The Competitive Strategies of Taiwanese Hi-Tech Industry

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ABSTRACT

The competitive strengths for Taiwanese hi-tech industry are broadly discussed in many circumstances. Many Taiwan’s companies are small and medium enterprises which cannot enjoy benefits from economy of scale. However, the development of Taiwanese hi-tech industry has proven that the clustering and flexibility of changes are alternatives of competition. This paper presents the developing processes of hi-tech industry such as OEM, ODM, and OBM stages to reveal the competitive strategies of Taiwanese hi-tech industry. Thus, the challenges and future visions are also discussed.

Keywords: Hi-tech industry, OEM, ODM, OBM

INTRODUCTION

The dominant competitive strengths for Taiwanese Hi-tech industry are broadly discussed in many circumstances. The empirical result is extremely controversial from some industrial organization theories. Many Taiwan’s companies are small and medium enterprises (SMEs). SMEs cannot enjoy benefits from economy of scale. However, the development of Taiwanese personal computer industry has proven that the clustering and flexibility of changes are alternatives of competition. In the past, many multinational enterprises such as DELL, HP, SONY, IBM and Microsoft came to Taiwan to set up their research & development (R&D) centers. Considering the keen competition in hi-tech industries nowadays, the reason why the multinational enterprises are willing to invest in Taiwan is that Taiwan has the following advantages:

--Completely developed supply chain of information industry, highly industrial clustering, and efficient logistics, which are conducive to the formation of economy of scale.
--Taiwan has high quality R&D talents as well as the advantage of relatively low cost of R&D.
--In the past three or four decades, plenty Taiwanese students pursued their education overseas, and in consequence many ethnic Chinese technological professionals became the heads or the founders of US-based hi-tech companies. Once these people reach the climax of their careers, many will become homesick and return to Taiwan.
--The major global consumer markets have gradually switched from North America and Europe to Asia. Close to the markets, Taiwan is able to provide integrated, systemic services, such as design, development, and manufacturing.
--The government’s industrial promotion policy supports give considerable encouragement, such as R&D allowance, and production-enhancing concession, etc.
--In Taiwan, application of the Internet and the related infrastructure grow rapidly, as found in every trade. According to the Global Information Technology Report 2002-2003 released by the World Economic Forum in February 2003, Taiwan ranked 15th out of 75 countries in 2001 in terms of the Network Readiness Index, NRI of an information oriented society, but Taiwan ranked 9th out of 82 countries in 2002.

Generally speaking, production contracts from US companies in the 1990s gave Taiwanese high-tech industries an opportunity to grow. Now, the R&D outsourcing of US companies, coupled with the US companies’ focusing their efforts on marketing and brands, also offers Taiwanese hi-tech industries an opportunity to transform and promote themselves.

A REVIEW OF DEVELOPMENT OF TAIWANESE HI-TECH INDUSTRY

In the early 1980s, Taiwan’s information industry started to develop in the form of original equipment manufacturers (OEM). Afterward, to enhance its competitiveness and profitability, Taiwan’s information industry gradually upgraded itself by engaging in product design and production management. Considering a persistent reduction
in product costs and a change of the industry’s structural ecology, it is necessary to fully combine, under an industrial structure of vertical division of labor, logistic supplies management systems like marketing, design, production, procurement and warehousing by means of a good logistic system in order to achieve efficient, cost-efficient operation. Hence, manufacturers have to adjust their operation models and business strategies promptly. As a result, this brings about a global logistic model which, coupled with cross-strait division of labor, forms a complete operation system, enabling Taiwan’s information hardware industry to persistently maintain a certain degree of competitiveness. The operation model adopted and the progress made by Taiwan’s information industry in the development of global PC industry are analyzed as follows.

IBM-compatible computers were developed in 1982. The first 32-byte personal computer that ended IBM’s monopoly was developed in 1986, setting the basis for the development of Taiwan’s information hardware industry. Afterward, various peripheral products, parts and accessories were developed within the Wintel system structure controlled by Intel and Microsoft, and in consequence an information hardware industry with a complete midstream and downstream structure was gradually built.

By the 1990s, the standard of Taiwan’s information hardware technology has almost been kept abreast of that of the international giants. However, Taiwan’s information hardware industry failed to master many key parts/components and thus its development was retarded. Hence, the government worked very hard with the industry in promoting investment and getting involved in the key parts/components industry. As a result, the core of the development of the whole information industry switched from a production-oriented stage to an investment-oriented stage, leading to the prosperity of a fast growing information industry that began in 1992. In addition, Taiwan became the third largest product production country in the world; in this regard, investment on TFT-LCD should be the most typical of its kind.

To enhance the industry’s competitiveness, the government made great efforts to promote investment in key parts/components; Taiwan’s TFT-LCD industry was created due to the great demand for downstream notebooks and monitors as well as the government’s promotion. Starting from 1996, several related manufacturers appeared, and they benefited from technology transfer from Japan, which was then followed by successful mass production; as a result, Taiwan became a country of suppliers to worldwide TFT-LCD, which has a positive effect on the enhancement of Taiwan’s information industry’s competitiveness.

Owing to a drop in the prices of notebooks worldwide and an increase in the performance of Taiwan’s notebook industry, orders surged in 1999 and thus Taiwan surpassed Japan in total output for the first time in 1999 – Taiwan had a market share of 49%, whereas Japan had a market share of 40%. At that time, Toshiba, the leading manufacturer in the world, began to give orders to Taiwan in the fourth quarter of 1999; while the orders were limited, they were formal orders instead of trial orders. Hence, the significance of the year 1999 lies in what the change was rather than how much the change was. The change was obviously conducive to the ensuing increase in the throughput of Taiwan’s notebooks.

At that point, Taiwan’s information hardware industry developed to such an extent that Taiwan ranked first in its market share regarding notebooks, motherboards, monitors, scanners, graphic cards, and modems. However, the development of Taiwan’s information hardware industry still centers on the production of personal computers, thus for the time being the overt benefit is that Taiwan keeps its competitiveness in design/production activities. This sufficiently indicts that Taiwan’s information hardware industry is slow in upgrading itself by shifting to high value-added activities in the global value chain.

After 2000, the Internet became popular so rapidly that the trend toward 3C integration was becoming more obvious; this ushers in the post-PC era of the information industry. While the PC market witnessed a development bottleneck, the prevalence of the Internet remained unchanged. Hence, technology related to communication networks was definitely the expertise indispensable to the development of information products in the post-PC era.

Most existing PC manufacturers believed that the value offered by PC should not be limited to computing; instead, they suggested that it should begin to cover mobile information. In Taiwan, several information-related manufacturers took actions to launch into the R&D of communication network technology, attempting to combine different types of information, such as data, voice and video, so as to provide Internet-based multimedia services, and in consequence information appliances (IA) products, such as personal smart cellular phones, multiplayer network games, and Tablet PC, began to appear. Besides, digitalization was an irresistible trend, thus products like DVD and digital cameras
became best-selling products on the market. While related manufacturers were able to keep abreast of the trend and launched into the R&D of the aforesaid products, Taiwan’s information industry witnessed negative growth in 2001 because of global economic recession as well as the macro-environment wherein PC were sold at low prices and the PC market was becoming more saturated.

**EVOLUTION OF THE OPERATION MODEL OF TAIWAN’S INFORMATION INDUSTRY**

When PC products switch from a high-growth stage to a stage where the prices are low and the market demand changes rapidly, those Taiwan-based manufactures engaged in PC products manufacturing should not only attach great importance to production cost control but also attach great importance to material cost control and efficient management of the supply chain. It is only when the above-mentioned is achieved can the costs incurred at all stages be cut so that the total cost can be reduced and profitability can remain unaffected. Hence, Taiwanese manufacturers’ logistics varied with the developmental stage of the industrial ecology and international giants’ development.

After the international giants had changed their logistic model, the Taiwan-based PC manufacturers, which were mainly engaged in OEM, had to change their logistic model accordingly in order to meet customer needs. Hence, identifying and meeting the giants’ needs became one of the important factors in the development of Taiwanese manufacturers’ logistic model. Since most Taiwanese manufacturers chose to identify and follow customer’s logistic model, not only did they grow along with the giants, but they enhanced their own competitiveness and facilitated related planning. At various stages, a manufacturer expand its services after becoming more competent, for example, shifting upward from merely OEM to original design manufacturing (ODM), and taking a step further and downward to expand its logistics service. The evolution of Taiwanese manufacturers’ operation model in the past two decades is briefly described below.

Prior to the 1980s, the Taiwan-based operation model was mainly OEM whose business primarily involved ‘manufacturing’. In the late 1980s, the operation model switched from OEM to ODM gradually and thus the business extended from manufacturing to assembly downward and procurement of parts/components upward. Prior to the mid-1990s, in addition to the ODM operation model, there was the logistic management model. After the mid-1990s, great importance was attached to ‘global logistic management’. Hence, in the 1980s, Taiwanese manufacturers attached great importance to their manufacturing capacity and stressed low production costs. Prior to the mid-1990s, Taiwanese manufacturers attached great importance to their supply chain management capacity. After the mid-1990s, they took a step further to stress creativity and design capacity, and at that stage they provided services and stressed the reduction of the total operating cost.

**Original Equipment Manufacturing Stage**

Also referred to as outsourced manufacturing, OEM operates in the following way: A manufacturer (e.g. a Taiwan-based information product manufacturer) carries out product production and assembly in accordance with the product specifications and the manufacturing rules specified by a buyer (e.g. IBM). In other words, not only does the manufacturer focus its attention on the production and manufacturing of products, but it delivers finished products, using the delivery method and the brand specified by the buyer.

With the aforesaid notion, OEM business stresses efficiency of production, and a buyer contracts out the production and manufacturing activities to an OEM with a view to cutting the product’s manufacturing cost, and therefore there is vertical division of labor between both parties regarding design, marketing, production and manufacturing. This occurs, not only intended for cost efficiency, but also leading to a model of strategy competition.

**Original Design Manufacturing Stage**

Also referred to as outsourced design, ODM operates in the following way: A manufacturer is capable of undertaking product design, development and manufacturing but is not directly engaged in marketing and brand promotion.

As for the relationship between an ODM and a buyer, both parties discuss the product specifications, or the ODM recommends the buyer the product specifications and the design drawn up independently by the ODM and then receives the approval and an order from the buyer, and then the ODM is in charge of production and delivery.
As for ODM business, it connects a buyer’s marketing capacity with an ODM’s capacity of product design, development and manufacturing, and it is about the division of labor and cooperation on production and marketing occurring in the product value chain.

**Electronic Contract Manufacturing**

Electronic Contract Manufacturing (ECM) originates in Contract Manufacturing. Contract manufacturing allows some companies to run their business without any physically existing factory. Price pressure and the need for global product expansion prompted the contracting manufacturing model to grow.

The term, ECM, appears, because the aforesaid business is common to the electronic industry. A new operation model of the electronic industry called Electronic Manufacturing Service (EMS) is developed.

**Electronic Manufacturing Service**

Also known as Electronic Professional Outsourcing, EMS is actually a service industry, which distinguishes it from the service characteristics of general merchandise sales. EMS involves product design service, component procurement service, manufacturing service, delivery service and global maintenance service.

Since EMS is a service industry, it has to meet customer needs. Hence, EMS is characterized by prompt, efficient reactions at individual stages. At present, EMS mostly targets a diversified operation model whereby not only various customer needs can be met on one single occasion but also global business can be developed and information can be promptly sent and received with a view to assisting customers in developing their global business.

Conventionally, the manufacturing of computers, communication hardware and other electronic items are likely to be outsourced to EMS providers. In the eyes of general manufacturers, outsourcing has gradually become a cost-efficient strategy. Many manufacturers outsource old, mature production lines so that they can be devoted to those products which are new, technically complicated, lucrative.

EMS has been developed in Europe and North America for more than two decades. It provides a full range of manufacturing services involving variety of categorization, mass production and global logistics. The late 1990s witnessed a 20~25% annual compound growth rate of global EMS industry, and the rapid growth also attracted plenty of Taiwanese manufacturers, including Hon-Hai Precision Industry Co., Ltd., to join the industry.

Given the remarkable advances made in information technology, the information industry has to pursue integrated performance in cost, quality and speed in order to meet customer needs. The rise of EMS forced OEM/ODM, or those manufacturers which attach great importance to their own brands, to follow suit and announce their planned transformation. Nevertheless, given their scale of manufacturing, breadth of product lines, growth and performance, the newcomers were unfit to compete with the EMS giants.

Purchases of, and integration/mergers between, EMSs are not uncommon, and in consequence the industry has a tendency toward vertical integration. Starting from 2000, the global economic recession appears, and the life cycles of electronic products are becoming shorter, and profits diminish persistently; as a result, EMS industry has entered an era of low profits. Nevertheless, according to a survey conducted by a US-based electronic institution, the EMS market will remain a high-growth market.

**Own Brand Manufacturing Stage**

Own Brand Manufacturing (OBM) is the manufacturers sell products of their own brand. The necessary conditions of an own brand are, namely funds, R&D capacity, and marketing channels. As regards the initial strategy for their own brands, most enterprises adopt market or product differentiation in order to avoid conflicts. Their medium/long-term strategy is to gradually decrease the OEM/ODM ratio in the face of an increase in the market share rate of their brands. Once an enterprise acquires its own brand, it will attach great importance to design and R&D.

Taiwan-based EMS and ODM providers may make profits by marketing their own brands worldwide. Creative, intense, persistent marketing, cost-efficient marketing channels, and after-sales services may bring about fame and build up reputation.

EMS and ODM providers should make good use of each other’s advantages, so as to improve their products, enjoy the logistic advantages derived from their cooperative relationship, and organize global distribution/marketing. The own
brand products and markets of the EMS and ODM providers should be differentiated from those of their OEM clients and the world’s leading manufacturers for the sake of differentiation and prevention of market conflicts and price competition. Taiwan’s own brand manufacturers are listed in Table 1.

<table>
<thead>
<tr>
<th>Company</th>
<th>Brand Name</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quanta</td>
<td>Nu, Gia</td>
<td>ODD, cellular phone, display monitor, LCD TV</td>
</tr>
<tr>
<td>Asustek</td>
<td>ASUS, ASRock</td>
<td>PC, PC-motherboard, ODD, PDA, cellular phone</td>
</tr>
<tr>
<td>Mitac</td>
<td>Mio</td>
<td>Smartphone</td>
</tr>
<tr>
<td>Inventec Appliance</td>
<td>OKWAP</td>
<td>Cellular phone</td>
</tr>
<tr>
<td>Gigabyte</td>
<td>AXPER</td>
<td>PC-motherboard, mini PC, Notebook PC, LCD TV</td>
</tr>
<tr>
<td>Elite</td>
<td>-</td>
<td>PC-motherboard, mini PC</td>
</tr>
<tr>
<td>FIC</td>
<td>Afina</td>
<td>Mini PC</td>
</tr>
<tr>
<td>Compal</td>
<td>Palmax, Optorite</td>
<td>Cellular phone, ODD</td>
</tr>
<tr>
<td>Hon Hai</td>
<td>Foxconn</td>
<td>PC-motherboard</td>
</tr>
<tr>
<td>BenQ</td>
<td>BenQ</td>
<td>Notebook PC, MP3, LCD TV</td>
</tr>
<tr>
<td>Tatung</td>
<td>Elio</td>
<td>MP3</td>
</tr>
<tr>
<td>TPV</td>
<td>AOC</td>
<td>Monitor</td>
</tr>
<tr>
<td>HTC</td>
<td>Dopod</td>
<td>PDA</td>
</tr>
</tbody>
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Source: Datum is adopted from reference papers.

According to the IT IS plan drawn up by the Industrial Economics and Knowledge Center of the Industrial Technology Research Institute of the Republic of China, by making reference to the industrial capacity accumulated by Taiwan’s information hardware industry in the past, and with an evaluation of market and technology, mainstream products of the coming years until 2007 are selected, and they are, namely, game console, tablet PC, PDA, smart phone and set-top box. Table 2 shows a brief description of them with regard to an analysis of the industrial capacity available to future mainstream products and Taiwan’s opportunity.

THE CHALLENGES AND VISIONS FACING TAIWAN’S INFORMATION INDUSTRY IN THE FUTURE

Once the market enters the “era of mobile network service and consumer IA”, it will mean that new application concepts will gradually form, which will, in turn, mean that the existing products or the introduction of new products are going to enter a stage of growth. Two strategies are available for Taiwan’s information hardware industry, namely developing outsourced business, and developing a brand on one’s own. The two strategies are faced with the following challenges.

The Challenge of Setting OEM/ODM to Be an Ultimate Objective

In operating their OEM/ODM business, Taiwanese information industry is chiefly concerned about two types of business, namely cost advantage and quality control. Hence, outsourcing-based business is faced with the following challenges such as awaiting market’s time, improving products repeatedly, and maintaining cost advantage.

Taiwan’s manufacturers have the enormous advantage regarding product design and manufacturing. A current challenge is the advent of market’s time (the opportunity for outsourcing), making good use of the opportunity appropriately, performing planning in advance. In the near future, Taiwan will continue to face the looming production-related challenges from China, thus Taiwan’s manufacturers have to enhance the advantage of good product design. Normally, the factors in creation and maintenance of cost advantage are, namely high product conforming rate, which results from a combination of good product design and good manufacturing process, and acquisition of elements of production, such as cheap land and labor. At present, to maintain their cost advantage, Taiwan’s manufacturers
usually choose Mainland China as their production bases.

Table 2  Future Mainstream Products Opportunities for Taiwanese Manufacturers

<table>
<thead>
<tr>
<th>Future Mainstream Product</th>
<th>Use of Industrial Capacity</th>
<th>Opportunity for Taiwan’s Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game Console</td>
<td>Capacity of desktop computer design</td>
<td>Hardware price competition on the market between Sony, Nitendo and Microsoft, the three leading game console manufacturers</td>
</tr>
<tr>
<td></td>
<td>Cost control</td>
<td>The aforesaid giants outsource hardware production services to Taiwan’s information industry in order to acquire cost advantages</td>
</tr>
<tr>
<td></td>
<td>Global logistic management</td>
<td></td>
</tr>
<tr>
<td>Tablet PC</td>
<td>Wintel technology</td>
<td>Microsoft’s support for application software, including handwriting identification technology</td>
</tr>
<tr>
<td></td>
<td>Notebook design capacity</td>
<td>Participation by leading computer manufacturers, such as Acer, HP and Toshiba.</td>
</tr>
<tr>
<td></td>
<td>Heat dissipation capacity</td>
<td>What the market expects of new products</td>
</tr>
<tr>
<td></td>
<td>Technology for integration of wireless local networks</td>
<td>Decrease in price, and OEM/ODM production opportunity</td>
</tr>
<tr>
<td></td>
<td>Cost control</td>
<td></td>
</tr>
<tr>
<td>PDA</td>
<td>Wintel technology</td>
<td>Putting low-price PDA on the market</td>
</tr>
<tr>
<td></td>
<td>Miniaturization design</td>
<td>Dell’s participation and market promotion</td>
</tr>
<tr>
<td></td>
<td>System integration capacity, including information hardware, OS &amp; application software, Internet application, wireless network integration.</td>
<td>Application of wireless communications</td>
</tr>
<tr>
<td></td>
<td>Cost control</td>
<td>Diversification of multimedia application</td>
</tr>
<tr>
<td>Smart Phone</td>
<td>Product miniaturization design</td>
<td>Opportunity for production by OEM/ODM in the market</td>
</tr>
<tr>
<td></td>
<td>Communication network design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>System integration (application and integration of data and voice)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cost control</td>
<td></td>
</tr>
<tr>
<td>Set-top Box</td>
<td>Motherboard design capacity</td>
<td>Advent of the digital broadcast era</td>
</tr>
<tr>
<td></td>
<td>System integration capacity (information hardware, OS &amp; application software, Internet-based communication technology integration)</td>
<td>Application of interactive services</td>
</tr>
<tr>
<td></td>
<td>Cost control capacity</td>
<td>Formulation of a common interface</td>
</tr>
</tbody>
</table>

Source: Datum is adopted from reference papers.

The Challenge of Setting Own Brand to be an Ultimate Objective

OBM is equivalent to B2C business. However, Taiwanese manufacturers nowadays are mostly engaged in B2B business, because Taiwan’s information industry relies on ODM/OEM for development of their global market and thus the key parts and components they produce have to be based on B2B business. Certainly, both OBM and B2C business should be their future goals, but Taiwan’s manufacturers have to address the following challenges:

(1) Taiwan’s manufacturers have to do business in Mainland China’s market as efficiently as they are when doing business in Taiwan.

(2) Taiwan’s manufacturers will not be able to develop (B2C) own brand business, unless they treat Mainland China’s market as their hinterland.

(3) Taiwan’s manufacturers have to create Mainland China-based, B2C, global, internationalized brands in accordance with the two conditions mentioned above. If the problems remain unsolved, Taiwan’s manufacturers will find it
difficult to create more Taiwan-based, global, B2C brands.

(4) Not only should the Taiwanese government make good use of the industry in order to help the manufacturers jointly promote the images of “Taiwanese Gifts”, but also the manufacturers should be willing to participate in and support the cause and be willing to highlight the correlation between one’s brand and Taiwan.

The Visions of Shaping “Taiwan Inside – Taiwan Design” or Taiwan innovation images

The pursuit of the know-how, creation and popularization of digital product is always relevant to Taiwan. The know-how about digital products is usually embodied in key parts and components, whereas the creation of digital products usually originates in application. By popularization, it means shaping “Taiwan Inside – Taiwan Design” or Taiwan innovation images

Taiwan’s market is quite limited, thus it is impossible to develop the mass production of products unceasingly; instead, it is important to upgrade Taiwan’s added value continually. Being intangible is more important than being tangible, whereas as quality is more important than quantity. Enhancement of added value signifies “high-value”. The term “high-value” has two types of connotation. First, it means enhancement of the “added value of unit price”. Second, it means high quantity and a high “total of added values”, that is, a high market share rate.

Exclusiveness and scale have to be the elements of competition

Like the shoe manufacturing industry that existed two decades ago, the information industry nowadays has become capital intensive, involving low value-added assembly. Hence, success cannot be achieved merely by creation. Once a manufacturer puts an innovative product on the market, the manufacturer, when failing to popularize the new product before the other manufacturers follow suit, will be driven out of the market because of the high cost of the new product. Every hi-tech industry nowadays is a large one, as it is important to increase operating efficiency continually by means of the scale of economy. Hence, exclusiveness and scale should be the elements of competition. By exclusiveness, it means that if a manufacturer wants to product notebooks, it will have to carry out procurement in Taiwan, otherwise it will not be able to compete with its rivals in the international market. Another important element of competition for the hi-tech industries nowadays is scale, and even Intel and DELL are subject to this. In Taiwan, even TSMC, AUO and Hon-Hai are expanding their scale continually in order to increase their operating efficiency and cut their costs unceasingly with a view to becoming the best one in the world.

The Path from B2B to B2C

In addition to B2B and B2C, Taiwan’s information industry can use a feasible model, that is, B2B2C. Intel is an exemplar for B2B2C. Promoting “Intel Inside”, Intel instills an influential brand image into consumers by means of intense marketing. In the near future, with its existing B2B basis, Taiwan may extend to C.

There are two ways to make Taiwan’s innovations noticeable and therefore they attract consumer notice. First, creating one’s own brand, as consumers can notice it readily. Second, like Intel, stressing that all customer products are Intel Inside, and even suggesting that a mere label of Intel Inside should indicate that the product is excellent. If Taiwan Inside achieves the above-mentioned, it will impress consumers in the market.

Make Service Technology-based and Replicate Know-how by Technology

As regards knowledge economy, it is necessary to create and use knowledge unceasingly. When it comes to the creation and the use of knowledge, the service industry will have more spacious room for operation than the manufacturing industry will, because the service sector accounts for two-thirds of an economy, whereas the manufacturing sector accounts for one-third of an economy. Taking supply chain management for an example, the information technology which controls the operation of the whole supply chain belongs to the service sector, so is the global logistic management of various materials, whereas the efficient arrangement and allocation of money flow are services. In the course of the management of the whole supply chain, the cost reduced by services is much greater than the cost reduced by PC products.

As exemplified by PC manufacturing, its materials and manufacturing process are more or less the same to
individual manufacturers. However, the reason why both Dell’s direct selling model and Taiwan-based Acer’s new marketing/operation model succeeded is because all the manufacturing processes are integrated and linked up by their efficient service mechanism. As shown by the aforesaid examples, there is a trend toward enormous quantity and low gross profits as far as technology-based digital products are concerned. Hence, it is important for enterprises to efficiently enhance their channels and logistic systems, using a global service industry system. In this regard, what the service industry possesses is know-how, and it is the information technology system that is conducive to efficient replication of the know-how and expertise.

Taiwan has to integrate the talents and know-how of the United States, the talents and market of China, and Taiwan’s talents, funds, and capacity of product commercialization and internationalization. In the event that India’s talents and software resources are introduced into Taiwan, win-win partnerships can be formed between Taiwan and India. Those ODM manufacturers who want to upgrade their software and enter the future market have to cooperate with India, a country famous for software outsourcing. On the other hand, India will benefit by its future cooperation with Taiwan, as far as its development is concerned.

REFERENCES


