INDIA'S IT INDUSTRY – WHAT NEXT?

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The year 1985 saw the establishment of a subsidiary in Bangalore by Texas Instruments Inc. of the US for development of software for their various needs. The 25 years that have passed since then have seen the emergence and subsequent spectacular growth of India's world-renowned IT industry. Therefore, it would not be out of place, rather, it would be extremely important, to review its present status and ponder over its future. Specifically, it would be interesting to see what this industry could potentially accomplish in the next decade, and what needs to be done in order to get there.

First, though, let us look at where we have reached. The software services segment of this industry generated a revenue of approximately US$50 billion in the fiscal year that ended in March 2010. In addition, the IT hardware segment generated a revenue of approximately US$10 billion in the same period, making a grand total of US $60 billion contributed by the Indian IT industry to India's GDP. That is approximately 6% of India's GDP, generated by approximately 2.5 million professionals that currently make up this stellar industry. If this may be considered a phenomenal performance so far, the prospects for the next decade are truly mind-boggling indeed.

It is now believed that the software industry could reach US$175 billion in revenues by 2020. Focused initiatives and innovation-led growth could lead to additional revenue and be up to US$185 billion, including domestic software sales -- a grand total of US$360 billion!

India's Electronics Hardware Industry

For a variety of reasons, some coincidental and others arising out of policy decisions and concrete actions by the government and industry, India's electronics hardware industry is poised to perform as well as its bigger sibling, the software industry -- and even better! In fact, it is estimated that with concerted action on the part of government and industry, the hardware segment could grow to somewhere between US$400 billion and US$500 billion in the next 10 years!

A combined hardware and software industry of the size of somewhere between US$750 billion and US$850 billion, that might account for anywhere between a quarter and a third of the projected total GDP of India in 2020, providing direct and indirect employment to anywhere between 30 and 50 million persons, is not impossible to achieve.

How is it all going to happen though? What would be the enabling factors? Are there any steps the government may need to take? What would industry need to do to realize this stupendous potential?

Strengths

Already, the Indian IT industry possesses several strengths that it can capitalize and build up on:

- India is already a major source for design, for many multinationals, and has now gathered a very high level of design expertise by successfully undertaking and completing many design projects in hardware as well as software development. This will stand the country in good stead in designing and developing original products and solutions for the Indian and world markets. This experience has also led to the availability of skilled professional manpower for design as well as management of development projects. However, as mentioned later in this article, the existing pool of skilled professional manpower will need to be enlarged significantly in order to cater to the demands of a rapidly growing

innovation ecosystem that is necessary to fulfill a good part of the potential for growth in the industry.

- There are the beginnings of a vibrant innovation culture, judging by the number of start-ups aiming to develop new products for the market, although we must also admit that we need many more of such start-ups. Some of these start-ups have focused on development of indigenous alternatives for India's IT product requirements -- Uniquely Indian Products for Uniquely Indian needs, which is the subject dealt with in somewhat greater detail later on in this paper.
- Today's globalized world presents an opportunity for truly Indian products to make a mark in the world market. It wouldn't be stretching the truth very far to say that the world is looking for an alternative source of affordable and high-quality IT products, so as not to have to depend only on a single source such as China. I believe that India is an excellent candidate to be one such alternative source, because of its amply-demonstrated skills in software development and its growing manufacturing capability.

  However, it would be wise for India not to simply focus on low-labour-cost manufacturing but instead focus on value addition through R&D and innovation. This will allow Indian companies to specialize in design-based manufacturing and therefore facilitate product differentiation and greater profitability so as to help catapult industry growth.
- Yet another area of potentially high growth is VLSI design. A significantly higher amount of VLSI design is already being done by a few hundred companies in India for their foreign customers including those from Finland, France, Germany, Holland, Israel, Italy, Japan, Korea, Norway, Sweden, the United Kingdom, and the United States. This experience will both help grow the contracted VLSI design business and gain expertise for future use in developing our own VLSI designs.

  Perhaps it is high time that we started designing our own VLSI chips for use in products designed for India in the first instance, and later on start marketing these as merchant ships in markets around the world. This is not as far-fetched an idea as one might think, because the establishment of a VLSI manufacturing

operation is no longer a necessity for designing unique VLSI chips which could be manufactured under contract at foundries abroad. A couple of Indian companies have already started being " fabless semiconductor companies," although the chips they sell are perhaps not in the category of VLSI chips, but the day is not far when an India-designed microprocessor, for instance, will be used and/or sold by an Indian IT company.

Needless to say, when several such companies emerge in India, there is immense potential for generating substantial revenues in both the domestic market and the international market.

The enablers

In addition to the above strengths, several enablers exist, and others need to be established or created, that could help catapult the present Indian IT industry into a much higher orbit:

- India's IT spending
- Rapidly growing domestic market
- The Indian telecom revolution
- An innovation culture
- Indians' ability to believe in themselves
- Entrepreneurial spirit
- Manufacturing competence
- Management expertise
- IT industry's desire to address geographies and domains hitherto not covered

India's IT spend

IT spending in India, in the government as well as in the private sector, has been witnessing a sharp upward growth in recent years. Large Indian corporates have already begun to outsource their entire IT activities, and a number of large

outsourcing deals have been struck in the domestic market in the recent past, with the Banking and Financial Services space and Telecom being the notable sectors. In addition, several governmental- Mission projects have been launched or announced, including the National Mission on ICT in Education, the National Telemedicine Grid, the National e-Governance Plan (NeGP), the National Rural Employment Guarantee Act (NREGA), Vision 2020 of the Indian Railways, and the modernization of India's defence forces. All of these, and others, are resulting in massive IT spends that India's IT industry would be unwise not to take advantage of.

National e-Governance Plan (NeGP}

NeGP plans to make all Government services accessible to citizens, in their localities, through common service delivery outlets, and to ensure efficiency, transparency and reliability of such services, at affordable costs, in order to fulfill the basic needs of the citizen. This is at least a US$9 billion opportunity, encompassing

- Data Centre operations / management
- Physical Infrastructure provisioning
- Hardware provisioning
- Networking
- Infrastructure for BPO operations

Both segments (hardware and software) of the Indian IT industry can and will realize very significant revenues from NeGP.

Likewise, Indian Railways' Vision 2020 plans to leverage state-of-the-art technology, in order to be more competitive and to reduce costs. This presents a large variety of opportunities to India's IT industry. Some of the killer applications to leverage such opportunities, would be:

- Ticketing Solutions (Centralised, Standalone, Mobile, Smart Card, Self Service, Internet etc.); value added services to customer
- Online and e-enabled Freight Management System
- Integrated revenue accounting system
- Train Charting and Control Systems
- RFID-based Wagon/Parcel Tracking Systems
- Integration of Railway Systems with Railway Station Systems
- Integrated Materials Management System / Fixed assets mgmt system
- Safety Systems (GPS, Embedded Systems)
- GIS-based Track Maintenance Systems

Yet another segment that will provide almost unlimited opportunities for rapid industry growth is the defence segment. On the one hand, there are many MNC defence manufacturers who have established a presence in India to benefit from the purchasing potential of the Indian defence forces who need domestic manufacturing and R&D capabilities to offset imports. Further, the Armed Forces seem to be now keener than in the past to source their requirements from the Indian private sector for reasons of both cost and confidentiality or security. This is therefore the right time for Indian IT companies to engage with the Armed Forces to develop customized solutions and products for their specific and specialized needs. The segment alone could add tens of millions of dollars, if not more, to the revenue streams of Indian IT companies.

Such new projects and activities are creating a rapidly growing domestic market which is set to grow substantially, having grown at a CAGR of 22% over the last three years. Consequently, India is expected to be the fastest growing market in the Asia Pacific, in terms of IT spending.

The ongoing Indian telecom revolution, with over 600 million telephones (which continue to grow by about 13 million subscribers every month), boasts of the lowest-cost cellular talk-time in the world -- as low as 0.33 paisa/second ($

0.007/sec)! In its wake, this revolution is giving rise to new product concepts and services opportunities.

However, in order to capitalize on the many opportunities presenting themselves as a result of all of the above, the government and industry need to recognize the potential power of intellectual property, and exploit the synergy between R&D (innovation) and Manufacturing, and thus create new markets.

Building an innovation culture in India

To build an innovation culture in India and to make India into a major Innovation hub of the world, the Indian government must:

- Allocate 2% of the national budget for funding research, to encourage Organizations to increase R&D spending, and co-invest with universities to drive research. Applied research and development should be given pride of place in this programme, and R&D funding schemes to support the entire chain of new product development from concept to prototype, all the way through to productization and initial market entry. In fact, the biggest encouragement for innovation and new product development will come from an assurance to developers/entrepreneurs that on successful completion of an R&D project sanctioned under a technology development scheme, reasonably large initial orders would be placed by a government organization for the product(s) so developed. Such support will help launch a flurry of Indian developed and manufactured products in the market.
- Create quality institutions to increase the number of PhD holders to 200,000 by 2020;
- Facilitate creation of a large talent pool of 4 to 5 million researchers, technologists and professionals for the IT hardware and software segments of the industry. This may imply bringing in educational reforms to facilitate greater private participation in high-quality educational institutions, simultaneously with the creation of an appropriate infrastructure for qualification, certification and regulation of such institutions. Obviously,

development of top-notch faculty in the appropriate numbers will also be very important.

- Facilitate professionals from industry to be adjunct faculty in higher educational institutions. This will bring in knowledge of up-to-date best practices from industry to students, which will help them become productive quickly after joining industry. At the same time, it will help bring cutting-edge research and knowledge about new techniques and technologies to such industry professionals, which would obviously foster innovation in industry. The net results would include creation of a roadmap to encourage collaboration between Industry and universities so that three or four innovation hubs would be created.
- Focus on Uniquely Indian Solutions for Uniquely Indian Needs. There are many examples of societal needs that are unique to India, and that need solutions (in the form of new products or technologies) that are uniquely Indian. Yet, once developed, such products and technologies are sure to find application in other developing economies around the world, thus creating new markets for Indian products. Examples of such uniquely Indian solutions for uniquely Indian needs include the automatic billing device in India's unique STD/ISD/PCO telephone booths, mobile phones with a built-in torchlight, local language user interfaces and SMS text facility in mobiles used in India, etc.
- The biggest example of a uniquely Indian solution for uniquely Indian needs is the new UIDAI project that aims at providing a unique identity to each person resident in India. Because of the massive size of this project that will eventually cover the entire Indian population of over 1.2 billion people, there's a great emphasis on minimizing the cost of each transaction from enrolment to verification, authentication, and authorization. Such a large-scale of unique identification has never been attempted anywhere else in the world and therefore provides India with an extraordinary opportunity to devise solutions for this task that are low-cost as well as easily scalable. Since existing products from around the world are beyond the affordability limits of this massive project.

Indian firms should jump into the fray and develop extremely cost-effective solutions for this purpose. After that, the entire world will be the market for the products so developed. Of course, the government, including UIDAI, should encourage Indian entrepreneurs to develop such solutions with an insurance of procurement of the products successfully developed and so demonstrated. What is more, the utility of these products will not end with the enrolment of the 1.2 billion Indians -- that would be only the starting point, as subsequently the UID data would be the basis for many daily transactions, all of which requiring cost-effective devices to handle and process the data.

This would be an excellent example of India becoming a laboratory for innovation for the world. Indian IT companies could similarly engage themselves in developing innovations in other areas such as energy efficiency, climate change, mobile phone applications, and clinical research, etc. In fact, now that the IT industry in India has gathered experience in many domains over the last 25 years, it is perhaps the right time for them to foray into ICT-enabled solutions in healthcare, education, financial services and public services so as to drive socio-economic inclusion of millions of citizens each year, faster, cheaper and more effective than existing or traditional models. Again, these would be uniquely Indian solutions for uniquely Indian needs that would find a ready market all over the world.

Let us think differently…

There are many innovative but small companies around the world, in the high-tech sector; likewise, there are many Indian SMEs with tremendous design capabilities and creativity. Why don't we therefore explore the possibilities of joint product development and/or joint ventures between such foreign and Indian SMEs in the high-tech sector? This would help match synergies and competence and thus facilitate creation of state-of-the-art products to help solve problems in India as well as elsewhere. Such joint ventures would then address the world market through such collaborations, instead of simply exploiting each other's markets.

Transforming India by Harnessing Technology to Enable Inclusive Growth

Specific areas of daily life in India could yield outstanding opportunities for even more uniquely Indian solutions for uniquely Indian needs -- education, healthcare, financial services, and public services. Let us examine these in detail:

Education: It is widely agreed that education can be the biggest contributor to the upliftment of the underprivileged anywhere in the world. India faces a tremendous shortage of schools, especially in rural areas, and an equally formidable shortage of quality teachers all over the country. Technology can address this through remote solutions such as remote learning, webinars, interactive videoconferencing, etc. Obviously, it is implied that all of these solutions need to be made available at very affordable costs. Of course, such solutions must also include access devices that are affordable to the rural millions including children. This is a great challenge, but once again pregnant with a huge opportunity to devise groundbreaking solutions and products that would have a huge, ready market all over the world! Imagine over 6 billion people wanting at least one such new ultra-affordable access device each -- how much larger can any opportunity be?

Furthermore, there will need to be all kinds of innovative software solutions to enable and facilitate education at a personal, individual, group, and school/college/university level, and since India has so many languages, it would be an excellent opportunity to develop local-language solutions that could then be ported to any other language anywhere else in the world -- once again, uniquely Indian solutions for uniquely Indian needs that open up markets all around the world.

Healthcare: More than half of Indians do not have access to primary healthcare, but technology can provide healthcare solutions at a fraction of the cost of traditional solutions. Opportunities for new product development, both in hardware and software, are plenty -- disease surveillance, diagnosis, telemedicine, medical records, health monitoring, and more. Once again, affordable solutions developed in India will find a huge and ready market all over the world.

Financial services: 80% of Indian households do not yet have bank accounts! That technology can enable the hundreds of millions of such Indians to access financial services is a no-brainer. However, such technology has to be affordable to both the user and the service provider, but once again, the sheer scale of the opportunity should help drive down the cost as well as make it attractive to entrepreneurs to develop technological solutions to achieve financial inclusion of all Indians. Needless to repeat, these very same solutions would then be applicable in most of the world, with appropriate language adjustments. There may also be some unique opportunities to develop solutions based on speech synthesis and speech recognition so that financial services through technology may be afforded to even those who are illiterate, anywhere in the world.

Public services: It is a well-known fact that almost half of the public food distribution in India does not reach the targeted groups. Once again, technology can ensure efficiency and transparency, but it is up to Indian technologists to develop the appropriate solutions that are affordable and accessible to both the service provider (government) and the citizen. Of course, yet again, affordable solutions developed by Indian companies would be eminently marketable all around the world.

Government to harness ICT for inclusive growth

While we have examined above the potential contributions from industry to the task of ensuring inclusive growth, we must realize that government would also have certain responsibilities in this task. Some of these are:

- Creation of a national information structure that would include ubiquitous internet connectivity, national ID (already mentioned earlier herein), and facilitation and propagation of ICT literacy.
- Collaboration with industry to develop a national blueprint for IT-enabled solutions for major public services.
- Encouraging and fostering collaboration among various government agencies as well as the private sector to create interoperable applications and standards, such as integrated hospital management systems, UID usage in various government records, and so on.

Other Avenues for Industry Growth

Having built an enviable industry size, Nasscom would of course like to find ways of growing the industry further in the coming years. Its vision is to encourage Indian IT companies to enlarge their spheres of activity to new verticals as well as new customer segments and new geographies. Among new verticals, especially in the developing countries where the Indian IT industry is already engaged, Nasscom suggests Public sector, Healthcare, Media, and Utilities as industry sectors with high potential and strongly advises its members to enter the SMB segment to grow their business and also address outsourcing markets in new geographies, especially in the BRIC nations.

As in other areas already discussed, the government will also have a significant role in promoting further growth of the IT industry, by promoting India as a trusted global hub for professional services. However, such promotion will necessitate the government's focused attention to the following areas:

- Improvement of urban infrastructure and public services in 10-15 Tier II, III cities. Perhaps this may require establishment of guidelines for and facilitation of public-private partnership(s) to help create the appropriate infrastructure in quick time.
- Effective utilization of India's diplomatic missions abroad to create global awareness in order to reposition India as a trusted sourcing hub for both software development services and hardware manufacturing as well as for sourcing innovative IT products.
- Development of a self-regulatory framework to ensure adherence to world-class standards of corporate governance and risk management.

India Team

Successfully growing the Indian IT industry to about US$850 billion in the next decade will depend largely on concerted and focused action by all the IT industry stakeholders including companies, professional bodies, government, and

academic institutions, anchored on a common multifold vision and working as a true India team to:

- Develop a high-calibre talent pool
- Catalyse growth beyond today's core markets
- Establish India as a trusted global hub for innovation and professional services
- Harness ICT for inclusive growth
- Encourage development of Uniquely Indian products/solutions for Uniquely Indian Needs,

thus holistically viewing and treating both segments -- hardware and software -- as one Indian IT industry. This will have an unparalleled impact on India's economy and society by 2020.

- effectively generating over 40 million urban employment (direct and indirect), in addition to creation of similar numbers of jobs in rural and non-metro areas, with increased diversity owing to almost equal representation for male and female workers; and
- effectively reducing the fiscal burden on government because ICT helps provide solutions at a fraction of the cost of traditional
- solutions and thus helps reduce public spend on social expenditure.

Finally, it is truly up to all of us to come together and work towards achieving the goal of 12x growth for the Indian IT industry in the next decade. It is certainly possible; we just need to have belief in our collective capability as a nation to achieve that target.

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