

Competitive Power of Japanese Digital Consumer Electronics

By *Norio GOMI*

Who Are the Rivals? Competition on Two Fronts: Products & Parts/Intellectual Property

Global competition in the electrical appliance industry was centered on rivalry among Japan, the United States and Europe through the latter half of the 20th century. But the structure of the competition is rapidly changing in the current century. Not many companies in the industrialized countries deserve being called an integrated digital consumer electronics manufacturer. In the United States, GE, which was once an integrated electrical appliance maker, and IBM, which transformed itself from a manufacturer of mainframe computers into a hardware/software solutions provider, can be defined as such. But Motorola, Hewlett-Packard, Intel, Microsoft and Dell either focus on specific products or deal in a limited number of specified business lines. The situation is more or less the same in Europe. Siemens, Philips and, arguably, Thomson may be called an integrated manufacturer. But Alcatel-Lucent, Ericsson and Nokia are essentially specialist-type enterprises. There are several such companies in the United States. Prominent among them are the start-up IT businesses in Silicon Valley that are

engaged in horizontal division of work (*Chart 1*). In Asia, South Korea's Samsung Electronics and LG Electronics have made big strides after trailing in the footsteps of Japanese forerunners. Taiwan's Acer, also hailing from Silicon Valley, is another specialist with a high competitive edge. Several foundry businesses that play a big role in the IT industry have been growing fast in Taiwan. Outstanding in China are Haier, TCL and Lenovo, which has acquired IBM's personal computer unit. They are aiming to become integrated manufacturers. In the arena of electronics manufacturing service, Taiwan's Hongfai evolves its business mainly in China, overwhelming major Chinese peers in volume terms.

The picture is quite different in the business of components and software. Intel and Advanced Micro Devices virtually monopolize the production of CPUs. Microsoft takes a strong hold on basic operating systems. German business software solutions provider SAP, database software provider Oracle and telecommunications specialist Qualcomm, both of the United States, all hold a great many patents. In fact, a handful of American and European companies monopolize basic patents, collecting a huge amount of royalties from companies that produce and market products based on those

patents. Japanese makers excel at commercializing new products, but many of them routinely pay a lot of royalties to the American and European patent holders. Many manufacturers in South Korea, Taiwan and China that attained their growth on technology transfers from advanced countries in the late 20th century turn out a full range of versatile digital modules and components (*Chart 2*). The simple fact is that the more they produce, the more they pay in royalties. In typical Japanese rhetoric, they stay poor amid a bumper crop. Most makers in developing countries have no choice but to import core high-tech components. For example, South Korea used to suffer a bilateral trade deficit resulting from component imports from Japan. Today, the country's balance of payments is worse off on a global rather than bilateral basis. China is aiming to turn out key components on its own. But it will need to go a long way to reach the goal. In quantitative terms, however, much of the global digital consumer electronics production is being shifted to Asia as *Chart 3* indicates. The bottom line is that European and American enterprises are stepping up their business selection and concentration to put greater emphasis on specialized, high value-added lines. Latest examples of this include GE's sale of its plastics unit to a

Chart 1 Strategic features seen in US IT industry

<ul style="list-style-type: none"> ● Systems to operate Windows-affiliated IT network products: Computer OS, Windows OS, Microsoft ● Applications software: SAPS, Oracle ● CPU: Intel > AMD ● Browser: Internet browsing Internet Explorer > Netscape Navigator ● Router: Internet network architecture CISCO Systems > Bay Networks, 3Com ● Server: Equipment indispensable for information transmission on the Internet HP, Dell ● Personal computer: Price competition led by Asian EMS firms and ODMs HP, Dell, OEMs

Source : Compiled by author

Chart 2 Technology transfers to Asia

	1960s	1970s	1980s	1990s	Future
Japan	radio, taperecorder, monochrome TV	color TV, hi-fi stereo system, refrigerator, washing machine, air-conditioner	VCR, CD player, semiconductor	handheld telephone, PC, LCD	IT products
NIEs			color TV, VCR, air-conditioner, passive Semiconductors	semiconductor, LCD	
ASEAN			CRT TV, refrigerator, air-conditioner, semiconductor	VCR	
China			monochrome TV, radio, transistor	color TV, CD, stereo system, VCR, Video CD, refrigerator, washing machine, air-conditioner	

Source : Compiled by author

Saudi interest and Philips' sale of its North American TV unit to Funai Electric of Japan. In this situation, the next goal for Asian manufacturers is to add to the value of their business. They aim to attain the purpose while playing their present role as the world's production center to meet global demand.

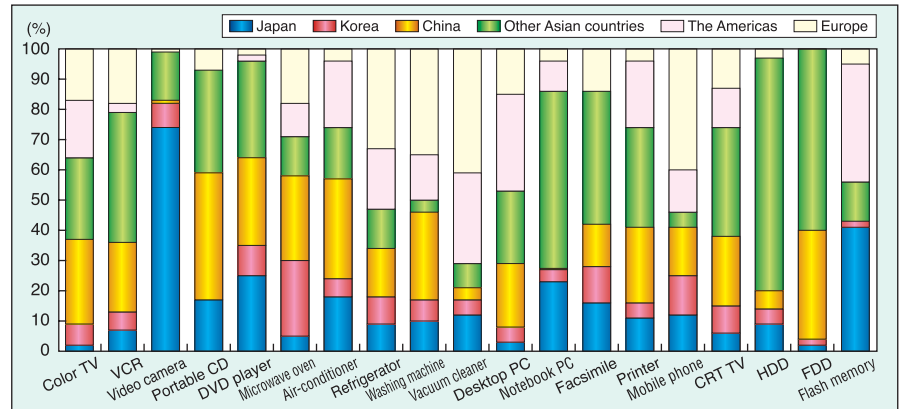
Put another way, the ongoing global competition is being fought on two fronts. Rival manufacturers vie fiercely with each other in the front market for end products. At the same time, they compete with companies engaged in different business lines in the rear market where components, software and intellectual property are at stake.

South Korean and Chinese makers engaged in the foreground competition are keen to take part in the background race as well. In South Korea, the government and businesses are making enormous efforts to develop their own parts and materials industries. This is one of the underlying factors that block progress in the Japan-South Korea talks on a bilateral free trade agreement. China's key policy is to avoid employing foreign advanced technologies wherever possible. It is aiming to develop its own technologies, standardize them at home and turn them into global standards on the back of its huge market. This attempt appears to be based on its new "domestic and global" strategy. Sample cases of such initiatives are seen in the TDS-CDMA 3G mobile telecommunications standard and the DVD format. China, too, is trying to foray into the background race.

Japan's Five Potential Advantages

Japanese manufacturers lie restlessly, wedged between the two races in the fore and rear markets. Against that background, however, there are several factors that can allow them to exert their forte. Japanese companies lag behind their American and European rivals in product planning and technology standardization. But they have an excellent ability to swiftly put those US and European development designs into practice. They have a high-jumping power to stride over the death valley that lies between the development of new technology and its commercialization. They do that quickly and efficiently. This is one of their advan-

Chart 3 Asian market share by product



Source: Fuji Kimera Research Institute

tages. Much of this comes from a closely-knit framework for cooperation that links the development, production, marketing and all other relevant divisions within a company and a well-established product development system that ensures information sharing between the company and its subcontractors.

They draw their second advantage from Japan's highly competitive machinery industry. This industry is structured on five different layers closely linked to each other that generate interindustry technological fusion. Assemblers stand atop the pyramid, followed by components, materials, machining/molding and embedded software specialists who lie over one another. Japan is the main suppliers of many materials and components ranging from thin steel sheet for cars and wafers for semiconductors to plasma/LCD screens and EL devices.

Japan makes big contributions in the area of machine tools and metallic molds. It also plays an important role in the development of embedded software that provides distinctive functions to end products.

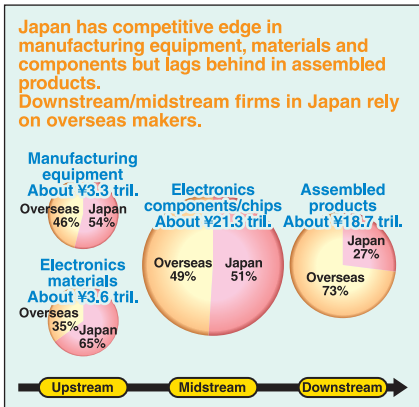
Their third advantage is related to innovations generated through technological fusion that encompasses electronics, optics, microfabrication and precision engineering. Such innovations, for instance, touch off competition in the same business line between electronics and optical equipment manufacturers and often lead to the development of new products.

As their fourth advantage, I may refer to the process innovation that the technological fusion has brought on top of product

innovation. A chip that has broken through the 40 nm barrier in the front-end process is about to be mass-produced in Japan. Japanese makers have an overwhelming edge in manufacturing equipment to produce chips of this class. Even Intel depends on Japan for the whole supply of equipment to produce 30 nm chips. Japanese chip makers need to go back to the starting point and reformatify their broader vertical development capability involving chip production equipment. They also need to change their business model for such equipment from the conventional one geared to selling it off by the piece to one similar to that for chip-design tools. By so doing, they should seek to get both licensing fees and royalties to ensure sustainability of the merits of their invention.

Japan's geographic position is the fifth point that works to the advantage of Japanese consumer electronics manufacturers. They can rely on the ASEAN countries, China and India that are among the fastest expanding markets in the world and that can at the same time provide lower-priced and talented human resources as production centers. They can share roles as partners in technology development projects. Japanese makers will be able to grow further if they can forge a workable division of labor with these countries. There has been a notable trend of late in this respect. Focusing attention on Japanese digital electronics makers' development capability, some European and American firms are preparing to set up their R&D facilities in Japan. Initial steps have already been taken by 3M and DuPont. Their partici-

Chart 4 Position of Japan's electronics industry



Source: *New Industry Creation Strategy 2005*, Ministry of Economy, Trade & Industry

pation in R&D programs in Japan may fuse their front-running product/technology planning capability with the ability of Japanese firms to combine different technologies and swiftly put them to practical use. Such fusion may produce the effect of generating additional new technologies.

Challenges for Japanese Makers

However, Japanese digital electronics manufacturers have a spate of challenges to clear to hone their competitive edge. Networking often leads to creating key added value in this business. Forming a network is valuable in itself. But more important is the value retained by each of the nodes that make a network. What carries more weight is the way each node is forged, or standardization in another way. Japanese have a good ability to find material for a thread and twist it into a cord. But they are far from good at tying the cord into a net. This may have something to do with their geopolitical character as a people born and brought up in an insular country. One can see a similar trait with the British who once dominated the seven seas of the world.

Roles played by a network are manifold. There are an information network, an education network, a security network, a network to better the quality of family life and a network to structure various social systems. Panasonic's Viera Link connecting a TV, DVD, camera and other hardware with an SD card is a similar attempt. From the viewpoint of the digital electronics industry, it will be quite right to think that networking, as with Viera Link, can combine a multiple num-

ber of products to turn out a sophisticated product with greater functions. One may imagine an attempt to combine materials into a product and link different products to offer a network product. Seen in this respect, Japanese makers are better at combining materials and components into products but poorer at putting them together into a product with more sophisticated functions. One reason for this is that any attempt to turn out such high-end products will require greater reliance on software and technologies available only in the rear market where Japanese makers are less competitive. I may say that one problem with Panasonic's Viera Link is that it remains within the framework of a corporate network.

Google, Yahoo!, eBay, Sale dot Com and Amazon are counted as global computer networks. They are known as providers of cloud computing. Japan is way behind in the ongoing Internet race to develop and acquire global markets.

The second challenge stems from a lack of awareness on the part of both the government and industry of the need to make greater efforts to present Japanese technologies as the mainstream of international standardization. They should prepare standards in the early stage of technology development, work out public-private partnerships to make that possible, forge a technology roadmap and push lobbying activities to realize it with the aim of turning Japanese technologies into international standards and establishing intellectual property rights for them. Work is in progress at the International Telecommunication Union (ITU) to formulate common standards for next-generation Net television. Japanese digital electronics manufacturers can sustain their competitive edge by participating and exerting their leadership in such an initiative.

Their third challenge is to have the global market down cold. Clayton Christensen argues that disruptive innovators can overwhelm sustaining innovators. In the Japanese industry or market, makers often aim for overquality. One example is the mobile phone. Japanese makers go all-out to give their products plenty of added value and features to differentiate them from those offered by their rivals. At global levels, however, simple and

practical products form the mainstream. When Japanese makers developed and marketed high-grade GPS devices, European peers came out with simplified models and carved out bigger market shares. Too much emphasis on technology is one of the factors that pull Japanese makers away from the global current. That's why some people say Japan is becoming a Galapagos. I don't mean to undervalue the importance of the technology innovation ability. However, I think a product that can be a global standard is born when new functions available with a new technology come to terms with what is required in the market. Japanese manufacturers also need to change the present situation where their new technologies and products are easily copied. They should develop a new cryptosystem based on global standards to make protection of intellectual property really work. This is a future challenge for the Japanese industry.

Roadmap Toward Global Market

Japanese makers need to enhance the consistency between their technology and the market trends at the time of product planning. They should absolutely know well the market before kicking off their product development. Only after listening to voices in the market should they determine whether their planned product will prove fit now or in the immediate future. Any business should be promoted on the balance of the two wheels of management strategy – technology development strategy and marketing strategy. Japanese companies should also build up their networks linking production, marketing and development. To do so will hold the key to resolving the problems posed by Japan's declining population in each area of production, marketing and development, and lays the foundation for their sustained growth. **JS**

Norio Gomi is a special guest professor at the School of Business Administration of Meiji University in Tokyo. Prior to assuming the post, he had held various positions in the business world and academia from 1996 to 2000. A graduate of Hitotsubashi University, Gomi started his academic career after leaving the business community in 2001. He also teaches at Kyorin, Takushoku and Chuo universities.