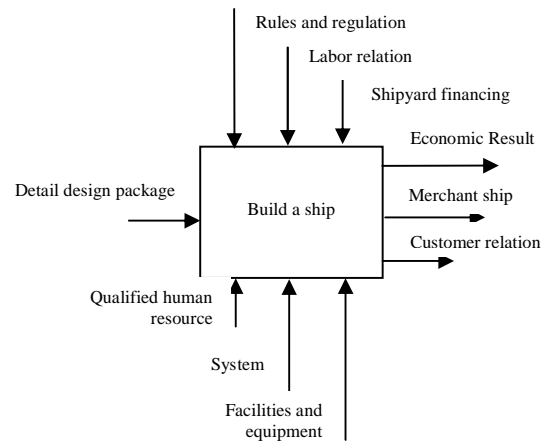


Figure.9: IDEF diagram construction a ship in Indonesia traditional shipbuilding

CONCLUSIONS

Traditional wooden shipbuilding in Indonesia should be taken to consider the sustainability. Traditional wooden shipbuilding is an important tool in helping a small community, to get on board, which serves to assist in activities of daily living. Traditional wooden shipbuilding also plays an important role in helping the community in making ship and repair ship

Problems arise now in traditional shipyard is less competitive. The modern shipyard which produce steel from ship and fiber more pressing the traditional shipyard, so that the wooden shipbuilding less desirable.

To increase the productivity of traditional wooden shipbuilding, it is required some planning improvement in terms of production, including the addition of drawing lines plan, because the drawing is very important.

Improvement in terms of management systems and good management procedures, and quality can help keep sustainable wooden shipbuilding.

Support from government is very desirable for small businesses such as traditional shipbuilding. Government plays an important role for giving out easy for small businesses to grow. Reducing the tax is also one of the government supports for small businesses

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