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Design hub challenges before India

by By Pradeep Chakraborty
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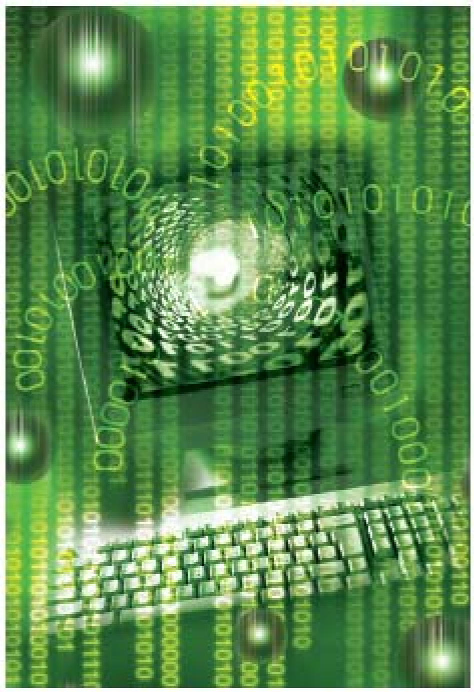

In looking at the major challenges facing India¡¯s technology industry on its path toward becoming a design hub, it should be noted that the country has the ability and experienced people to overcome these challenges, says Srini Rajam, chairman and CEO, Ittiam Systems. However, the country has yet to address the product manufacturing side. A collaborative approach is the logical way forward. The infrastructure is getting in place, so it should open the broadband market. Rajam cautions that scaling up is a problem, especially from skill sets side. ¡°To address the issue of developing skill sets, institutes are taking input from the industry to design their curriculum. Also, most of the experience in chip design is in the digital space, not analog. Analog design is very much manual, and not yet automated. Hence, our capability is a strength, though scaling up quickly and product definitions are challenges,¡±says Rajam.

Pratul Shroff, president and CEO, eInfochips, lays down four key challenges. One, the emergence of electronic products indigenously designed specifically for the Indian and regional markets. This will spur the development of product definition and architecture skills necessary for any product design activity. ¡°We need to create a strong demand-pull with a volume electronic manufacturing base for a vibrant local electronic design market,¡± he says.

Two, electronic design services companies must move up the value chain and develop ¡°whole products¡± in addition to the current focus on engineering services. Currently, most technology companies are either the captive design centers of MNCs or third-party service providers with a few IPs. Overcoming these hurdles will contribute significantly toward establishment of India¡¯s technology industry as a serious design hub.

There is a lack of product engineering capabilities such as debugging, failure analysis, and characterization arising from the weak linkages between design firms in India and Asian foundries that puts Indian companies at a disadvantage as compared to Taiwanese and Korean companies.

The fourth challenge is to generate the skilled manpower supply to support growth. ¡°Global semiconductor design is moving toward India for its skilled engineers with experience in hardware and software. It is estimated that the Indian engineering colleges currently train only about 250 to 300 VLSI engineers every year, while the actual requirement is much higher. Over the next two years, chip design services will require 20,000 additional engineers. Shortages can constraint growth,¡±cautions Shroff.

Ravi R. Pai, managing director, Softjin Infotech agrees that lack of talent is a major challenge. He says, ¡°It takes years of experience to achieve design capability because we do not have enough designers and the available quality is not adequate.

Scaling up will be an issue. Another challenge is availability of EDA tools, which are expensive. Even a training course for young engineers would be expensive. We need to sort out these issues. Next, we need to address attrition rate. The target each time is the same group of designers. They do not learn enough, but still move on.¡±

S. Surya, senior VP, Infineon Technologies, India, adds that India must position itself as a leading destination for electronic design. Electronic design services companies should be able to design and develop complete products, besides the current focus on engineering services. The government and industry associations have taken encouraging efforts to provide a sound platform and infrastructure for Indian and MNC companies to build and expand their presence in the country. Softjin¡¯s Pai also feels the lack of a market could be a challenge, though the situation has improved over the years.

Next, the per capita consumption of semiconductors in India would be very low. Though design activities would carry on, the

MNCs would be the ones developing end products.

Guru Ganesan, managing director, ARM India points out that it will be difficult to have experienced people in India. ¡°The Indian semiconductor industry in system level design is in its infancy. The industry is well aware of the potential danger regarding experienced people.¡± To address this, Atul Arora, president commercial operations, ARM India, says, ¡°We are looking at developing fresh graduates. We will be engaging in trainings and seminars, and work in schools and colleges. It is going to be a tiered program. We have packages, etc., and the students can use them. Our program is adaptable. IITs and NIITs are limited, but we will percolate it out. We will focus on the other engineering colleges as well. However, ARM cannot do it alone. This has to be a combined effort. You also need EDA tools and the EDA companies are already engaging with the various institutes in India.¡±

Focus shifts to manufacturing

The focus of work currently being done by MNCs and Indian companies are in areas of ASIC solutions and services that include advanced design and verification IP, and physical design services. Much work is also being done in embedded solutions and services, which includes reference designs, firmware IP, hardware, DSP and firmware design services. A few companies are offering application software services, including application development, system migration, QA and testing services, as

well, says Ramakrishna Dutt, managing director, Quasar Innovations.

Various design teams of MNCs in India and Indian companies are doing state-of-the-art work that is both mission-critical and cutting-edge. The industry is doing advanced SoC designs across varied domains such as WLAN, DSL, imaging and audio, wireless handsets, according to eInfochips¡¯ Shroff. Similarly, in the embedded space, high-end video and imaging devices and communications systems are being developed by the industry. There are many other companies in India that offer reference designs such as videophones, set-top boxes, audio/ MP3 players, etc., which are being licensed by large OEMs in telecom and CE spaces.

The emergence of OEMs servicing the Indian and South Asian markets with indigenous products is a first step in the direction toward establishing India as a base for volume electronics manufacturing. This will lead to growth of volume electronics manufacturing at low costs. A healthy supply of low cost components and associated services such as industrial design, certification labs, testing facilities are a prerequisite.

According to Dutt, ¡°We need to focus on creating markets for new applications in the areas of digital consumer, smart card, set-top box, etc. Electronic manufacturers such as Elcoteq, LG and Solectron already have facilities here. Some big

Taiwanese makers intend to set up contract manufacturing operations in India. The government must address infrastructure issues such as port, road and power that are critical to success of any large-scale manufacturing.¡±

Dutt says there should be an emergence of electronic products indigenously designed specifically for Indian and regional markets. ¡°A design house serves as a focal point in the ecosystem of the electronics industry. Design houses and the manufacturing industry complement each other and help the electronic design services companies in moving upward the value chain, and develop complete products apart from the current focus on engineering services. We should further concentrate on building indigenous companies dedicated to electronics design. Today, we see most technology companies are either captive design centers of MNCs or third-party service providers with a few IPs.

Vivek Sharma, head R&D sector and director, IPDF, STMicroelectronics India, adds, ¡°In the past year, we have developed 90nm foundation blocks and done advanced work in 65nm. We have developed IPs for STBs for markets in India and Mainland China. We have also developed camera chips and quite a lot of embedded software for Bluetooth and WLAN.

Fab vs. fabless

Acording to Ittiam¡¯s Rajam, going fabless is the best model for India. Venture capital is available to take care of the initial few cycles. It is an efficient capital model. Even chip companies can work on a fabless model.

Quasar¡¯s Dutt points out that fabless semiconductor companies in India are well suited to cater to the Asian OEMs. Such companies can then drive the entire industry from several perspectives—moving up the value chain, creating a market for EDA tools and other ancillary services such as packaging, testing, high speed board designs, etc.

Infineon¡¯s Surya believes that India has the opportunity to become a leading player in fabless design and could carve a niche. ¡°The need is to broaden the horizon in software engineering and project management to develop strong capabilities in embedded processors and analog signal design.¡±

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