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New business opportunity: Green field project with new technology

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ABSTRACT: *Since 2009 of global financial crisis, shipbuilding industry has undergone hard times seriously. After such a long depression, the latest global shipping market index shows that the economic recovery of global shipbuilding market is underway. Especially, nations with enormous resources are going to increase their productivity or expanding their shipyards to accommodate a large amount of orders expected in the near future. However, few commercial projects have been carried out for the practical shipyard layout designs even though those can be good commercial opportunities for shipbuilding engineers. Shipbuilding starts with a shipyard construction with a large scale investment initially. Shipyard design and the equipment layout problem, which is directly linked to the productivity of ship production, is an important issue in the production planning of mass production of ships. In many cases, shipbuilding yard design has relied on the experience of the internal engineer, resulting in sporadic and poorly organized processes. Consequently, economic losses and the trial and error involved in such a design process are inevitable problems. The starting point of shipyard construction is to design a shipyard layout. Four kinds of engineering parts required for the shipyard layout design and construction. Those are civil engineering, building engineering, utility engineering and production layout engineering. Among these parts, production layout engineering is most important because its result is used as a foundation of the other engineering parts, and also, determines the shipyard capacity in the shipyard lifecycle. In this paper, the background of shipbuilding industry is explained in terms of engineering works for the recognition of the macro trend. Nextly, preliminary design methods and related case study is introduced briefly by referencing the previous research. Lastly, the designed work of layout design is validated using the computer simulation technology.*

KEY WORDS: Shipbuilding industry trend; Shipyard; Layout; Simulation.

INTRODUCTION

Background

This paper intend a commercial perspective of the shipbuilding industry rather that the theoretical research. One cycle of complete layout design work was already conducted and introduced by same working group of this paper (Song and Woo, 2013).

Before taking up the main subject, mentioning about the current global shipbuilding industry is required for the perceiving of the business opportunity. For several decades, Asian nations such as Korea, Japan have been leading shipbuilding industry after declined in Europe and America. However, several developing countries such as China, India, Brazil

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are going to make an entrance onto the shipbuilding industry by themselves after financial crisis of 2009. These developing countries are finding a technical partner or information supplier because they have little knowledge and man-power by their own.

Weight shift of shipbuilding industry is shown in Table 1 and Fig. 1. Today, center of weight is being passed over to the China and other developing countries. Through the investigation of this trend, it is inevitable that central movement of shipbuilding as a manufacturing industry from Korea and Japan to China and the other countries. So, domestic shipbuilding Industries have to excavate and cultivated new business models in order to keep the shipbuilding competitiveness from the lesson of European ship engineering companies, those still have competitiveness in core technology of ship such as a design capability of high value product and a special equipment loaded in ship or offshore structure. They are maintaining those key technologies by patent barrier. Noticeable example is that domestic shipbuilding companies should pay patent fee (5% of the vessel price) to the engineering company of France that own the patent of core cargo containment system of LNG vessel.

Meanwhile, the competitiveness of domestic shipbuilding technology, let's have a look at the current status of domestic shipbuilding companies and research institutes, is mainly located on the ship production and the shipbuilding management technology. In fact, several domestic shipbuilding companies such as SHI (Samsung Heavy Industry) and DSME (Daewoo Shipbuilding and Marine Engineering) already have entered the export business of shipbuilding IP (Intellectual Property) as shown in Table 2. Several cases are sales of enterprise asset such as ship design, production method, enterprise organization, etc. before 2009. And very currently, the new business model is being evolved to the engineering service including IT since 2009. This movement strengthens value creation business area of shipbuilding engineering consulting and services. As a part of these trends, several domestic engineering companies are trying to advance into the green-field project (developing a new shipyard from the bottom) and the improvement project of current shipyard. Engineering service about shipyard layout design has a great ripple effect in that the accompanying projects such as a ship design system, a shipbuilding management system, a shipyard operation system, etc. can be obtained.

In this paper, several previous researches will be reviewed. And, the layout design procedure will be introduced with a case study. Lastly, the validation by simulation will be introduced.

Table 1 Weight shift of shipbuilding industry.

Nation	1940s	1950s	1960s~1980s	1990s~2000s	2000s~
British/ America	New production method (Rivet assembly) Competitive price	Product diversity Non-price competitive	Governmental subsidy Nationalization/ Closing	Privatization Reduction & Disposal	
Europe		Governmental support	Product specialization Company restructuring	Governmental subsidy Bankruptcy/ Closing	
Japan		Governmental support New production method (Welding assembly)	Governmental support	Product diversity Non-price competitiveness	
Korea			Governmental support	Competitive price	Non-price competitiveness Product Differentiation (High value vessel)
China/India/South America etc.				Governmental support	Competitive price