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An American Perspective on Japanese Shipbuilding Competitiveness

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日本は約半世紀にわたり商船分野での造船事業における世界市場のリーダーの地位を保ってきている。一方，米国は艦艇分野において顕著な建造実績を有するものの，世界の外航船建造におけるシェアは無視できる程度であり，国内輸送のための船舶を国の保護のもとに建造しているに過ぎない。そのような現状を踏まえると，本論文で個別の造船技術について日本の競争力を論じたとしてもさほど意味あるものとはならない。しかし，長期的な産業競争力の維持・強化という面においては，アメリカ的視点からの経営的考察には何らかのご関心をお持ち頂けるのでないかと思われる。本論文は長期的な産業競争力の維持・強化に不可欠なイノベーションを実現して行くための方策について，事例を踏まえながら経営的側面から論ずる。現在，いくつかの先進的なアメリカの企業は“知”の面での高度な国際化を実現することにより新たな競争力強化を実現しつつあると考えられる。将来に向けて日本の造船業の国際競争力は，この“知的国際化（intellectual internationalism）”という新たな段階に移行することにより強化されるものと考えられる。

Introduction

For this paper we have been asked to discuss Japanese shipbuilding competitiveness from an American perspective. This is an unusual writing assignment indeed. Needless to say, people in the American shipbuilding community have a deep admiration for the achievements of the Japanese industry. We would hardly presume to offer advice. However, certain things that occur to an American mind may be of interest in Japan. We will offer some thoughts that perhaps will provoke some discussion in offices and production shops in Japanese shipyards.

The shipbuilders of Japan have been global industry leaders for nearly four decades. From the 1950s to the 1970s, Japanese shipyards (and certain western European yards) led the way in the rise of the new, post-war shipbuilding industry in which opportunities for notable advances in product and processes fostered a high-growth, profitable global business with a dynamic, innovative spirit. This era climaxed in a shipbuilding 'bubble' in the early- to mid-1970s that burst when demand for new construction suddenly dried up due to world-wide economic shocks. At the same time, the South Korean shipbuilding industry was being established. After an initial start-up period South Korean shipbuilding capacity grew rapidly, thus confronting Japanese shipbuilders with new and determined competition.

Today, the Japanese and South Korean shipbuilding industries are direct competitors. In terms of corporate structure, design and production technologies, shipyard facilities and layout, and market strategy, the major Japanese shipbuilders do not differ fundamentally from their South Korean counterparts. In the absence of large differences in any of these areas, it is becoming ever more difficult for Japanese shipbuilders to maintain product differentiation. Without product differentiation, competitive advantage becomes based primarily on price. While Japanese shipbuilders remain highly competitive today, Japan's long-term prospects in the business, to many, are unclear.

Japan is currently suffering a crisis of morale across its manufacturing industries and shipbuilding is not an exception. As it was put recently,

'Our manufacturing industry seems to have lost self-confidence despite the fact that the fundamentals of Japan are good ; its technology is leading the world, citizens are wealthy, and daily necessities are abundant.'[1]

It is sometimes thought that shipbuilding is an

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[1] Uenohara 2002.

industry suited to only one stage of economic development. After that stage has passed, shipbuilding is relocated to a nation lower on the developmental scale. More than thirty years ago, many people in Japan already regarded shipbuilding as passé.[2] Was this a correct analysis? Would it be correct today? We have discussed this issue elsewhere, without being able to draw a definite conclusion as to the general future prospects of the shipbuilding industry in affluent countries.[3] In other words, the future is uncertain.

Japan's major shipbuilders are divisions of large conglomerate companies. For this paper, our viewpoint is that of a shipbuilding manager, not an executive at a diversified, multi-business corporation. Our question is not, 'Should XYZ Inc. exit the shipbuilding industry in favor of better business opportunities elsewhere?' This may be a valid question, but it is a question that we are not asking here. Instead, we begin with the premise that we are in shipbuilding, in Japan. The issue is how to better position our Japanese shipbuilding operations for long-term global competitiveness.

It seems clear that the future of shipbuilding in Japan will depend on :

(1) Implementing highly efficient production systems based on new technologies, and
(2) Pioneering high value added markets.

We believe that results in both of these areas are required. Concentrating in either one alone is not likely to secure the long-term future of the industry. We have, then, a two-pronged business strategy.

The first requirement (highly efficient production) has not been a problem in Japan. Since the 1950s, the Japanese shipbuilding industry has been adept at developing and exploiting new, cost-efficient production technologies. Such accomplishments are frequently described in *Techno Marine ;* we have discussed this in a forthcoming paper.[4]

The second requirement, (pioneering high value markets) is a different matter. To succeed in pioneering takes a special talent ; an ability to envision innovation based on big ideas. In this respect, the ability of Japanese shipbuilders is not so clear. This is recognized in Japan and it is the root cause of the crisis of morale in Japanese shipbuilding.

America's role in the post-war development of Japanese shipbuilding

America's attitude and approach to shipbuilding has been very different from Japan's. The basic motivation for maintaining a shipbuilding industry in the United States is national security. International commercial competitiveness in large ocean-going ship construction has not been maintained during any sustained period since the sailing ship era.

Commercially competitive or not, American shipbuilders have in the past demonstrated a unique ability to think beyond the traditional boundaries of the shipbuilding industry, and to implement original approaches to shipbuilding. This kind of creative thinking was most famously applied in the emergency shipbuilding program of World War II. Huge numbers of ships were built at specially designed facilities. These emergency shipyards were quickly constructed at various sites around the nation. Production processes were *not* modeled after the world's most commercially competitive shipyards (British), but instead were inspired by a different industry in which U.S. companies were the innovators and leaders—automobile mass production.[5] The program was a phenomenal success.

After the war, the emergency shipyards were dismantled and none remain today. However, American experience and know-how were combined with a vision of future patterns of world trade, to form the basis for the initial development of the post-war Japanese shipbuilding industry. How this happened is perhaps not well known in Japan. The idea was the brainchild of Daniel Ludwig. Ludwig was not a naval architect ; his formal education had ended with the eighth grade. However, he was a legendary American business visionary and he was able to conceptualize and implement key innovations in international shipping and shipbuilding.

After the war, Ludwig predicted big changes in oil industry logistics. He foresaw that increased future

[2] Kahn 1970, p 91.

[3] Koenig and Narita 2001.

[4] Koenig et al 2003b.

[5] Lane 2001. See, for example, p. 206 : '… the emergency yards were not engaged in shipbuilding in the old sense, they were an assembly operation.'

demand for Middle East oil would result in a need for economical transport using very large oil tankers. In order to be the leader in this development, he needed a suitable shipyard. After surveying the world, Elmer Hahn (head of Ludwig's Norfolk, Virginia shipbuilding operations) concluded that the former Imperial Navy dockyard at Kure would be the right place.

From August 1951 to December 1962, Ludwig's company, National Bulk Carriers (NBC), leased the former Imperial Navy dockyard at Kure. As the yard was owned by the Japanese government, certain conditions were specified, among which was that Japanese shipbuilders and engineers from other companies would be allowed complete access to the NBC Kure facility and could study any aspect of its production process.[6] NBC was a shipping company and its concern was to obtain ships for its own use rather than building them for others, therefore this condition was not a problem for the Americans.

It was later written,

'NBC's Kure shipyard quickly became acknowledged as the leader in the diffusion of the new technology and as the originator of a fresh system for Japanese shipbuilders. The importance of the latter cannot be overemphasized. It reflects the far-sighted wisdom of the Japanese Government at the time who, by facilitating the agreement, enabled a prototype for all new shipyards to be demonstrated.'[7]

As a senior manager at IHI later remarked,

'The history of Japanese modern shipbuilding technology began when National Bulk Carriers, Inc. (NBC), a U.S. corporation, leased the former naval dockyard in Kure after World War II. NBC brought to Japan the block construction method and the welding technology which made block construction possible, that is, the most modern American rationalization of shipbuilding that then existed. Dr. H. Shinto, who had worked as the chief engineer under Mr. E. L. Hann (the NBC team leader), systematized all the new elements so as to contribute to the development of the Japanese shipbuilding industry as it now exists.'[8]

While Ludwig's team of Japanese and American shipbuilders was ramping up production at Kure, the U.S. wartime shipyards were being dismantled and the world's leading shipbuilding nation (Great Britain) remained reliant on craft-style production concepts.[9] Great Britain failed to innovate and by 1956 ceded market leadership to Japan.

Is Japan overly focused on cost reduction?

The Kure shipyard case study shows a complete, two-pronged strategy that achieved now-legendary success : NBC Kure focused on production technology development (hull block construction, etc.) *and* it pioneered new, innovative, growth markets (the supertanker). A perfect strategy, based on a big idea backed up by solid implementation.

In recent years, however, Japanese shipbuilding companies have become noted more for high quality, cost-efficient production than for strategic vision and product innovation. Generally, Japanese manufacturers are masters at competing on operational effectiveness ; that is by improving quality and lowering costs. However, in some cases Japanese firms no longer have the decisive operational edge they once enjoyed. Foreign competitors may be able to catch up. As a U.S./Japanese team of management scholars has remarked, the lack of variety in Japanese business strategies leads to competition based on operational effectiveness alone and this is dangerous from the long-term perspective :

"The Japanese approach to competing not only eliminates differences between competitors but also undermines the entire industry. Competition gravitates to price, power shifts to the buyer, and homogenization lowers the barriers to entry both in Japan and for me-too Asian rivals…. Continuous incremental improvement is not strategy."[10]

New ideas for competing are needed to get out of this strategic dead-end. Can an American perspective be of

[6] ASME 1992, Chirillo and Chirillo 1985, Davies 1992, Chida and Davies 1990.

[7] Chida and Davies 1990, p. 112.

[8] Sasaki 1988, p. 104.

[9] Lorenz 1991.

[10] Porter et al 2000, p. 82.

value? American firms are popularly known for almost the opposite set of talents as the Japanese. (*Which should make them ideal strategic partners.*) U.S. companies eagerly conceive and implement innovative business strategies. The result is that within an industry, there is a much greater diversity of strategies in America than in Japan.

The American manufacturing experience shows that the invention of a new business concept *does not require* the invention of a whole new industry. So-called 'frontier' industries are not always needed ; frontier concepts for existing industries will do just fine. Dell Computer, for instance, is a global manufacturer run by a chief executive (Michael Dell, approx. 38 years old) who conceived a manufacturing and sales strategy very different from IBM, Apple, and other top PC makers. Last year, in a tough market, Dell's net income was $1.2 billion on sales of $31 billion.[11] Today, even Toyota studies Dell's operations.[12]

Pioneering high value added markets

Here are just a few examples of significant shipbuilding market innovations :

- Supertanker
- Containership
- Pure car carrier
- LNG carrier
- SWATH
- FPSO

In these cases, Japan contributed valuable technical development. However, the basic idea originated elsewhere. Why?

The biggest product innovations in shipbuilding are the result of bold new ideas for world trade, logistics, transportation, regional economic development, and so forth. Originating ideas at this level does not always require advanced education but it does sometimes require a creative feel for future directions in economics and society. Many of the big ideas have been originated not by product development teams, but by independent, entrepreneurial shipowners. We have seen above how the supertanker was first conceptualized by Daniel Ludwig.

The other major shipping innovation of the 20th century was the containership. This was invented by another visionary American shipowner, Malcolm McLean. McLean was the son of a North Carolina farmer and his first independent business was owning and driving a second-hand truck. He got the idea for containerization one day while waiting in line, sitting in his truck, waiting for stevedores to unload his truck and put his cargo on a ship. Many years later, in 1955, he sold his trucking business for a substantial sum and set about inventing container shipping. On April 26, 1956, the world's first containership, a converted tanker called the *Ideal X*, sailed from Port Newark, New Jersey. McLean's company, Sea-Land, was the pioneer of "the greatest advance in packaging since the paper bag."[13]

The Japanese shipbuilders' future will best be secured if they can figure out a way to become leaders in the generation of new ideas and technical innovation. We propose that one way to achieve a more innovative spirit would be to become more truly international.

What is an 'international' enterprise?

Hypothesis : Shipbuilding is an international business. Maintaining future competitiveness in an international competitive environment will require a more international approach to people and ideas.

Worldwide sourcing of technology, ideas, and leadership is a comparatively new idea and is not often implemented. We will discuss this in terms of four stages of internationalization (Table 1). These four stages are not part of any recognized theory of economic development, but we find them useful for the purpose at hand.

Stage 1 : Isolation. During the Tokugawa Shogunate, Japan was situated at Stage 1. The nation maintained what it regarded as a sufficient level of business performance in nearly total isolation. Shipbuilding was done exclusively for domestic coastal trading.

Stage 2 : Export orientation. Since the end of the Second World War, the Japanese government has used industrial policy to shape the nation's industries into competitive exporters. The term 'industrial policy' covers a variety of regulatory and promotional actions taken by a government, most often to encourage manufacturing industries— 'During the 1950s and 1960s, targeted

[11] Dell Computer Corp., 2002.

[12] Jones 2003.

[13] *Economist* 2001.

Table 1. Stages of enterprise internationalization—for discussion

1. Isolation
2. Export orientation
3. Global operations
4. Global companies

industries received favorable allocations of foreign exchange and subsidized loans through government agencies. The main purpose of industrial policy in those years was to identify 'sunrise' industries and nurture them quickly.'[14] During a period of economic development, studying the development paths of the more advanced manufacturing nations could identify target industries that Japan should move into.

In its heyday, Japan's legendary Ministry of International Trade and Industry was world-renowned for its expert guidance of Japanese manufacturing industries as they rose to global export prominence.[15] The Ministry of Transport led shipbuilding industrial policy.

Japanese concentration on building domestically for global sales, has worked in the past. It has led to phenomenal success in steel, shipbuilding, automobile manufacturing, and other manufacturing industries. But in some manufacturing sectors, Japan's leading companies have moved on to the next stage.

Stage 3 : Global operations. The next step is global operations. The company is not only selling abroad, it is performing many other functions in overseas locations as determined by the needs of global competitiveness. Forces that lead to this stage include overseas market needs, trade restrictions, and opportunities to reduce labor costs. This stage represents a significant increase in the internationalism of the firm's thinking. However, exposure to foreign ideas and concepts is still limited. This is because foreign employees (1) remain low- to mid-grade within the company's management hierarchy, and (2) are mostly employed locally in their own home country ; they are seldom promoted to positions of influence at the head office.

Stage 3 companies with global operations are exposed to certain types of new ideas and business concepts that originate overseas. But in its heart the company remains domestic. Its leadership and therefore its basic ways of thinking remain domestic.

Many Japanese manufacturers have progressed only to this stage so far.

Stage 4 : Global companies. Today, there are some manufacturers that have attained the next level of internationalization : Actually *being* international. Rather than restricting themselves to domestic sourcing of people and ideas, these companies attract top individuals from a worldwide talent pool. Researchers, designers, strategic thinkers, even chairmen and CEO's are sought with small regard for geographic origin.

Major League baseball teams are good examples of Stage 4 global companies. Major League baseball teams are based in the United States and Canada. However, their players are sourced worldwide and represent the highest level of global baseball talent.

U.S. automobile manufacturers have recently advanced to Stage 4. The Detroit automakers have had global sales and manufacturing operations since the 1920s. Before the Second World War, Ford and General Motors even operated automobile assembly plants in Japan.[16] However, despite their worldwide sales, design, and manufacturing, the Detroit automakers were well known for their parochial midwestern mind-set. They often seemed ignorant of ideas and market developments in California, let alone overseas. They were classic Stage 3 companies. Their operations spanned the entire free world, but their culture was domestic.

Recently the situation has changed dramatically. In 1993, Alex Trotman became the head of Ford Motor Company. Trotman was foreign-born, an Englishman who had worked for Ford in Europe and Australia before moving to the Detroit head office. It was observed that,

"Trotman represented Detroit's realization that the American auto industry was part of a globe-spanning enterprise. No longer would GM, Ford, or Chrysler be led solely by people whose world view was limited to the American Midwest."[17]

Today, U.S.-based automobile manufacturers are facing some very big problems. Will they be able to survive? No one can say. But lack of Stage 4 inter-

[14] Ito 1992, pp. 67–68.

[15] Johnson 1982.

[16] Wilkins 1990, pp. 42–50.

[17] Ingrassia and White 1994, p. 389.

nationalism is no longer one of their weaknesses.

Implications? The Japanese shipbuilding industry remains for the most part at Stage 2, with domestic operations building competitively for worldwide sales. There are some exceptions, such as Kawasaki, which has a joint-venture shipyard in China and has thus started to enter Stage 3 (global operations).[18] But as we have seen from the example of the U.S. auto industry, intellectual cross-pollination leading to new perspectives on competitive strategy does not really happen until Stage 4 is reached.

To date, very few firms have reached Stage 4 (operational and intellectual internationalism). Few (if any) Japanese companies are among them. Lack of intellectual cross-pollination results in many Japanese companies pursuing nearly identical strategies.

A group of similar people, from similar educational backgrounds, reading the same newspapers and journals, will have a hard time competing creatively with a free-ranging, internationally diverse team. As Porter and his Japanese colleagues put it,

"… Japanese executives often rely on the same sources of information about markets and industries … the result is that executives from different companies often share the same view of the future and will therefore pursue similar actions."[19]

Discussion

Shipbuilding viability in high-cost countries is dependent on an ability to implement a two-pronged strategy of (1) Implementing highly efficient production systems based on new technologies, and (2) pioneering high value added markets. Both points must be successfully addressed, otherwise the Japanese shipbuilding industry is destined to decline.

Japanese shipbuilders lead the way in operational effectiveness. Their ability to deliver a cost effective, high quality product is second to none. Productivity continues to improve fast[20] so the competitive outlook in the short- to mid-term is not so unfavorable as Japanese production methods present a 'moving target' to catch-up countries.

Given that there is no upcoming short-term competitive crisis, now is a good time to undertake a strategic self-examination. A compelling vision of innovation in high value products is needed to avoid a future dependent on exclusively cost-based competition. Without a new vision, the industry will suffer a continuing crisis of morale.

There are some ongoing projects that may provide a short-term boost to Japanese shipbuilding. Some see opportunities for new products such as fast passenger ferries, large floating structures, and so forth. These programs may be worthwhile.

However, we think that these present initiatives are simply not enough. We recommend a more ambitious vision. Moving to Stage 4 of internationalism will provoke new ways of thinking, thus unleashing Japanese shipbuilders' ability to make the kind of innovations that will ensure the long-run future of the industry.

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[18] Nikkei Weekly 2003.

[19] Porter et al 2000, p. 164.

[20] Koenig et al 2003a.

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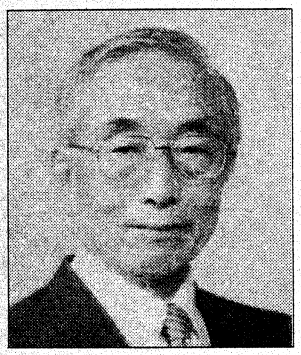

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