



CONTRIBUTION OF INFORMATION TECHNOLOGY AND GROWTH OF INDIAN ECONOMY

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Abstract

Information technology is an important emerging sector of the Indian economy. The Government of India has identified IT industry as one of the major industries in India and it plays an important role in achieving the policy objectives like economic development. The IT industry has mellowed over the years and has emerged to be a chief contributor to the global economic growth. The IT sector, constituted by the software and services, Information Technology Enabled Services (ITES) and the hardware segments, has been on a gradual growth trajectory with a steady rise in revenues as witnessed in the past few years. The size of this sector has increased at a rate of 35% per year during the last 10 years. The share of information technology industry is 7 percent of gross domestic product (GDP) in Indian economy according to NASSCOM (www.imdr.edu; www.nasscom.org). The prime aim of this paper is to analyze the growth and performance of information technology industry in India. This paper examines the question: How information technology contributes to India's economic development in a holistic and broader way

Keywords: IT-ITES, Contribution to GDP, Employment, Export and Revenue

Today's escalating, competitive and demanding environments have forced companies to be more efficient, operate leaner and continuously create new procedures to keep ahead of competitors - adding final consumer value to a product or service in the form of lower prices, quality and better service has become an essential requirement in the global marketplace. Corporations are trying to adapt with increasing competitors' innovations to find global opportunities and resources, focusing on core competencies and mutually constructive relationships, and finally, outsourcing those activities which can be performed more quickly and at lower costs by subcontractors. In a globally integrated economy, outsourcing is leading to overall benefits for the source economies, providing weighty monetary and employment benefits. India has become a target destination for multinationals to back end their IT operations in India owing to its strong value proposition. The possibilities for broad-based IT-led economic growth in India, includes increasing value-added, using better telecom links to capture more benefits domestically through offshore development for developed country firms, greater spillovers to the local economy, broadening the IT industry with production of telecom access devices, improving the functioning of the economy through a more extensive and denser communications network, and improving governance. Information technology essentially refers to the digital processing, storage and communication of information of all kinds. Therefore, IT can potentially be used in every sector of the economy. The true impact of IT on growth and productivity continues to be a matter of debate, in the India, which have been the leader and adopter of IT. IT has contributed significantly to total factor productivity growth (TFPG), of course, higher TFPG implies higher overall growth, ceteris paribus. However, there is no doubt that the IT sector has been a vibrant one in many developed countries, and India has stood out

as a developing country where IT, in the semblance of software exports, has grown dramatically, despite the country's relatively low level of income and development. An example of IT's broader impact comes from the case of so-called IT-enabled services, a broad category covering many different kinds of data processing and voice interactions that use some IT infrastructure as inputs, but do not necessarily involve the production of IT outputs. This paper consider directly by examining the performance of India's IT sector, explore the trends of contribution of IT industry in the total GDP, analyze the revenue trends of IT industry in the total revenue, the growth pattern of the software industry and software exports, the rapid emergence of IT-enabled services and the role of the domestic market and to divulge the employment level of IT industry of India.

Role of Information Technology on Indian Economy:

The Indian IT industry has grown almost tenfold in previous decade. Domestic software has grown at 46 per cent while software exports have grown at 62 per cent over the last 5 years. Information Technology enabled services (ITes) with elements like call centres, back office processing, contents development and medical transcription are key to rapid growth. The sector has an employment potential of 2 million by 2010. All this shows the significant contribution of software industry to Indian economy in terms of GDP and as an employment provider. India's concentration in software has been driven by two sorts of wage advantages that have reinforced each other as such the lower wages for Indian software developers relative to that of their US and European counterparts make Indian software cheaper in global markets, and while the higher wages earned by software professionals in India relative to that in other industrial sectors has ensured a steady stream of supply of software professionals. India's over aching



objective remains vitally one of accelerating economic growth and reducing widespread poverty. To effectively reduce poverty, the pattern of economic growth would need to be broad-based so as to bring about social development and improvements in the welfare of Indian peoples. To this end, priority should be bestowed to investing in physical as well as human capital, especially with respect to access to education, health and nutrition. It is also important to promote private-sector led growth and international trade. Furthermore, efforts would be needed to attend to cross-cutting issues such as environmental management. In a nutshell, India's quest for sustainable development should be based on the pursuit of the intertwined goals of accelerating the pace of economic growth, while also spreading the benefits widely among the population so as to make significant strides in poverty reduction. The Indian Information Technology and Information Technology Enabled Services (IT-ITES) industry has been contributing its role in the economic development of India since post liberalization era. The IT-ITES industry in India has today become a growth engine for the economy, contributing substantially to increases in the GDP, urban employment and exports, to achieve the vision of a powerful and resilient India. While the Indian economy has been impacted by the global slowdown, the IT-ITES industry has displayed resilience and tenacity in countering the unpredictable conditions and reiterating the viability of India's fundamental value proposition. The rapid growth of ITES-BPO and the IT industry as a whole has made a deep impact on the socioeconomic dynamics of the country, having a significant multiplier effect on the Indian economy. Apart from the direct impact on national income, the sector has risen to become the biggest employment generator with the number of jobs added almost doubling each year, has spawned a number of ancillary businesses such as transportation, real estate and catering; played a key role in the rise in direct-tax collection and has contributed to a rising class of young consumers with high disposable incomes. The pace growth of this industry is considered as a growth driver for the economy. India has become as "IT Super Power". The performance of IT industry can be revealed with the evidence of its contribution to the GDP (Gross Domestic Product) of the country, provision of employment opportunities all over the country, IT services and software exports and revenue to the country. This paper examines how does the IT industry is playing its predominant role in Indian economy with its various trends in the contribution to the GDP of India, IT exports, IT revenue trends and employment opportunities.

Growth and Performance of Information Technology Industry in India: The contribution of India's IT industry to economic progress has been quite significant. The rapidly expanding socio economic infrastructure has proved to be of great use in supporting the growth of Indian information technology industry. Information Technology

(IT), a knowledge-based industry, has the tremendous potential of becoming an engine of accelerated economic growth, productivity improvement for all sectors of the economy and means of efficient governance. It enhances access to information, protects consumers, provides access to government services, makes skill formation and training more effective, improves delivery health services, and promotes transparency. It provides tremendous employment potential and linkages between government and the people both at the rural and urban level. Investment in knowledge based industries will determine the level of the country's dominant position in the world economy in the next two decades. The information technology industry has emerged as one of the fastest growing industries in India. As a proportion of Gross Domestic Product, the information technology industry revenue has grown from 1.2 percent in 1998 to an estimated 5.8 percent in 2009. India's domestic market is estimated to grow by 20 percent growth in 2008-09. Hardware segment is estimated to grow by 17 percent to be Rs.541 billion, information technology services segment is estimated to grow by 20 percent to be Rs.380 billion. Whereas software products and BPO segment is estimated to grow by 15 percent to be Rs.103.3 billion. Export growth is expected at 16-17 percent in 2008-09. Industry will continue to net hire and focus on value creation, provide direct employment to 2.23 million and indirect job creation estimated to eight million employees. Indian information technology sector is developing as the biggest source of revenue and employment generator. The growth of information technology industry will also develop the other industries of the economy. This industry has a number of customers in India, as well as also in abroad. The growth and prosperity of India's IT industry depends on some crucial factors. These factors are as follows:

India is home to a large number of IT professionals, who have the necessary skill and expertise to meet the demands and expectations of the global IT industry.

The cost of skilled Indian workforce is reasonably low compared to the developed nations. This makes the Indian IT services highly cost efficient and this is also the reason as to why the IT enabled services like business process outsourcing and knowledge process outsourcing have expanded significantly in the Indian job market.

India has a huge pool of English-speaking IT professionals. This is why the English-speaking countries like the US and the UK depend on the Indian IT industry for outsourcing their business processes.

India's GDP and Information Technology Industry Growth: Indian information technology industry has grown manifold during the period 1997-98 to 2007-08 as shown in table 1. The size of Indian information technology industry has increased from USD 5.0 billion in 1997-98 to USD 64.0 billion in 2007-08. The share of information technology industry in Gross Domestic Product has increased from



1.2 percent in 1997-98 to 5.2 percent in 2007-08. This sector is expected to reach USD 73.1 billion in FY2010, an aggregate growth of 5.4%. Thus, information technology industry is considered as a key industry for the development of Indian economy.

Table 1 - India's GDP and Information Technology Industry Growth

Years	GDP Growth (USD Billion)	IT Growth (USD Billion)	%age share of IT Industry in GDP
1997-98	411.570	5.0	1.2
1998-99	440.597	6.0	1.4
1999-00	461.914	8.2	1.8
2000-01	473.050	12.1	2.6
2001-02	494.997	13.4	2.7
2002-03	573.167	16.1	2.8
2003-04	669.442	21.5	3.2
2004-05	783.141	28.2	3.6
2005-06	877.224	37.4	4.3
2006-07	1098.945	47.8	4.3
2007-08	1232.946	64.0	5.2
2008-09	1150.0	69.4	6.0
2009-10	1198.36	73.1	6.1

Source: <http://mospi.nic.in> and <http://www.nasscom.org>

Note: GDP figures are at market prices.

The global recession has significantly impacted technology spending levels across the world, raising several demand side challenges for the Indian IT-BPO sector. However, the industry has displayed resilience, enhanced efficiencies, invested in future growth plans along disruptive technologies and changed existing business model.

Revenue

The IT-ITeS industry has been growing at an outstanding pace since 2001-02. The total IT-ITeS exports and domestic industry revenue is estimated at US \$ 10.2 billion in 2001-02. It has reached to US \$58.7 billion in 2008-09, the CAGR of about 26.9 percent. Export revenues of IT and BPO services (excluding hardware exports) in FY2010 are expected to grow by 5.5%.

Table 2

Year/Item	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	CAGR (%)
IT-ITeS Exports	7.6	9.5	12.9	17.7	23.6	31.1	40.4	46.3	28.6
IT-ITeS Domestic	2.6	3.0	3.8	4.8	6.7	8.2	11.7	12.4	22.2
Total (US \$billion)	10.2	12.5	16.7	22.5	30.3	39.3	52.0	58.7	26.9

Source: <http://www.nasscom.org>

Growth of Software and Services Industry in Indian Domestic and Foreign Market: Information technology industry caters both the domestic as well as foreign market. But it is the software and services sector which has made impressive growth in the foreign as well as domestic market. Table 3 conveys that the size of IT software and services sector in domestic market in 1999 was just USD 1.7 billion, which has increased to USD 12.5 billion in 2009. The sector of software products and engineering services is dominating in its domestic revenue, but the percentage share

of domestic market has declined from 39.5 percent in 1999 to 21 percent in 2009. The exports of IT industry have grown year by year since 2001. The foreign market of software and services sector has grown rapidly. The share of IT-ITeS exports to total IT-ITeS revenue of Indian Software and Services industry have contributed from 74.5% in 2001-02 to 78.9% in 2008-09. The decline in the share of domestic market is due to foreign market's expansion and less absorption capacity of Indian economy for information technology services. While India has been able to establish arena, yet India has not been able to make a dent in the software product market. In spite of all this, Indian total information technology market has increased from USD 4.3 billion in 1999 to USD 59.5 billion in 2009, which is itself an achievement.

Table 3 - Growth of Software and Services Industry in Indian Domestic and Foreign Market

Years	Domestic MKT. (USD bn.)	Percentage Growth	Foreign MKT. (USD bn.)	Percentage Growth	Total IT MKT. (USD bn.)
1999	1.7 (39.5)	-	2.6 (60.5)	-	4.3
2000	1.9 (32.2)	11.8	4.0 (67.8)	53.8	5.9
2001	2.5 (28.7)	31.6	6.2 (71.3)	55.0	8.7
2002	2.6 (25.2)	4.00	7.7 (74.8)	24.2	10.3
2003	3.0 (23.8)	15.4	9.6 (76.2)	24.7	12.6
2004	3.9 (23.4)	30.0	12.8 (76.6)	33.3	16.7
2005	4.8 (21.8)	23.1	17.2 (78.2)	34.4	22.0
2006	6.1 (20.7)	27.1	23.4 (79.3)	36.0	29.5
2007	8.2 (20.9)	34.4	31.1 (79.1)	32.9	39.3
2008	11.6 (22.3)	41.5	40.4 (77.7)	29.9	52.0
2009	12.5 (21)	7.76	47.0 (79)	16.3	59.5

Source: Nasscom

Wealth Creation by Information Technology Industry: Table 4 shows that information technology has created wealth more than Rs.90,000crore by the year 2002. This sector is also attracting large foreign direct investment. In the same year, 800 million USD of foreign investment has been attracted by this sector. A large number of factors have facilitated the fastest growth and development of information technology industry in India is abundant human capital, relatively low cost of technical labour, contribution of IITs and other leading engineering colleges in India, creation of global household brands, special attention to technology based industries and R&D by government, foreign investment in information technology industry, mathematical and logic expertise, entrepreneurial culture, the legal system in India is relatively simple and clear procedure, reverse brain drain, reasonable technical innovations, strong tertiary education, government support and policies, the quality inherent in the Indian information



technology and business process industry is excellent. various quality control and process management tools are used to improve the quality and to establish credibility, and familiarity with English language (India has the second largest pool of English speaking scientific professionals in the world. it is second only to the USA) (www.nasscom.org).

Years	Wealth Creation by IT Industry	Percentage Growth
1996	35.2	-
1997	41.2	17.0
1998	128.5	211.9
1999	545.4	324.4
2000	346.2	-36.52
2001	866.3	150.2
2002	910.7	5.1

Source: www.nasscom.org.

Growth of Information Technology Software and Services Exports: India has exported its information technology services to more than hundred countries around the world, but there is a heavy reliance on the USA market, which accounts for 62 percent of the total software exports. The leading software-exporting firms include the companies like Tata Consultancy Services, Infosys and Wipro etc. Table 5 shows that the exports of information technology software and services have increased from USD 3.4 billion in 1999-00 to USD 5.3 billion in 2000-01. Further these exports have increased to USD 17.7 billion in 2004-05 and USD 31.4 billion in 2006-07. The estimated exports of information technology software and services are USD 40.3 billion in 2007-08. The yearly growth rate of these exports have slightly declined during 2001-02 and 2002-03 but from 2003-04 onwards, the growth rate of exports of information technology software and services have increased significantly. During 2007-08, the growth rate was 28.3 percent.

Table 5 - Growth of Information Technology Software and Services Exports

Years	IT Software & Services Exports	Percentage Growth
1999-00	3.4	-
2000-01	5.3	55.9
2001-02	6.2	16.9
2002-03	7.1	14.5
2003-04	9.2	29.6
2004-05	17.7	92.4
2005-06	23.6	33.3
2006-07	31.4	33.1
2007-08 (E)	40.3	28.3

Source: www.nasscom.org.

Composition of Information Technology Industry in India: Composition of total information technology industry mainly comprises of software, ITES-BPO and hardware segment. Total software and services segment includes IT services and products, ITES-BPO, engineering services, R&D and software products. This segment is growing faster than the hardware segment in India.

Contribution of Information Technology Industry in Employment: Apart from wealth creation and large export earnings, Indian information technology industry has also

provided large scale employment to educated and skilled work-force. This is the fastest growing sector which is providing large employment opportunities. The very success of information technology industry in India is infact due to the availability of highly skilled work-force.

To ensure availability of trained manpower, spread of IT education has been given the necessary impetus both at the government and private level. Significant is the opening of Indian Institutes of Information Technology (IIITs) on the lines of Indian Institutes of Technology (IITs). Besides these, various certification courses like the highly popular DOEACC courses have been started. The National Association of Software and Service Companies (NASSCOM) have played a key role in the universalization of IT in India.

Indian education system gives more emphasis on mathematical skills and proficiency in English language and this has created skilled work-force preferably suited to the information technology industry. Indian universities are pumping out 1, 20,000 engineering graduates in a year.

Table 6

Year/ Item	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
IT Services & Exports	0.17	0.21	0.30	0.39	0.51	0.69	0.86	0.92	0.99
BPO Exports	0.11	0.18	0.22	0.32	0.42	0.55	0.70	0.79	0.78
Domestic Market	0.25	0.29	0.32	0.35	0.38	0.38	0.45	0.50	0.52
Total Employment	0.52	0.67	0.83	1.06	1.29	1.62	2.01	2.21	2.29

Source: Nasscom

The total IT Software and Services employment was estimated as 2.20 million in the year 2008-09 and it was only 0.52 million in the year 2001-02. The direct employment contribution in the estimated employment is about to 8.0 million in 2008-09. This translates to the creation of about 10.20 million job opportunities attributed to the growth of the sector. Direct employment within the IT-BPO sector is expected to grow by 4% reaching almost 2.3 million, with over 90,000 jobs being added in FY2010.

12th Five Year Plan

Information Technology sector has been one of the key drivers for faster and inclusive growth in the Eleventh Five Year Plan. It has contributed immensely to the development of Indian economy. India has become a global power house in software and software services sector. Over the years various initiatives have been taken in the Information Technology sector to foster innovation, improve delivery of e-Services to citizens and bring about profound change in the way business is conducted and the way Government works. Information Technology has tremendous potential for the future of India. In view of the overall priorities of the Government in the 12th Five Year Plan a focused and coordinated push in the IT sector during 12th Plan period will help India achieve faster, sustainable and more inclusive growth. Accordingly the vision and mission for IT sector for the Twelfth Plan



will be on e-Development of India through a multi pronged strategy of e-Infrastructure creation to facilitate and fast track e-governance, promotion of Electronics hardware manufacturing & Information Technology – Information Technology Enabled Services (IT-ITeS) Industry, providing support for creation of Innovation Research & Development (R&D), building knowledge network and securing India's cyber space.

The global Information Technology sector has made a noteworthy progress in the last decade. It has transformed the world, enabling innovation and productivity increases, connecting people and communities, and improving standards of living and opportunities across the globe. While changing the way individuals live, interact, and work, IT has also proven to be a key precondition for enhanced competitiveness and economic and societal modernization, as well as an important instrument for bridging economic and social divides and reducing poverty.

Conclusion

The IT sector has brought about revolution in India particularly since 1990s. This is because it has reduced intermediation in business and society, provided solutions across sectors (be it agriculture sector or manufacturing sector), re-organized firm level behaviour, empowering individuals by providing them with more information and is increasingly becoming an important tool for national and rural development through E-governance, E-Banking and E-Commerce programmes. The export performance of India's software and service sector during the last decade has been unprecedented. As a result, the software and service sector accounts for over 20% of India's total exports and 2.6% of GDP. In addition, there has been a marked decline in the share of onsite services and today almost 60% of India's software and services export takes the form of off shore services. The undifferentiated and service nature of Indian software firms has meant that human capital has acquired an importance that was hitherto reserved for financial and physical capital in Indian industry. In an extremely competitive international market for software services, Indian firms have tried to emphasize the quality of procedures and human resource used by them to gain competitive advantage.

Information technology is rapidly changing economic and social activities. It provides opportunities and challenges for making progress with accelerated growth and poverty reduction in India. Indian IT industry is one of the key industries to contribute its significance in the growth variables of GDP of India, exports, revenue and employment. The emergence of Indian information technology sector has brought about sea changes in the Indian job market. The IT sector of India offers a host of opportunities of employment. With IT biggies like Infosys, Cognizant, Wipro, Tata Consultancy Services, Accenture and several other IT firms operating in some of the major Indian cities, there is no dearth of job opportunities for the Indian software professionals. The IT enabled sector of India absorbs a large number of

graduates from general stream in the BPO and KPO firms. All these have solved the unemployment problem of India to a great extent. The average purchasing power of the common people of India has improved substantially. The consumption spending has recorded an all-time high. The aggregate demand has increased as a result. All these have improved the gross production of goods and services in the Indian economy. So in conclusion it can be said that the growth of India's IT industry has been instrumental in facilitating the economic progress of India. To conclude, it can be said that India is now an integral part of the *Global Village*, thanks to the developments witnessed in Information Technology.

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