Int J Economics & Managment
Vol. 2 (2) July 2014 pp 69 - 79
ISSN : 2278-2478

GROWTH, PROSPECTUS AND CHALLENGES OF IT INDUSTRY IN INDIA

SHEFALI PANWAR
Assistant Professor, IEC College of Engg. & Tech, Gr. Noida.
**Corresponding Author, email : shefali_singh84@rediffmail.com*

Abstract : The Indian IT industry has received tremendous support and attention from the government, global media, venture capitalists, and technocrats. During the last 15 years, it has made remarkable achievements. Its share in India's gross domestic product (GDP) has significantly increased from 0.62 percent in 1994-95 to about 7.5 percent in 2011-12. The Industry provides over 2.77 million direct and more than 8 million indirect jobs to the India's workforce. However, currently the industry faces a number of challenges, such as, global slowdown in economic activities, low employability of IT graduates, protectionist measures adopted by some importing countries, emergence of other competitors, infrastructure constraints, rising costs of production, discontinuation of fiscal incentives and lack of a supportive policy framework. Keeping these aspects in view, this paper attempts to assess the current state of the industry and identify its future concerns. The study is based on secondary data collected from various published sources, including NASSCOM and Department of Information Technology, Government of India. The paper, among others, studies the growth trends in the gross value added, employment, and export of the industry; discusses its key challenges and provides a brief account of its future prospects. Policy initiatives taken by the government for its development have also been examined.

Keywords: Indian software industry, Economic development, IT Exports, Output Employment, GDP,

INTRODUCTION

With the incredible support and attention received from the government, the global media, venture capitalists and technocrats, the Indian IT industry has achieved phenomenal growth during the last 15 years. Its share in the India's gross domestic product (GDP) has significantly increased from 0.62 percent in 1994-95 to 4.34 percent in 2004-05 and further to 5.19 percent 2008-2009. In the financial year 2011-12, the share of the industry in the total GDP of the country was estimated to be about 7.5 percent. As far as employment generation in the industry is concerned, the number of direct jobs created by the industry has significantly increased from 0.52 million in 2001-02 to 2.77 million in 2012-12 (GOI 2012). If number of indirect jobs created by the industry is taken into account, the IT industry provides employment to more than 11 million people of the country (GOI, 2012). The industry has comparative advantage in the production and exports of IT products and services mainly due to availability of a large English speaking talent pool relatively at much cheaper wages (Arora et.al: 2001; Singh: 2002; Arora and Athreya: 2002; GOI: 2009; NASSCOM:2010 & 2012). The liberalized policy regime, fast technological advancement and declined in prices of computer hardware and fast expansion of engineering education in the areas of computer science and technology, have been emerged the key factors behind its remarkable growth. However, currently the industry faces a number of challenges such as global slowdown in economic activities, low employability of IT graduates, protectionist measures adopted by some importing countries, infrastructure constraints, rising costs of production of services, discontinuation of fiscal incentives under STPs scheme and lack of a supportive policy framework. Keeping these aspects in view, this paper examines the growth trends in the industry; and addresses its key challenges along with its future prospects.

GENESIS OF THE INDUSTRY

Although emergence of the IT industry in India is a recent phenomenon, especially after mid 1990s, its origin can be dated back to 1974 when the mainframe manufacturer, Burroughs, asked its India sales agent, Tata

Int J Economics & Managment
Vol. 2 (2) July 2014 pp 69 - 79
ISSN : 2278-2478

GROWTH, PROSPECTUS AND CHALLENGES OF IT INDUSTRY IN INDIA

SHEFALI PANWAR
Assistant Professor, IEC College of Engg. & Tech, Gr. Noida.
**Corresponding Author, email : shefali_singh84@rediffmail.com*

Abstract : The Indian IT industry has received tremendous support and attention from the government, global media, venture capitalists, and technocrats. During the last 15 years, it has made remarkable achievements. Its share in India's gross domestic product (GDP) has significantly increased from 0.62 percent in 1994-95 to about 7.5 percent in 2011-12. The Industry provides over 2.77 million direct and more than 8 million indirect jobs to the India's workforce. However, currently the industry faces a number of challenges, such as, global slowdown in economic activities, low employability of IT graduates, protectionist measures adopted by some importing countries, emergence of other competitors, infrastructure constraints, rising costs of production, discontinuation of fiscal incentives and lack of a supportive policy framework. Keeping these aspects in view, this paper attempts to assess the current state of the industry and identify its future concerns. The study is based on secondary data collected from various published sources, including NASSCOM and Department of Information Technology, Government of India. The paper, among others, studies the growth trends in the gross value added, employment, and export of the industry; discusses its key challenges and provides a brief account of its future prospects. Policy initiatives taken by the government for its development have also been examined.

Keywords: Indian software industry, Economic development, IT Exports, Output Employment, GDP,

INTRODUCTION

With the incredible support and attention received from the government, the global media, venture capitalists and technocrats, the Indian IT industry has achieved phenomenal growth during the last 15 years. Its share in the India's gross domestic product (GDP) has significantly increased from 0.62 percent in 1994-95 to 4.34 percent in 2004-05 and further to 5.19 percent 2008-2009. In the financial year 2011-12, the share of the industry in the total GDP of the country was estimated to be about 7.5 percent. As far as employment generation in the industry is concerned, the number of direct jobs created by the industry has significantly increased from 0.52 million in 2001-02 to 2.77 million in 2012-12 (GOI 2012). If number of indirect jobs created by the industry is taken into account, the IT industry provides employment to more than 11 million people of the country (GOI, 2012). The industry has comparative advantage in the production and exports of IT products and services mainly due to availability of a large English speaking talent pool relatively at much cheaper wages (Arora et.al: 2001; Singh: 2002; Arora and Athreya: 2002; GOI: 2009; NASSCOM:2010 & 2012). The liberalized policy regime, fast technological advancement and declined in prices of computer hardware and fast expansion of engineering education in the areas of computer science and technology, have been emerged the key factors behind its remarkable growth. However, currently the industry faces a number of challenges such as global slowdown in economic activities, low employability of IT graduates, protectionist measures adopted by some importing countries, infrastructure constraints, rising costs of production of services, discontinuation of fiscal incentives under STPs scheme and lack of a supportive policy framework. Keeping these aspects in view, this paper examines the growth trends in the industry; and addresses its key challenges along with its future prospects.

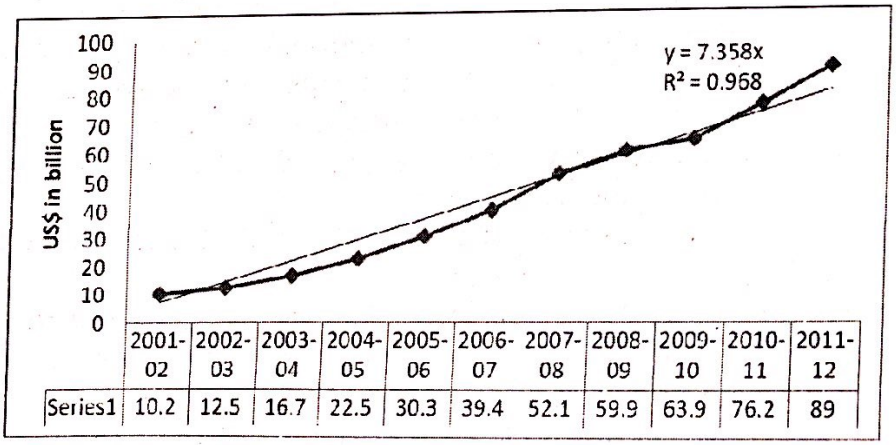
GENESIS OF THE INDUSTRY

Although emergence of the IT industry in India is a recent phenomenon, especially after mid 1990s, its origin can be dated back to 1974 when the mainframe manufacturer, Burroughs, asked its India sales agent, Tata

Consultancy Services (TCS), to export programmers for installing system software for a U.S. client (Dossani, 2005). During 1970s, domestic market for the IT products and services was almost absent and government policies toward private sector were not conducive. Indian economy was, then, state-controlled and private sector was subjected to various restrictions, including licensing. Import tariffs on computer hardware and software were quite high. Moreover, software companies were not given the industry status and as a result, software exporters were not eligible for bank finance (Dossani, 2005). Thanks to the Central Government headed by Rajiv Gandhi as Prime Minister during mid-1980s that the IT industry got policy thrust and it started evolving as a vibrant and fastest growing industry. The computer policy of 1984 explicitly acknowledged the importance of software development and underlined the need for institutional and policy support. The 1984 policy consisted of a package of reduced import tariffs on hardware and software (reduced to 60%), recognition of software exports as a "de-licensed industry", i.e., henceforth eligible for bank finance and freed from license-permit raj, permission for foreign firms to set up wholly-owned, export-dedicated units and a project to set up a chain of software technology parks that would offer infrastructure at below-market costs. In 1986, an explicit software policy was announced and software was identified as one of the key sectors on India's agenda for export promotion (Government of India, 1986). The Government of India also enacted Information Technology Act 2000 to deal with various issues related to the industry. These efforts laid the foundation for the development of a world-class IT industry in India.

TRENDS IN OUTPUT AND EMPLOYMENT

Output of the industry is aggregate revenue (sales turnover) generated through selling of IT software and services, including IT-BPO. Trends are estimated only for the last one decade as the IT sector has emerged as one of the fastest growing sectors of Indian economy since the beginning of the first decade of the twenty first century. As Figure 1 shows that total revenue generated in the IT industry has enormously increased from US$10.2 billion in 2001-02 to US$89.0 billion in 2011-12 (NASSCOM: 2012). We have also estimated the linear trend line in the revenue of the industry. The value of slope of the linear line is 7.358, which indicates that on an average, the revenue of the IT industry has increased by US$ 7.358 per annum. The value of R-square is also estimated to be quite high. Compound annual growth rate (CAGR) in the IT revenue is estimated to be 25.04 percent which is statistically significant at 1 percent level of significance. The annual growth rate in the revenue of IT industry is much higher than the overall GDP growth rate in the Indian economy during the same period.

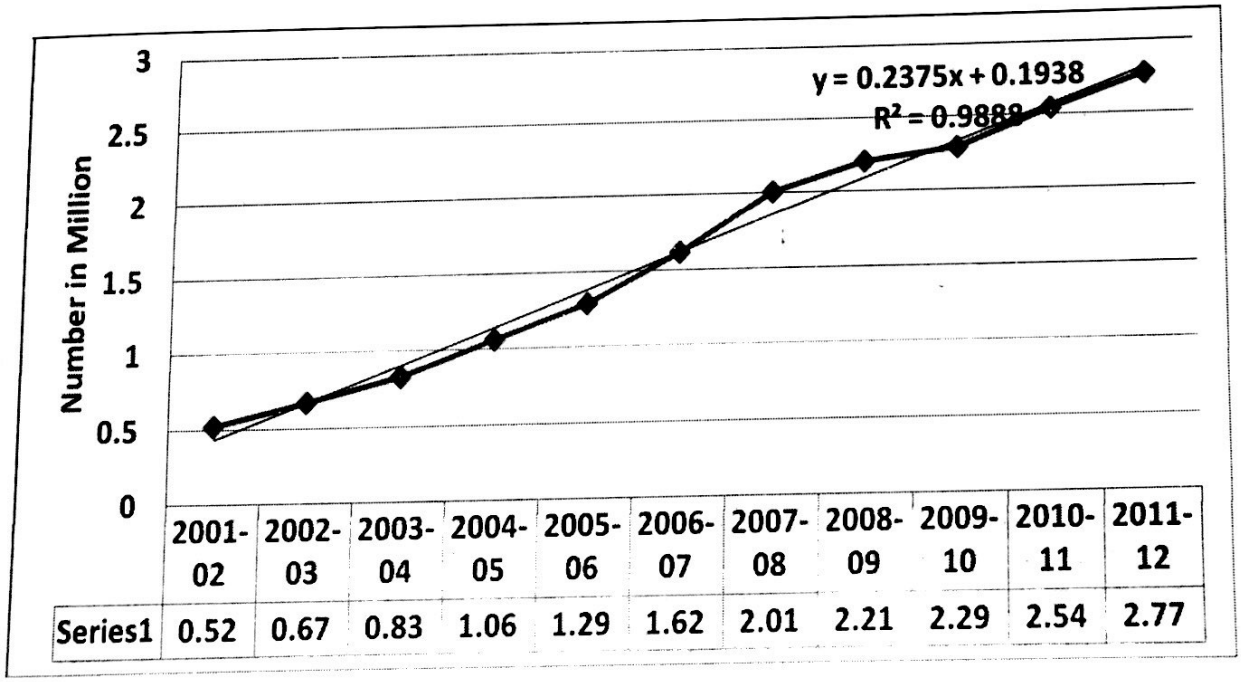


	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Series1	10.2	12.5	16.7	22.5	30.3	39.4	52.1	59.9	63.9	76.2	89

Figure 1 Trend in Revenue of Indian IT Industry (US$ Billion)

Among others, the key driving factors in the growth of Indian IT industry are: strong competitive position of the industry with high market share; huge talent pool; well established delivery centers across the world; cost and tax advantages due to government policy initiatives such as STPs and SEZs; strong growth in export demand from new verticals and the non-traditional sectors such as public sector, health, media and utilities; increasing use of new and emerging technologies; and increasing IT adoption in various sectors of domestic economy. More recently, online retailing, cloud computing, e-commerce and e-governance have become the major driving forces behind the growth of the industry. Increasing internet penetration and affordability for personal computers has led to a rapid increase in the number of Internet users in the country to reach more than 121 million, out of which 17 million are online shoppers, according to the Internet and Mobile Association of India (IAMAI). Also, E-ticketing continued to grow with irctc.com recording 5.56 million bookings in April, 2012, as compared to 2.26 million bookings in April 2011 (NASSCOM). Thus, looking at the size of domestic market and low penetration of IT and ITES, it seems that the Indian IT industry would not only have more demands of its products and services in the global market but it also has huge potential demand in the expanded domestic economy.

As far as employment generation in the industry is concerned, the number of direct jobs created by the industry has significantly increased from 0.52 million in 2001-02 to 2.21 in 2008-09 and further to 2.77 million in 2012-12 (GOI, 2012). This represents a net addition of 2.25 million to the industry employee base since 2001-02. If number of indirect jobs created by the industry is taken into consideration, the IT industry currently provides employment to more than 11 million people of the country (GOI, 2012). IT industry helps to create indirect employment to the large number of semi-skilled and unskilled workers. It is estimated that for every one job created in the industry, four additional jobs are created in the economy. Although, employment in the Indian economy has been growing at the rate of 2 to 3 percent per annum; at the same time, in the IT industry it has been growing at ra e of 18.48 percent. Figure 2 shows the employment trend in the IT sector since 2001-02.



	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Series1	0.52	0.67	0.83	1.06	1.29	1.62	2.01	2.21	2.29	2.54	2.77

Figure 2. Employment Trend in IT Industry (Numbers in million)

If we look at the segment-wise employment in the industry, we find that exports of IT services constitute the highest share in the total employment generation in the industry. It is followed by IT-BPO export and domestic market. IT and ITES export has been the major source of employment in this industry and its share has increased from 52.9 percent in 2001-02 to 77.6 percent in 2008-09; whereas the share of domestic market in total employment of the IT Software and Services Industry has declined from 47.1 percent in 2001-02 to 22.6 percent in 2008-09. Table 1 shows that number of jobs created in the IT and ITES export sector has increased from 0.17 million in 2001-02 to 0.92 in 2008-09. In IT-BPO export sector, the number of jobs went up from 0.11 million in 2001-02 to 0.79 million in 2008-09. As far as jobs in the domestic market are concerned, Table 4 shows that these jobs have gone up from 0.25 million in 2001-02 to 0.50 million in 2008-09. The estimated CAGRs show that IT-BPO export sector recorded the highest growth (32.46%) in the employment during the period 2001-02 to 2008-09. It is followed by the IT and ITES export (29.38%). The lowest growth in the employment is observed in the domestic market (9.53%). Overall, employment in the industry grew at a CAGR of 23.64 percent during the eight-year period.

Table 1: Employment Trends in IT Industry (in millions)

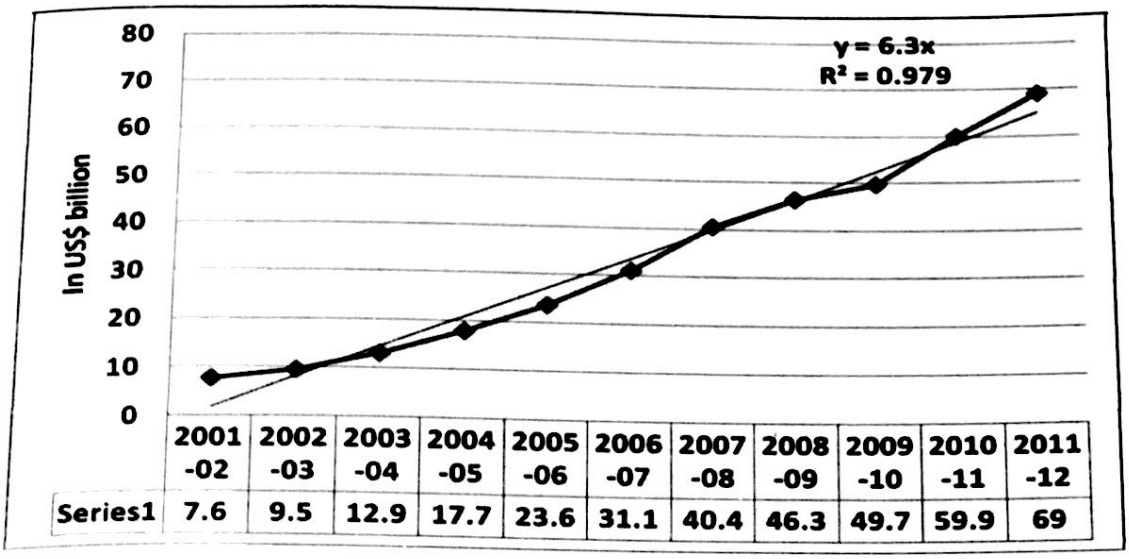
Year	IT and ITES Export	BPO Exports	Domestic Market	Total
2001-02	0.17	0.11	0.25	0.52
2002-03	0.21	0.18	0.29	0.67
2003-04	0.30	0.22	0.32	0.83
2004-05	0.39	0.32	0.35	1.06
2005-06	0.51	0.42	0.38	1.29
2006-07	0.69	0.55	0.38	1.62
2007-08	0.86	0.7	0.45	2.01
2008-09	0.92	0.79	0.50	2.21
CAGR	29.38*	32.46*	9.53*	23.64*

* Significant at 1% level of significance
Source: http://www.mit.gov.in/content/employment

EXPORT TRENDS IN THE IT INDUSTRY

The most significant contribution of IT industry in the Indian economy is the foreign exchange earnings through export of IT software and services. The foreign exchange earnings of the IT sector are one of the key sources for reducing the trade deficit. The current account deficit (CAD) would have been much higher if the IT industry did not generate foreign exchange in the invisible head of the current account. The foreign exchange earnings of the IT industry have substantially increased from US$ 7.6 billion in 2001-01 to US$28.6 billion in 2008-09 and further to US$ 68.7 billion in 2011-12 (GOI, 2012).

Figure 3 shows that total export revenue of the IT industry has remarkably increased from US$ 7.6 billion in 2001-02 to US$ 23.6 billion in 2005-06 and further to US$69.0 billion in 2011-12. We have also estimated the linear trend line in the export revenue. The value of slope of the linear line is 6.3, which indicates that on an average, export earnings of the industry has increased by US$ 6.3 billion per annum. The value R-square is also estimated to be quite high. It may also be mentioned here that about 75 percent of total sales turnover of the industry comes through export of software and IT services.



	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Series1	7.6	9.5	12.9	17.7	23.6	31.1	40.4	46.3	49.7	59.9	69

Figure 3. Trend in Export Revenue of IT Industry (US$ Billion)

Segment-wise trends in export earnings of the IT sector are also estimated. Table 5 shows that IT services constitute the largest share of total export of IT industry, distantly followed by IT-BPO and software products /engineering services. Export of IT services has increased from US$5.8 billion in 2001-02 to US$13.3 billion in 2005-06 and further to US$40.0 billion in 2011-12. Thus, during the entire period under study, export of IT services grew more than 7 times. In case of export revenue of IT-BPO, the value has increased from US$ 1.5 million in 2001-02 to US$6.3 billion in 2005-06 and further to US$ 16.0 billion, thus registering a 10-fold increase during the entire period. As far as export revenue from software products /engineering services are concerned, Table 2 reveals that it has gone up from US$ 0.3 billion in 2001-02 to US$4.0 billion in 2005-06 and further to US$ 13.0 billion in 2011-12.

Estimated CAGRs show that export of software products/engineering services has recorded the highest growth (35.28%) during

Table 2: Segment-wise Trends in Export Revenue of IT Industry (in US$ billion)

Year	IT Services	BPO	Software products/Engineering	Total
2001-02	5.8	1.5	0.3	7.6
2002-03	5.5	2.5	1.5	9.5
2003-04	7.3	3.1	2.5	12.9
2004-05	10.0	4.6	3.1	17.7
2005-06	13.3	6.3	4.0	23.6
2006-07	17.8	8.4	4.9	31.1
2007-08	23.1	10.9	6.4	40.4
2008-09	26.5	12.7	7.1	46.3
2009-10	27.3	12.4	10.0	49.7
2010-11	35.5	14.1	11.4	59.9
2011-12	40.0	16.0	13.0	69.0
CAGR	23.90*	26.08*	35.28*	25.41*

* Significant at 1% level of significance.
Sources: Official Website of NASSCOM

the last 11 years. It is followed by IT-BPO (26.08%). The lowest growth is observed in the export of IT services. Overall, export revenue of the IT industry has increased at the CAGR of 25.41 percent. Growth rates in all the segments are found statistically significant at 1 percent level of significance. Thus, export revenue of the IT industry, measured in US dollar, has shown remarkable growth during the first decade of 21st century.

As far as export destination is concerned, it is observed that USA continues to be the major market for the Indian IT software and services exports. However the share of USA has declined from 68.3 percent in 2004-05 to 61 percent in 2009-10, whereas that of Europe, including UK, has increased from 23.1 per cent to 30 percent over the same period. Percentage share of rest of the world has marginally increased from 8.60 percent to 9.0 during the same period. This clearly shows that growth of IT industry largely depends on the export demands made by the USA and European countries, including UK.

GOVERNMENT INITIATIVES

The liberalization of the Indian economy in the early nineties has played a key role in the growth of the IT industry. The Economic reform measures, which include trade liberalization, elimination of duties on imports of IT products, relaxation of controls on FDIs and foreign exchange and the fiscal incentives, have been major contributory factors for the emergence of this industry. Government of India set up Software Technology Parks (STPs) and Special Economic Zones (SEZs) for the promotion of the industry. Software Technology Parks of India (STPI) was set up in 1991 as an Autonomous Society under the Department of Electronics and Information Technology for boosting the software products and services. The scheme is a 100% export-oriented and is meant for undertaking of software development for export using data communication links. The scheme allows software companies to set up operations in most convenient and cheapest locations and plan their investment and growth driven by business needs. STPI has played a key role in the promotion of software exports with a special focus on SMEs and start up units. Since, the inception of the scheme, 52 STPI centres have been set up for the purpose of increasing the export of IT and ITES. Out of these 52 centres, 45 are in Tier II and Tier III cities (Annual Report of STPI, 2010-11). The major incentives provided to the IT companies under the scheme are: exemption from customs duty on import of computer hardware and other IT products; exemptions from service tax, excise duty, and rebate for payment of central sales tax; 100 percent exemption from income tax of export profits till 31st March 2011; 100% FDI through automatic route; etc. The scheme is spread all over India and more than 8000 units have been registered under STP scheme. However, in view of the withdrawal of tax benefits for the STP units, the STPI ha: to evolve a new strategy and road map for further development of the IT sector.

Another scheme that benefits the IT industry is SEZ, which was set up by the Ministry of Commerce, Government of India with an objective of providing an internationally competitive and hassle free environment for exports. A SEZ is defined as a "specifically demarked duty-free enclave and shall deemed to be foreign territory (out of customs jurisdiction) for the purpose of trade operations and duties and tariffs". The SEZ Act, 2005 came into effect on 10th February, 2006. The SEZ offers similar benefits to SEZ units as compared to those under STPI in respect of indirect taxes, with some minor differences in operational details. There is, however, a significant difference, in respect of income tax exemption. In SEZ scheme, the exemption of export profits from income tax is 100% for the first five years, 50% for the next five years and 50% for another five years subject to transfer of profits to special reserves. These two schemes have helped to boost the growth of the IT sector of India.

Apart from these initiatives, the Central and the State Governments have also taken several other steps which directly or indirectly facilitate the growth of IT industry. Investment made by the government on various e-governance projects, including 'Aadhaar' and digitalization of databases of government ministries, expansion of IT services in rural areas, etc. have provided impetus to the domestic market of the IT industry. The Indian government has also established a National Taskforce on IT with an aim of formulation of a durable National IT Policy for India (GOI: 2009). The 12th Plan also focuses on the development of the IT industry. The Department of Information Technology proposes to strengthen and extend the existing core infrastructure projects, including fibre optic based connectivity and setting up additional 150,000 Common Service Centres (CSCs) to create the good governance and service delivery ecosystem at the Panchayat level (GOI, 2012). Report of Working Group constituted by the Planning Commission (GOI: undated) for IT Industry under the 12th Plan also emphasizes on promotion of e-governance, e-learning, e-security, e-industry, etc. The National e-Governance Plan with a vision to make all government services accessible to the common man in his locality, through common service delivery outlets, and ensure efficiency, transparency, and reliability of such services at affordable costs is an important initiative to be taken by the Government of India. In the area of education, e-learning initiative would provide cost effective and flexible system of delivery of education. Cyber security threats pose one of the most serious economic and national security challenges. Government initiatives in this direction would also provide additional opportunities to the IT companies. The key strategies under the Plan are to create an enabling policy environment for making IT industry a leader in developed and emerging markets; support SMEs through fiscal incentives and innovations; build world class infrastructure in identified Tier II and Tier III cities to create potential centres of excellence; and reduce the employability gap through skill development initiatives. It is hoped that all these initiatives would further boost the output, employment and export growth in the IT industry.

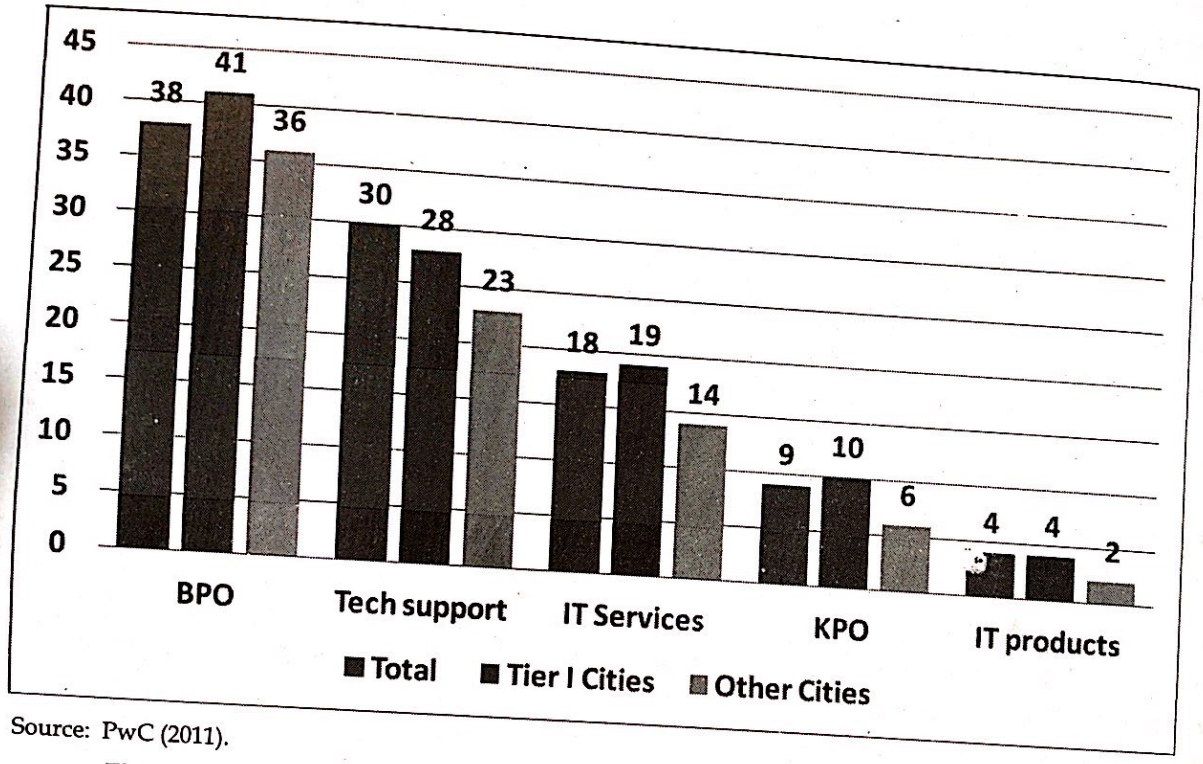
CHALLENGES BEFORE THE INDUSTRY

In the changing global scenario, the Indian IT industry has been facing number of challenges. Although, the industry continues to remain a major player in the global IT outsourcing market, over the period, some new players, such as China, Philippines, Vietnam, Poland, Hungary, Mexico, Brazil, Egypt, etc., have also entered in the global IT outsourcing market. Many of these countries are offering a number of incentives to attract global players to set-up operations in their countries. The attractive incentives offered by these countries to the IT companies have encouraged MNCs and Indian companies to set up their units in these countries. The Chinese government has initiated several schemes to promote R&D activities and building talent pool through investing more in education and skill formation. Another challenge before the Indian IT industry is that since the IT companies are relatively less capital intensive and more flexible in their operations, these companies can easily be relocated in a very short time to those countries which provide better infrastructure, policy environment and fiscal incentives. Therefore, if competitiveness of the Indian IT industry is to be kept maintaining, this potential challenge needs to be given a serious thought.

Declining competitiveness of the Industry also seems to be a challenge. Cost of producing IT products and services is rising mainly due to inefficiencies in various infrastructural facilities such as power, transport, security; high real estate prices in the metros; and inadequate infrastructure in Tier II and Tier III cities Due to inadequacy of public infrastructure, the IT companies have

invested in world class facilities, extensive talent development initiatives, disaster recovery and business continuity, high cost of transport, enhanced security, captive power generation, UPS and other equipments which have overall created a cost disadvantage of 10 –15% as compared to other emerging markets.

Employability of majority of computer software and IT graduates is the major problem. According to NASSCOM that about 25 percent of technical graduates and 10-15 percent of other graduates are found suitable for the employment in the growing IT and ITES companies. Consequently, the effective pool of employable graduates is far lower than the overall pool of people entering the working-age population. A study conducted by *Aspiring Minds* (quoted in PwC study on changing landscape and emerging trends: Indian IT/ITES Industry), shows that the employability rate with regard to BPOs and technical support jobs is 38% and 30% respectively. For the IT services companies, it is about 18%. For the knowledge process outsourcing (KPO) companies, only 9.0% of the technical graduates are employable. The employability rate for the product companies drops to a low of 4% in the IT products (Figure 4). The Figure demonstrates that employability of graduates is higher in Tier I cities as compared to other cities in all sub-sectors of the IT industry.



Source: PwC (2011).

Figure 4. Employability in Various IT Sub sectors in Tier 1 and other Cities (in %)

Growth of the Indian IT industry largely depends on the export which has become more volatile due to global economic and financial crisis. USA and UK account for about 75-80 percent of the total export earnings of the industry. The financial crisis in USA and resultantly protectionist policy measures adopted by the USA government has adversely affected the Indian IT industry. Some European countries have also adopted the protectionist measures against the outsourcing.

Although the Indian IT industry is a global leader in the outsourcing business, it lacks original technological development and relies

mainly on the imported technology. A study by Chakraborty and Dutta (2002) identifies inadequate R&D investment, poor regulatory framework and lack of a sizable domestic market as the key constraints in the future development of the industry. Arora and Athreye (2002) also raise the doubt about the sustainability of the current export led growth in the industry without a vibrant domestic market. Therefore, technological innovation is necessary for improving the efficiency and productivity in the industry and maintaining its global leadership. Agrawal and Thite (2003) conducted in-depth interviews of stakeholders from Indian software organizations and found that the industry is facing many challenges, such as high rate of voluntary employee turnover; reluctance of professionals to make a transition from a technical to managerial position; lack of basic managerial and leadership skills; and work and learning preferences of software professionals that remain unmet.

In nutshell, low employability of IT graduates, protectionist policy measures adopted by USA and some other countries, infrastructure constraints, rising costs of production of services, discontinuation of fiscal incentives under STPs scheme and lack of a supportive policy framework are the key challenges before the industry.

FUTURE OF THE IT INDUSTRY

It is generally accepted that India's success in the IT sector is due to the software industry's knowledge and expertise in cutting-edge technologies and its large base of skilled manpower. Both these strengths are likely to contribute to the industry's future growth. Wage costs in India are estimated about 1/3rd to 1/5th of the corresponding US levels for comparable work. In most of the countries, especially in advanced ones, number of aging persons is rising, while in India, proportion of young population has been rising over the period. This demographic dividend would provide additional opportunities to the IT sector. These young people will not only consume more IT products and services and fuel the domestic market but also be the potential source of supply of low cost trained IT manpower for the industry. Apart from creating more number of IITs and NITs, the government has established several Indian Institutes of Information Technology, exclusively for the requirement of the IT industry. Private sector is also taking lead in opening up engineering institutes to cater to the manpower need of the software and IT companies.

The brand equity that the Indian IT industry has made in the global market over the period will have an edge over the other competitors in the global market. The proliferation of IT and ITES and their continuing demand-led growth may well emerge to be a strong opportunity for India, both in terms of generating employment and export. Informal sector will also provide more opportunities to the industry in the areas of retail and wholesale trade, computer training, maintenance and repair, web design, desktop publishing, Internet cafes, web-based research, journalism, coaching centers, software development, etc. The increasing use of computers as an educational tool, rise in e-governance projects, and increasing demand of computers by households, small businesses, self-employed persons such as lawyers, doctors, architects, CAs, teachers, wholesalers, retailers, traders, transporters, etc would generate income and employment opportunites. Education and healthcare in rural areas are still a thrust area where IT can play a vital role to link the rural areas with advanced city life style. The domestic IT market, still in a nascent stage, is expected to witness substantial growth in future.

During the last 15 years, growth of the industry has largely driven by the external demand in the verticals like manufacturing, telecom, education, insurance, banking, finance and lately the retail. Now doubt, demands will continue to be made by these verticals, however future demand of the

industry will be extended to some other emerging areas such as climate change, healthcare, energy efficiency, automobile, e-governance, sustainable energy, agriculture and rural development. With the future growth in educational institutions, healthcare infrastructure, transport and communication, socio-economic and physical infrastructure and digitalization and computerization of government ministries and organizations, and household demands for personal computers/laptops with internet services, the industry get further impetus. Keeping in view the huge size of the country in terms of population and aggregate GDP, the future of the IT industry in the domestic market also appears to be quite bright. Availability of low cost skilled manpower and the cutting-edge technologies are the key strengths of the industry which are expected to continue in future too. However, in order to retain talent, the industry should focus on three key areas—imparting professional training, offering competitive reward and employee empowerment (PcW: 2011).

CONCLUSION

Indian IT sector has made significant contribution to the GDP, employment generation, export earnings, poverty reduction, economic globalization, and women empowerment. It has not only helped in improving the delivery of public services through e-governance but also promoted socio-cultural development and the concept of global village and borderless society. The liberalized policy regime, fast technological advancement and declined in prices of computer hardware and fast expansion of engineering education in the areas of computer science and technology have been the driving factors in the spectacular performance of the industry. However, low employability, protectionist policies adopted by several countries, including USA, infrastructure constraints, rising costs of production of services, discontinuation of fiscal incentives under STP scheme and lack of a supportive policy framework and an innovation ecosystem are considered the main concerns in context of future growth of the industry.

Emphasis of the government and the industry should be on: strengthening of existing IT infrastructure; creation of more enabling and conducive policy environment; improving the employability of prospective employees through effective industry-academia interaction and designing the curricula suited to the changing need of the industry; Above all, there is a need to create vibrant domestic IT market to supplement export and insulate the industry from the volatile global market. Appropriate policy interventions are required to promote the diffusion of IT into various sectors and sub-sectors of the domestic economy. Growth of the Indian software industry largely depends on the imported hardware which is putting more pressure on the foreign exchange. To accelerate and sustain the growth of the industry, investment in hardware infrastr-ucture and technical education is required to be enhanced so that dependence on imported hardware may be reduced and the employability of manpower be improved.

REFERENCES

Agrawal, N. M., and Thite, M. (2003), "Human Resource Issues, Challenges and Strategies in the Indian Software Industry", International Journal of Human Resources Development and Management, Vol. 3(3), pp. 249–264.

Arora A., Arunachalam V.S., Asundi J. and Ronald F. (2001), "The Indian Software Services Industry", Research Policy, Vol. 30 (3), pp 1267-87.

Arora A and Athreya S. (2002), "The Software Industry and India's Economic Development", Information Economics and Policy, Vol. 14, 2002, pp 25-273

Dossani, R. (2005), "Origins and Growth of the Software Industry in India", http://iis-db.stansord.edu/ pubs/20973 /Dossani_India_IT_2005.p

Government of India (1986), Policy on Computer Software Export, Software Development and Training, Department of Electronics, New Delhi.

Government of India (2009), Report of Task Force to Suggest Measures to Stimulate the Growth of IT, ITES and Electronics Hardware Manufacturing Industry in India, Department of Information Technology, New Delhi.

Government of India (2010), Value Addition & Employment Generation in the ICT Sector in India, CSO, New Delhi.

Government of India (undated), Report of the Working Group on Information Technology Sector Twelfth Five Year Plan (2012 -17), Ministry of Communications and Information Technology, Department of Information Technology, New Delhi.

Government of India (2012), Electronics and Information Technology: Annual Report 2011-12, Ministry of Communications and Information Technology, Department of Information Technology, New Delhi.

NASSCOM (2012) "IT-BPO Sector in India- Strategic Review 2012", Executive Summary,

Nasscom (2010), "Impact of the IT-BPO Industry in India: A Decade in Review", Executive Summary.

NASSCOM. (2011). NASSCOM Strategic Review Available at http:// www. nasscom.in/upload/Publications/Research/140211/Executive_Summary.pdf

PcW (2011), Changing Landscape and Emerging Trends: Indian IT/ITeS Industry, PricewaterhouseCoopers Private Limited. Available at: http://www.pwc.com/en_IN/in/assets/pdfs /publications-2011/Indian_IT-ITeS_Industry_-_Changing_ Landscape _and_emerging_trends.pdf

Singh, N. (2002), "Information Technology and India's Economic Development", UC Santa Cruz Economics Working Paper No. 523. Available at SSRN: http://ssrn.com/abstract=345940 or http://dx.doi.org/10.2139/ssrn.345940

STPI (2011), Annual Report 2010-11, Software Technology Parks of India,