

Challenges for the High-tech Industry

By Fred F. Yoshino

"With very limited natural resources, Japan has emerged from the ruins of World War II to become one of the world's greatest economic powers. Much of its phenomenal success was attributed to placing national priority on developing high technology," commented Dr. Otto C.C. Lin, president of Taiwan's Industrial Technology Institute at the High Technology and Profitability for the 21st Century Conference held in Hong Kong on May 18 and 19, 1993.

The Japanese experience is being shared by Asian newly industrializing economies (NIES), particularly Taiwan and South Korea as they too are fast becoming high-technology economies. Developing nations in the region, such as China, India and Indonesia, are trying hard to seize on this opportunity to take off. It would not be much of an exaggeration to say high technology plays a vitally important role in today's national competitiveness. At the same time, technological advancement is the name of the game for almost every business firm the world over, since it is the key to survival and success in the market place. It thus stands to reason that we attach prime importance on technological development. But high technology is hard to come by, and there is no shortcut in attaining it.

Hatakeyama Noboru, vice minister for International Affairs at the Japanese Ministry of International Trade and Industry emphasized this point during the conference by saying "In short, high technology leads to economic development only when the infrastructure, hard and soft, as well as the human resources to run it, exist to support the technology."

"Hard" infrastructure refers to a sophisticated and accessible transport system as well as a highly-developed telecommunications network and a free-flowing energy system. Without this hardware, high technology would not be able to get off the ground. "Soft" infrastructure consists of good and transparent rules, and the institutional setup to administer them effectively and impartially. Specifically, this legal framework embraces the protection of patents, copyrights and other intellectual properties as well as industrial stan-

dards, custom rules and regulations.

Understandably, hard infrastructure coincides with the conventional usage meaning highways, airports, power stations, telephones, etc. However, it should be noted that the mere availability of these facilities has little practical significance as they can only function smoothly and effectively as one integrated mechanism. And in an environment where the soft infrastructure is lacking, it is difficult for a high-tech driven economy to grow soundly. Incentive to spend a vast sum of research and development (R&D) investment money is hampered when innovative products are constantly exposed to counterfeiting malpractice.

Further, Mr. Hatakeyama stressed the need to develop the human resources capable of running both hard and soft infrastructures efficiently. Take an example of a top-notch airport, one could import workers, but probably not to the extent that the sophisticated airport system is operated without a hitch. "... all this infrastructure could exist physically or on paper with little practical effect if the human resources to actually make them work is missing," said the vice minister.

In recent years claims have often been made by developing countries that technologically advanced nations are reluctant to respond to requests for technology transfers. However, chances are that many high-tech hungry countries have not yet fully established the kind of key foundations discussed earlier. And they are liable to simplistically believe that once transplanted, transferred or licensed technologies can blossom immediately. No shotgun approach of this sort will work. "If there is cause for concern in this region [Asia], it is the fear that the infrastructure and human resources will not grow at a pace that will match the economic development led by the vibrant entrepreneurial spirit that is evident here," cautioned Mr. Hatakeyama at the high-tech conference in Hong Kong.

Japan's Official Development Assistance (ODA) has actively contributed to infrastructure and human resource building of neighboring Asian countries.

According to Mr. Hatakeyama, for fiscal 1990 government-affiliated agencies and non-profit organizations with public assistance accepted 7,851 trainees and dispatched 5,865 experts to and from Asian countries. While in the private sector, during the same period, a survey of Japanese firms active in Asia shows that 703 firms, or 41.9% of those surveyed, operated a training system and employed 23,627 trainees, mostly in manufacturing, from Asia. Continued Japanese support, both public and private, is required to help a needy Asia. But it is important to note again that high technology cannot do it alone. For a sustainable growth of the Asian economy, a concerted effort is required, particularly in the area of social foundation.

Strategic alliances: Give and take

IBM is allied with Apple Computer, so is Toyota Motor Corp. with General Motors. The kind of corporate nexus that was almost beyond imagination decades ago, now appears to be a trendsetter on the business scene in the 1990s. It is solemnly called strategic alliance, albeit it is more often than not a relationship of short-term expediency to supplement each other's Achilles' heel. In a nutshell, the strategic alliance is like a special-purpose task force in the military, independently organized from more than one combat unit. Mind you, however, it is not necessarily a pickup team of fighting professionals like the Green Berets. The mission varies with alliances; some seek innovative product designs as a spin off of their joint R&D effort, others may hope to achieve cross-border market penetration.

Unlike joint ventures and mergers and acquisitions (M&A), these alliances do not require an equity connection between partners, thus neither party has control over the other(s). This kind of corporate collaboration is sometimes referred to as a loose coupling corporate network. While retaining a high level of autonomy, each collaborating partner provides some of its management resources (i.e. capital, specific cutting-edge technology, distribution

network) for the joint project in order to push forward business frontiers or expand parameters. As these frontiers and parameters are different depending on partners, complementary exchanges do occur.

For instance, in exchange for helping a counterpart's marketing plan enter your home market, receiving certain technological know-how in return. This means that partners are likely to carry respectively different agendas when formulating an alliance, though they share a common hunting ground (business domain, in management jargon), and reciprocate each other by filling in the other's weaknesses and gaps. A simple analogy would be a potluck party where invited guests get together, all bringing some food. When your wallet is fat you may as well treat yourself to an expensive dinner at a posh restaurant; otherwise, the potluck option would be much better, in terms of cost saving and variety, than preparing a simple meal yourself.

Why then, are so many world-class large corporations scrambling in droves to this kind of potluck business? They are in dire need to find business relationships that limit exposure to expensive research projects while avoiding the difficulties and expense of a M&A. It is natural that management wants to do everything on its own rather than linking up with rival companies. But it now costs too much to go it alone. For instance, the development cost for the next-generation auto engine is estimated at over ¥500 billion; no single corporation can ante up such a vast amount of money. Money guzzling dynamic random access memory (DRAM) development is another typical case. This funding bottleneck is working as a pressing incentive to corporate alliances. Particularly in recent years, R&D costs have increased exponentially, and "... it is difficult for a single corporation to shoulder the huge financial burden of R&D," said Kato Yasuo, executive vice president of NEC.

Another challenge is market globalization and the enormous diversity of products needed. In *Collaborating to Compete* (published by Wiley), McKinsey's Mr. Ohmae Ken'ichi says "Today's products rely on so many different critical technologies that most companies can no longer maintain a cutting-edge sophistication in all of them." For instance, IBM is very active in making alliances to strengthen specific elements of its busi-



Hong Kong Governor Patten delivers a speech during the conference.

ness system; with Toshiba Corporation for development of liquid crystal displays (LCD), with DEC, Apple and Hewlett-Packard for joint development of operating system for work stations, with Siemens for development of 64-mega byte DRAM, and with Microsoft for joint software development.

In addition, an accelerating pace of product cycles, in an increasingly synchronized global market, is making it difficult for a solo player to respond quick enough to customer demand. Thanks to an advanced VLSI production technology, semiconductor memory capacity has quadrupled almost every two years and now we are living in the age of 4-MB DRAMs. The onset of a multimedia thrust is also just around the corner.

Corporate alliances have many advantages over M&As. Financially, resource-sharing alliances are much cheaper than a M&A where you have to pay a premium for obtaining the resources needed to conduct business. NEC's Mr. Kato is quoted as saying, "The M&A option can exert a huge financial burden on the dominant or acquiring company. There can also be compatibility issues in uniting what might be distinctly different corporate cultures, and other management options."

The tendency toward alliances is also prompted by the current equity market situation, where capital funding is no longer easy with the puncture of the bubble economy and a decline in earnings has been

recorded by many high-tech companies. Alliances are positioned between the two extremes, namely M&A and self-help, according to Mr. Kato who pointed out that "... alliances can provide an intermediate and flexible solution to many business needs." He characterized alliances as transitional by nature, while Fujitsu Ltd.'s Executive Vice President Otsuki Mikio likes to emphasize a long lasting relationship based on mutual trust. On the other hand, Toshiba's Kawanishi Tsuyoshi, senior executive vice president interestingly compared alliances to a friendship between partners, not the co-dependent relationship of a married couple.

However, Mr. Ohmae argues that an alliance is a lot like a marriage. "There may be no formal contract. There is no buying and selling of equity ... no one expects a precise, measured return on the initial commitment. Both parties bring to an alliance a faith that they will be stronger together than either would be separately. Both believe that each has unique skills and functional abilities the other lacks. And both have to work diligently over time to make the union successful. When one partner is weak or lazy or won't make an effort to explore what the two can do together, things can come apart. One-sidedness and a symmetry of effort and attention doom a relationship," writes Mr. Ohmae in *Collaborating to Compete*.

In return, Toshiba's Mr. Kawanishi

added, "With friends, you can have as many as you want, but this is not the case with a wife." His company has a joint venture with Motorola and an investor relationship with Time Warner. For its alliances with IBM and Siemens, it had to develop 256-MB DRAMs with Apple Computer. With these relationships, Toshiba has benefitted by resource allocation, complementarity of core competence, and access to different cultures. As to possible conflicts, Mr. Kawanishi gave an example of the tri-party alliance composed of Siemens, Toshiba and IBM. "Americans and Germans are very assertive, insisting on what they believe to be best, so you need a good conductor to orchestrate the alliance unit. Being modest and patient, we have found ourselves ideal coordinators."

Making an alliance work

In order to make an alliance successful, Mr. Kato of NEC listed some important factors: (1) each alliance partner should have a core competence in an area that can be exchanged, and must be willing to contribute to the alliance, (2) the partners should reciprocate to one another as much benefit as possible, (3) the alliance should produce synergy, a multiplication effect, (4) mutually weak points are supplemented, (5) the real relationship is established on an ethic of mutual trust rather than legal contractual terms alone, and (6) alliance partners must exercise patience especially when faced with difficulties and differences. NEC is allied with AT&T for developing complementary metal-oxide semi-conductors (CMOS), marketing integrated circuits (IC), and producing HOBBIT chips in the semiconductor sector. NEC is also strong in the computers and communications sectors where the company collaborates with IBM, DEC, STRATUS, Control Data and Bull HN. Another interesting movement is the alliance with MIPS Technologies for RISC microprocessors.

Fujitsu's Mr. Ohtsuki goes a step further to position the main objective of strategic alliances as collaborative creativity. "If companies form relationships for the purpose of collaborative creativity, then they will be able to solve problems, make discoveries, and create products much more efficiently," he explained. As a background for the quest of collaborative relationships, information technology (IT)

firms are faced with the dilemma of rising development costs and shrinking margins, thus having little choice but focusing on the particular areas in which they are strongest, and forging complementary linkages with other technologically competitive companies.

Another strong motive for prompting corporate entente is the cost sharing requirement. For the IT industry, which is sailing into uncharted waters with yet unforeseen challenges ahead, this is indeed a great benefit. Among the kind of tangible/intangible synergetic results that Mr. Ohtsuki expects to get from strategic alliances are: (1) joint development power, (2) complementary product lines, (3) the exchange of technological and managerial "know-how," (4) and access to one another's markets.

Among his tips for successful collaboration are mutual trust and understanding of both parties, mutual and continuous commitments from upper management, mutual respect for the autonomy of each other's management, mutual respect for another's corporate culture and willingness to learn from the partners, and devices for ensuring smooth operation, such as unification of development tools and a regular exchange of personnel. "I think that companies that survive in the future are those which understand the need for collaborative creativity, those which make their strategic alliances work, and those which are able to efficiently focus their management resources on their core technologies" summarized Ohtsuki.

Since 1970 Fujitsu has developed close ties with Amdahl, cooperating in areas such as computer CPUs, peripherals and software. Fujitsu acquired the largest U.K. computer manufacturer ICL in 1990 (occupying 80% of ICL's stock), whose "miraculous" success story was covered in a recent issue of the *Economist*. According to the weekly, the secret of ICL (virtually alone in making money while other European computer giants are heavily bleeding) is attributed to synergy effects and Fujitsu's "Keep them at arm's distance" policy. Mr. Tokukura, in charge of technological support for ICL, is quoted as saying, "We are now trying to proceed to the next stage of joint product development drawing on our mutual strength, since our complementarity product line is doing fine."

While many rosy pictures have been

drawn about strategic alliances, you may by now be wondering how true it is and might ask yourself if there are problems with corporate alliances. In many cases where the parents involved with an alliance tend to seek different fruits from the collaboration, there is little guarantee that they would evaluate the asymmetrical benefits in mutually equal-value terms. Failing to receive less from others can be detrimental to maintaining the relationship, and in the worst case, it will lead to a sudden break-up. Alliances could meet a premeasured death unless well taken care of.

Suppose you begin to feel cheated or at least suspicious of your partners as you have been given less than initially expected. You could be saddled with a Trojan horse syndrome, fearing that your partner might be plotting to exploit and chip away at your territory. Also, there is a technical difficulty of either quantifying or qualifying the real value of each other's merits from the alliance. This ambiguity may brew distrust in a relationship.

At the same time, frustrations could heat up to the boiling point, with neither party able to exercise its control. Nothing can be harder than shared management. Wouldn't it be difficult to boost morale and loyalty to an organization you only half-belong to? Moreover, something rapidly agreed upon could vary over time. Indeed, it takes hard work for an alliance to really operate as it should. Even within the same company, it is no easy task to have two different divisions cooperate for a common cause. The difficulty can be multiplied if companies from different countries and cultures are involved.

Nevertheless, corporate strategic alliances will be here to stay for some time because no other options seem to present better a prescription for the problems most high-tech firms are saddled with. Is the strategic alliance a passing fad like the M&A craze that we witnessed in the rolling '80s? You may as well look into a crystal ball for an answer. Whether this mode of corporate relationship will become the order of the day remains to be seen.

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