

How Important Is R&D for Asia?

By Steve Mowry

Here are three characteristics of effective R&D: First, through R&D, you extend the boundaries of knowledge by generating new products and upgrading existing technology. Research and development always results in a growth in knowledge and understanding to some degree. Second, R&D capability allows firms to better assimilate knowledge and technology developed elsewhere. Research and development is inherently an educational activity that results in improved skill levels of the participants. Third, new product development increases the opportunity for additional R&D by attracting new and more demanding customers. Marketing often uses technical information provided by R&D to indicate and tout the technology and performance level of the company's consumer electronic products. This is ever so common today on many company websites and in magazines and periodicals.

R&D BENEFITS

R&D plays a critical role in the innovation process, bringing new products and services to the marketplace. Innovation results in higher quality jobs, successful businesses, better goods and services, and more efficient processes. The positive correlation between R&D investment intensity and company performance measures such as sales growth and market share has been consistently demonstrated in many studies. Companies are typically in a better position to achieve and maintain a competitive advantage in the increasingly global consumer electronics marketplace with reasonable levels of sustained R&D.

To maximize the benefits, you should combine investment in R&D with appropriate investment in equipment, including hardware and software, market development, new processes, and other key drivers of

productivity. Perhaps the best example of this—but with regard to the US—is BOSE. Confidential sources within BOSE put R&D expenditures at approximately 25% of sales. I suspect that JBL Pro and Infinity are about the same or close to this. However, these companies are huge success stories the likes of Asia (minus Japan and South Korea) has yet to see.

Although research and development in all company sectors is of critical importance to provide a steady flow of innovative and new products and services to the marketplace, many companies expand and contract R&D efforts based on economic conditions and/or sales, slowing down activities when the economy or sales are down and speeding them up during more robust times. Conventional wisdom says that a company should invest heavily in R&D when times are good and it has extra cash to invest in its future; however, some companies use R&D to incubate ideas in the middle of an economic downturn. Apple Computer developed the iPod during the economic uncertainty of the dot-com crash. Not all companies look at R&D in such a strategic manner, but perhaps they should evaluate their business plans and models.

WORLDWIDE COMPETITION

Allowing the ever-present economic cycles to drive R&D funding and technical staff levels may be quite harmful to the research and development process, impacting the cycle of innovation and causing delays of the new product introduction and process improvements that can keep a company financially healthy. Momentum can be lost, funding can dry up, projects delayed, canceled, or closed, and customers may find alternative sources of supply. Companies that don't continually introduce innovative products or processes can be at a distinct disadvantage, losing market

share to competitors either around the block or around the world.

Globalization and the resultant competition within the CE industry have made the very survival of companies that supply CE products to the marketplace hinge on their ability to compete, not just on price but also on the quality and performance of their products. The competition within the consumer electronics industry can be described as intense. Companies must constantly seek and acquire new knowledge and know-how, while being innovative in the process. Those companies whose management has invested the most in knowledge through R&D and thus supporting their own innovation have been able to get ahead and to distinguish themselves from the followers and copycat mindset.

Unfortunately, not all consumer-electronics-related companies take advantage of the opportunities that R&D can open up. Consumer-electronics-related R&D still tends to be concentrated in the larger companies with headquarters in US, Europe, Japan, or South Korea. These companies have invested in building knowledge-intensive skills and R&D capacity, or they have purchased products from companies that have. While the phrase "innovate or perish" may be an overused figure of speech, the underlying concept is still quite accurate. Innovation, and the related investment in research and development activities across all disciplines, ultimately leads to overall economic growth and stability for the company, nation, and industry.

There is widespread agreement throughout the economic community that the future of manufacturing lies in the high tech and high value added sectors. To be successful requires innovative new products as well as new ideas about manufacturing processes that will increase effi-

ciency, reduce cost, and make companies more competitive. That, in turn, requires investment in research and development. Call it a reality check, if you like; however, consumer electronic companies need to innovate in order to get the higher margin business they need to remain competitive, profitable, and to grow.

STAFFING

Research and development also needs to be an integrated process. Some companies may understand the need for R&D, but may not have the skilled staff or knowledge in place to effectively carry out their development programs. This is where independent consultants can play a key role in support of a company's R&D efforts and in training the company's technical staff members who in turn can cross-train their peers.

The three channels most often used to gain access to new technology are hiring skilled employees, purchasing hardware and software, and using consultants. It is interesting to note that two of these three involve people. Furthermore, consultants typically have their own hardware and software engineering tools and can bring new ideas and concepts into an organization. Hiring skilled employees and retaining consultant(s) represent a cost-effective jumpstart approach to an effective R&D program. Cooperation between consultant, management, and staff is essential, and I highly recommend a concurrent approach to new product development (which I described in detail in the July/August 2004 issue of *MMM*).

The paradox of technology transfer is that the most common channel for transfer out of a company is through the mobility of skilled employees. Consultants are more project oriented in their tasks and typically sign contracts that are conditional on confidentiality for a fixed period that exceeds the carefully planned date of the new product development project(s) completion.

PATENT RIGHTS

R&D can result in valuable inventions, ideas, and designs that can be

a source of potential value when it comes to gaining competitive advantage. A variety of Intellectual Property (IP) Rights exists to help a company protect these valuable assets. For example, a patent can be used to protect products or processes that possess new functional or technical aspects. Patent rights make it illegal for an unauthorized person to profit from another's invention.

These rights are becoming more enforceable as countries realize the value of honoring and respecting contractual obligation and IP and as they target developed high margin markets in Japan and the West. I have seen several examples of increased enforcement within the legal systems of Malaysia and Thailand. As in most cases involving the transfer of technology and IP, there needs to be some reasonable controls in place to maintain structure and order within the research community. You hope that Asian countries continue in their present direction regarding this professional and/or business ethics issue of IP rights.

THE IMPORTANCE OF R&D

China is increasingly pressuring the CE industry to innovate due to their manufacturing success. Manufacturing companies in China are doing a good job of improving their quality and producing consumer electronics products, which lowers prices and forces companies to continually develop new products to gain or increase competitive advantage in their respective markets. Some Asian CE companies sacrifice R&D budgets in favor of a quarter-to-quarter focus on profits. This approach is for the nearsighted or legally blind.

Kindly be advised to take more of a long-term approach to planning and budgeting. There is a need to innovate to protect manufacturing jobs for those most vulnerable to mismanagement, and not to just focus on producing low margin OEM products. New product development and process innovation would help many companies, but there seems to be a smaller amount of top line R&D spending in China. Many obtain their

technical information directly from customers and suppliers of materials and components on materials technology and process selection or they utilize others' R&D and new product development.

Process development can be as important as product development. While there is some investment in product development R&D in Asia, the investment in process centered R&D is small. The labor-intensive environment seems to contain little incentive for manufacturing process R&D. Process contributes to a company's competitive edge. We need more focus on innovation and investment in order to advance manufacturing technology in Asia. This is important but overlooked.

Clearly, there are lessons to be learned from an "Asian experience" (living, working, and traveling in Asia for several years). Primary among them is that the right mix of public and private investment in technological upgrading of developing economies can make for an attractive location for R&D activities by globalizing consumer electronic firms. Companies which understand that research and development—whether process or product related—is a function that you can quantify, track, and analyze tend to more effectively utilize R&D activities than those companies who approach it from a haphazard point of view.

The three keys to R&D are measure, track, and monitor. Frankly, those companies who don't have a properly managed R&D plan do worse than companies that do. Once companies decide to track the yield of R&D spending and see a direct correlation between R&D and financial performance, they will be more comfortable investing in a development project.

SHINING EXAMPLE

Government programs such as Malaysia's Multimedia Super Corridor, www.msc.com.my, (MSC) initiative have been successful in attracting foreign investment from multinational Japanese, American, and European consumer electronics companies. MSC Malaysia's Research and Development

Cluster flagship program aims to position MSC Malaysia as a global hub and preferred location for innovative global R&D centers. This will also require forging collaborative R&D efforts among leading-edge companies, public research institutions, and universities. To facilitate R&D activities in MSC Malaysia, the following programs have been initiated.

1. Strategic Thrust Areas in Research (STAR)
2. MSC Malaysia R&D Grant Scheme (MGS)
3. MSC Malaysia Technology Forum Series (MTF)
4. Collaborative R&D efforts between industry, government, and universities

MSC Malaysia is a well-organized corruption-free integrated initiative that began in Kuala Lumpur and has been expanded to Bayan Lepas, Penang. It is a "shining" example of the transformation of a nation based on investment in education and R&D. I personally conducted five half-day transducer and loudspeaker training seminars in 2006 at Advanced Sound Technology, a Malaysian MSC status company within the Bayan Lepas, Penang Multimedia Super Corridor R&D Grant Scheme.

With Singapore just across the Malaysia-Singapore Second Link bridge, the model for effective intensive R&D funding with cooperative government programs is crystal clear. The Singapore government attracts world experts to Singapore through the Short Term Visit and Visiting Investigator Programs to share their knowledge and help research. The effectiveness of these R&D efforts within Singapore is simply a matter of record and a physiological but monumental victory for Asian champions of free enterprise and trade and what I refer to as the "Singapore model."

The sheer number of research and development programs is also critical to innovation within the Asian consumer electronics industry in the 21st century and the development of the economies of Asia in general, including but not limited to China, India,

Malaysia, Philippines, Vietnam, and Thailand. Manufacturing R&D is an important component of any effective R&D initiative. Ultimately, the private sector is responsible for implementing innovation in new product development and manufacturing.

And finally, effective R&D is essential to the health and growth of the Asian sector of the consumer electronics industry; the only real question that remains is who will pay for R&D or will R&D pay off for Asia? A final hint to the answer is that the cost of equivalent R&D efforts in Asia is much less than in Japan, America, Europe, or South Korea, but even that will eventually change. **MP**

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