

CHAPTER 13

INFORMATION TECHNOLOGY

13.1 India as Knowledge Power : In less than two decades, advances in information technologies have revolutionized government, scientific, educational, and commercial infrastructures. Powerful personal computers, high-bandwidth and wireless networking technologies, and the widespread use of the Internet have transformed stand-alone systems and predominantly closed networks into a virtually seamless fabric of interconnectivity. During this period, Indian IT industry has also built up an enormous confidence for itself in the global markets. The IT and IT enabled services (ITeS) sector are giving India the image of a young and resilient global knowledge power. The IT-ITeS industry has four major sub-components: IT services, business process outsourcing (BPO), engineering services and research and development (R&D), and software products.

13.2 India is considered as a pioneer in software development and a favorite destination for IT-enabled services. The Indian IT-BPO sector including the domestic and exports segments continue to grow from strength to strength, witnessing high levels of activity both onshore as well as offshore. The companies continue to move up the value-chain to offer higher end research and analytics services to their clients. India's leadership position in the global IT and BPO industries are based primarily on the following advantages. India accounts for around 28 per cent of IT and BPO talent among 28 low-cost countries. It has a rapidly growing urban infrastructure fostering several IT centres in the country. Offshore service centres are spawning in the country due to operational excellence with low delivery cost, quality leadership and a conducive business environment. Favorable policy interventions, enabling infrastructure and augmenting a wide skill base from the government has further enhanced India's brand image.

13.3 However, there is a real need to measure the digital divide in the country, including the urban-rural and gender divides, and the use of community Internet access centers by low-income users.

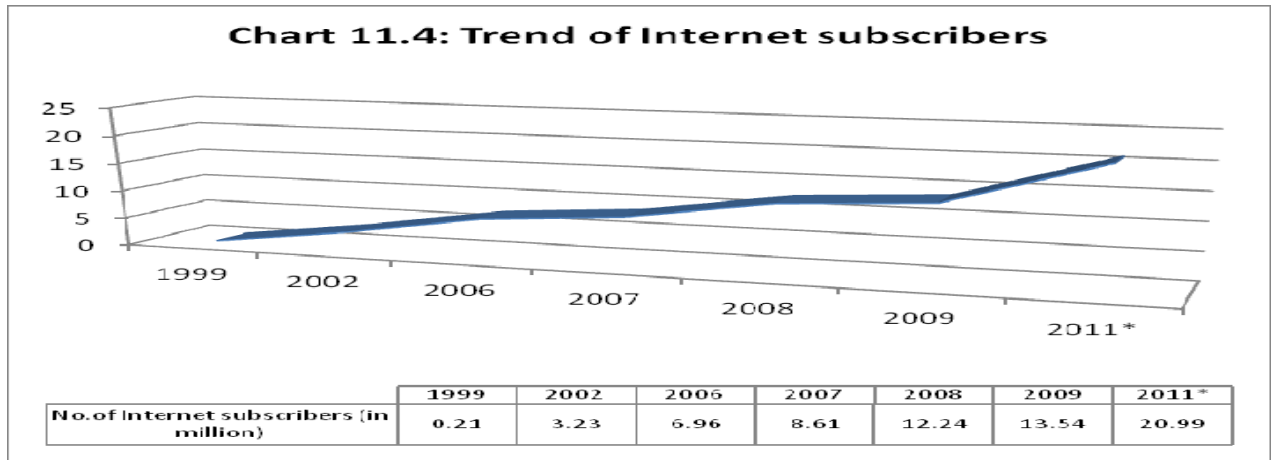
India's progress in ICT related indicators :

13.4 As per **Millennium Development Goals (MDGs), India Country Report 2011** three indicators related to ICT under Goal 8 (Develop a Global Partnership for Development), target 18 (In cooperation with the private sector, make available the benefits of new technologies, especially information and communication) are being monitored in case of India. They are as under :

Indicator No.	Indicator Description
47	Telephone lines and cellular subscribers per 100 population
48A	Internet subscribers per 100 population

Indicator: Internet subscribers per 100 population

13.5 Over a period of 12 years, internet subscriber base has increased from 0.21 million in 1999 to 20.99 million in 2011. The 20.99 million Internet subscribers at the end of Sep-2011 as compared to 19.67 million at the end of March-2011 registered a growth of 6.71% within a period of six months.



*As on 30th September 2011; for other years, the figures are as on 31st March.

Source: Telecom Regulatory Authority of India

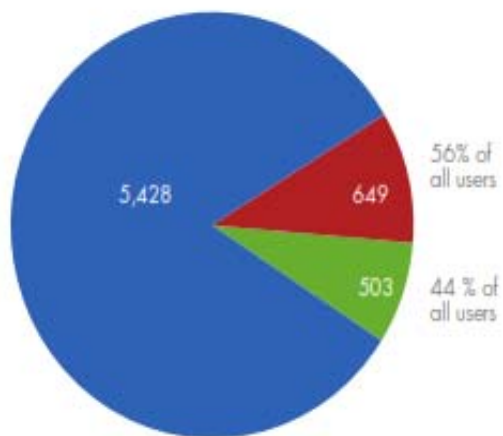
13.6 **Indicator: Personal computers per 100 population** : Use of Personal Computers has also increased from 5.4 million PCs in 2001 to 19.6 million in 2006. Sale of Personal Computers recorded a growth of 12% in 2010-11 touching 9.7 million. The Notebook sales were estimated to be 3.5 million in 2010-11 against 2.5 million in 2009-10, registering a growth of 40%. This shows that Notebooks have caught the fancy of the consumers. Desktop sales were estimated as 6.2 million in 2010-11 against 5.5 million in 2009-10 with a growth of 12.7%.

13.7 As per the **World Millennium Development Goals Report 2012**, the rapidly increasing number of internet users in developing countries has increased the overall share of developing countries to 63 % in 2011 vis a vis 44% in 2004.

Almost two thirds of Internet users worldwide are now in developing regions, although rate of use is lagging in Africa

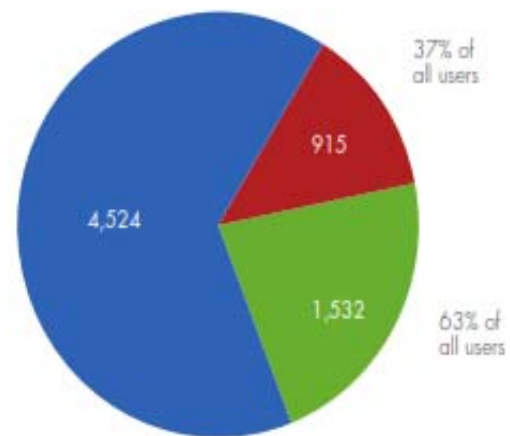
Number of Internet users, 2006

Total population: 6.6 billion



Number of Internet users, 2011*

Total population: 7 billion



■ Not using the Internet ■ Internet users in developed regions ■ Internet users in developing regions

* Data for 2011 are preliminary estimates.

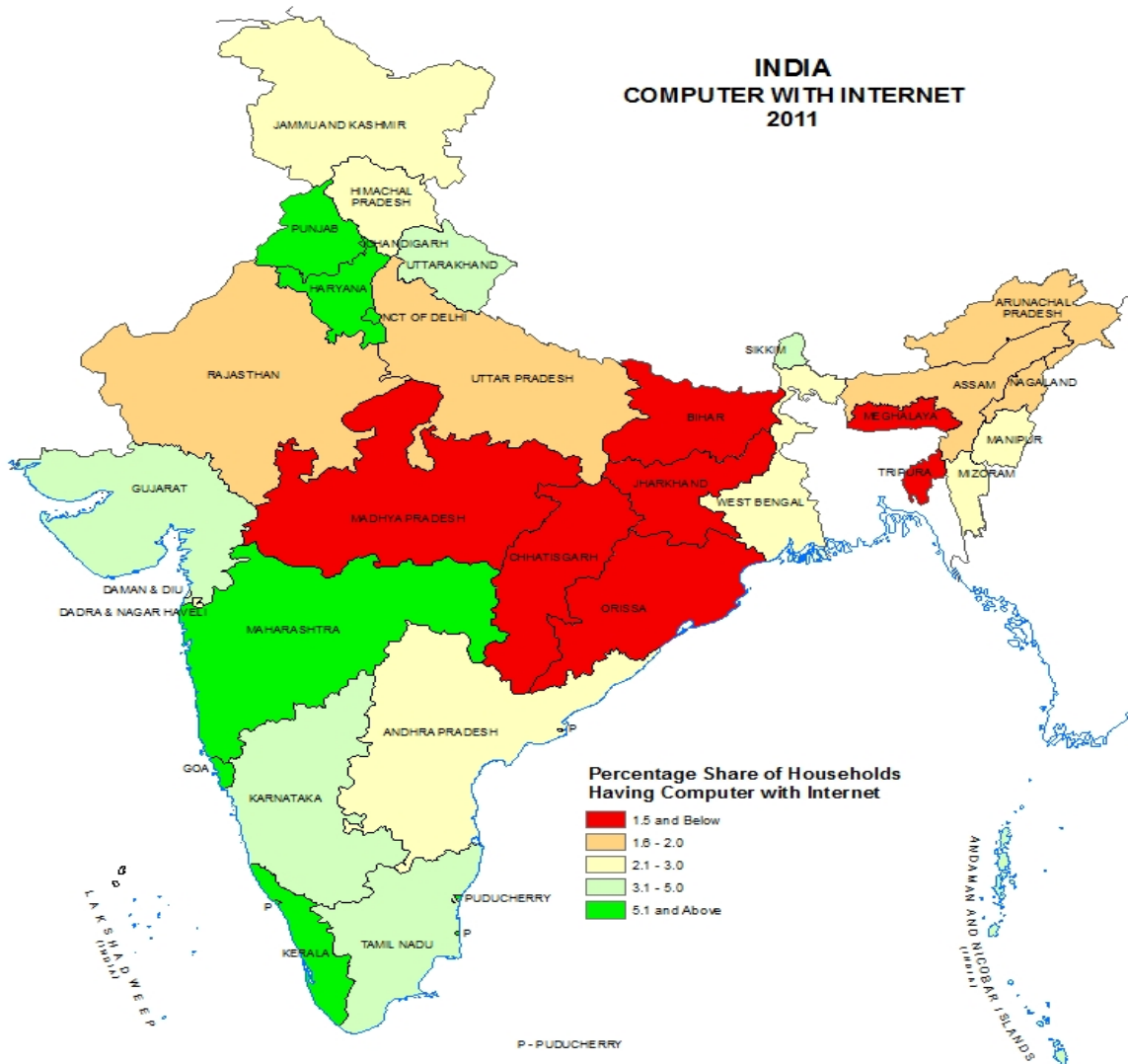
13.8 The penetration levels in the developing countries have also increased to 26% by end of 2011. The penetration level in India, as revealed by Census 2011, however, is lower.

13.9 As per **Census 2011**, about 20 per cent households, out of total of 246,692,667 households, in urban areas and 5 per cent households in rural areas had computers/laptops.

(Households in percent)

Assets	Total	Rural	Urban
Computer:	9.5	5.2	18.7
Computer/Laptop - With Internet	3.1	0.7	8.3
Computer/Laptop - Without Internet	6.4	4.5	10.4

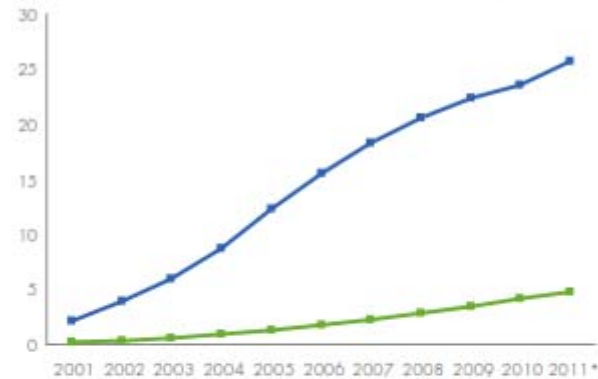
13.10 State wise distribution of the households having computers with internet facility, as per Census 2011, shows that Kerala, Maharashtra, Haryana & Punjab have highest penetration with more than 5 percent of households having the facility. On the other hand, amongst the major states, Madhya Pradesh, Chhatisgarh, Jharkhand, Odisha & Bihar have lowest penetration with less than 1.5 per cent of households having computers with internet facility.



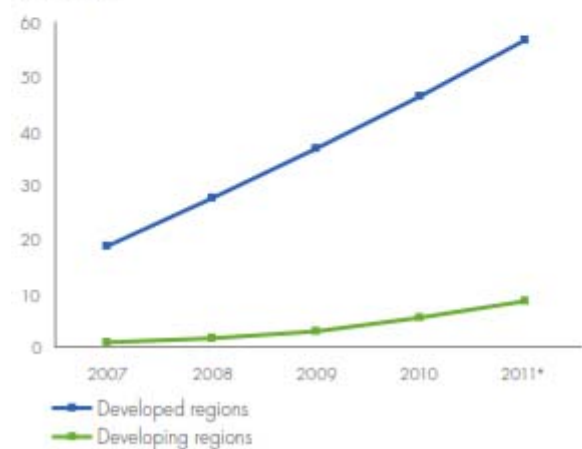
13.11 **Digital Divide** : Expansion in internet use and tele –connectivity depends on increase in PC penetration and wireless telephony, particularly in rural areas. The high rate of growth in the IT and Communication sector is still urban centric and highly skewed over States. The problems in the backward States continue to remain in the back- burner, while real benefit of connectivity is required the most in these areas. Similar digital divide is visible between developed & developing countries as well.

A global “digital divide” remains in terms of quantity and quality of broadband Internet access

Fixed broadband subscriptions per 100 population, 2001-2011*



Active mobile broadband subscriptions per 100 population, 2007-2011



* Data for 2011 are preliminary estimates.

As per World MDG Report 2012, in the developing regions, mobile broadband penetration stood at 8.5 per cent at the close of 2011, compared with 4.8 per cent fixed broadband penetration.

Mobile technology and services have helped to overcome major infrastructure barriers and brought more people online. But there is an important broadband divide, between regions and between developed and developing countries, in terms of capacity, quality and speed. While in developed economies an increasing number of fixed broadband subscriptions provide speeds of above 10 Mbit/s, many subscriptions in developing countries are slower than 2 Mbit/s. Slow delivery limits the type and quality of applications and services that can be accessed over the Internet.

Number of Broadband subscribers in India increased from 11.89 million at the end of March-2011 to 12.83 million at the end of Sep-2011, registering a half-yearly growth of 7.90% and Y-O-Y growth of 24.44%. Apart from this, 373.84 million wireless subscribers have subscribed to data services, as reported by the wireless service providers.

Production, Earnings & Exports - IT Sector :

13.12 As per the estimates of **NASSCOM**, India’s IT and BPO sector (excluding hardware) revenues were US\$ 87.6 billion in 2011-12, generating direct employment for nearly 2.8 million persons and indirect employment of around 8.9 million. As a proportion of national GDP, IT and ITeS sector revenues have grown from 1.2 per cent in 1997-8 to an estimated 7.5 per cent in 2011-12.

13.13 Software exports in 2011-12 are estimated at US\$69 billion compared to US\$59 billion in 2010-11. While exports continue to dominate the IT-ITeS industry and constitute about 78.4 per cent of total Industry revenue, the CAGR of the domestic sector has also been high at 12.8 per cent compared to the 14.2 per cent for exports during the Eleventh Five Year Plan period. The growth rate of the domestic Sector in

2010-11 was 20.6 per cent as compared to 18.8 per cent for the export sector; in 2011-12 it was 9.7 per cent for domestic sector and 16.4 per cent for export sector. In 2012-13, as per NASSCOM estimates, export revenues are expected to grow by 11-14 per cent and domestic revenues by 13-16 per cent. These estimates are a pointer to the possibilities of making further forays into the untapped domestic sector for IT and ITeS .

Year	Value (US\$ billion)					Growth rate (%) 2011-12	CAGR (%) 11th Five Year Plan
	2007-08	2008-09	2009-10	2010-11 (E)	2011-12 (P)		
Total IT BPO Services Revenue	52.1	59.9	64.0	76.3	87.6	14.8	13.9
Exports	40.4	47.1	49.7	59.0	68.7	16.4	14.2
Domestic	11.7	12.8	14.3	17.3	19.0	9.7	12.8

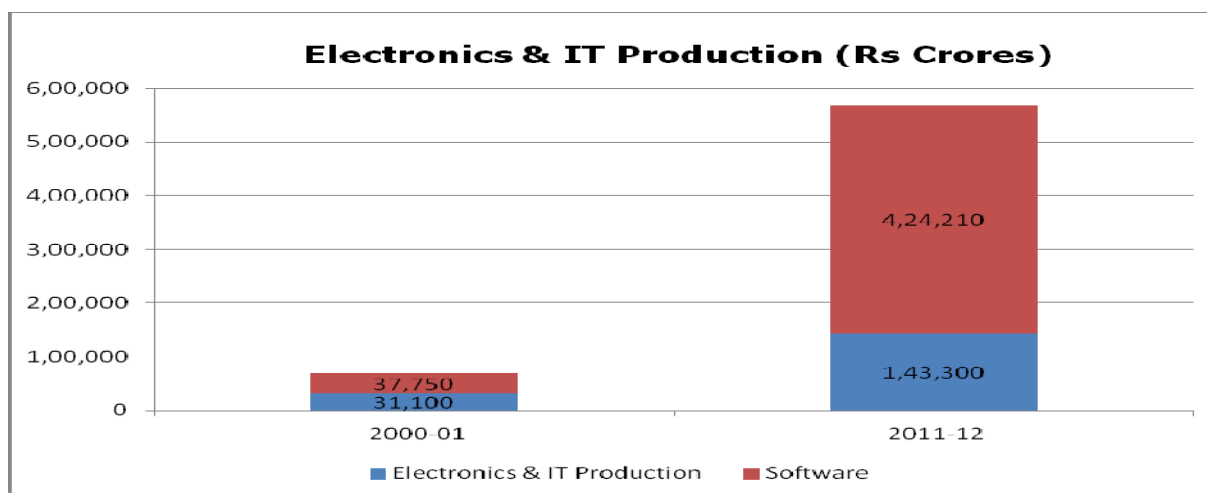
Source : NASSCOM.

Notes : P = Provisional; E = Estimated.

13.14 Consistent demand from the US, which increased its share in total exports of India's IT and ITeS services from 61.5 per cent to 62 per cent, characterized 2011-12. Emerging markets of Asia Pacific and the rest of the world also contributed to overall growth. While the industry's vertical market mix is well balanced across several mature and emerging sectors, there was broad-based demand not only across traditional segments such as banking, financial services, and insurance (BFSI), but also new emerging verticals of retail, health care, media, and utilities. Sub-sector-wise in 2011-12, as per the provisional estimates of NASSCOM, in the export sector, IT services were the major component with a 58 per cent share and CAGR of 15.7 per cent for the Eleventh Plan period; followed by BPO with a 23.1 per cent share and 12.5 per cent CAGR; and software products / engineering with a 18.9 per cent share and 11.8 per cent CAGR. Indian IT service offerings have evolved from application development and maintenance to emerge as full service players providing testing and infrastructure services, consulting, and system integration. The year also witnessed the next phase of BPO-sector evolution, characterized by greater breadth and depth of services, process re-engineering across the value chain, increased delivery of analytics and knowledge based services through platforms, strong domestic market focus, and Small and Medium-sized Business (SMB) centric delivery models. In the engineering design and products development segments, there was increasing use of electronics, adoption of fuel efficiency norms, convergence of local markets, and use of localized products. Increasing confidence between customers and service providers successfully executing a variety of activities across low-medium-high complexity projects has led to increasingly larger sizes of projects being sourced from India. In the domestic sector, the major component is IT services with 64.2 per cent share, followed by software products/engineering with 19.6 per cent share and BPO with 16.2 per cent share. The CAGRs of these sectors were 11.5 per cent, 13.6 per cent, and 18.1 per cent respectively. Strong economic growth, rapid advancement in technology infrastructure, increasingly competitive Indian organizations, enhanced focus by the government and emergence of business models that help provide IT to new customer segments are the key drivers for increased technology adoption in India. The IT and ITeS sector is also a generator of

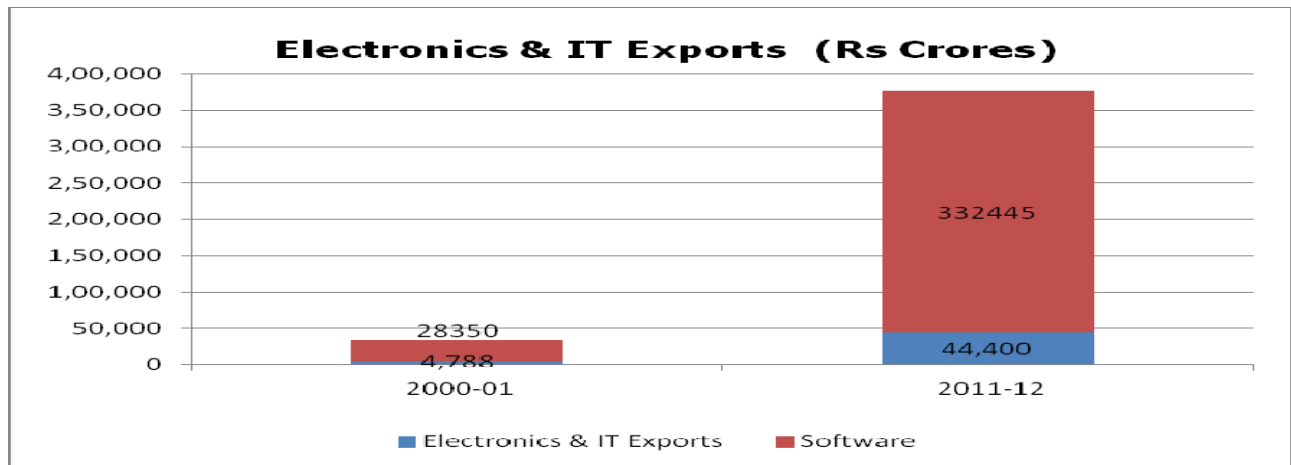
skilled employment with direct employment expected to reach 2.8 million in 201112 compared to 2.5 million in 2010-11.

13.15 As per **Annual Report 2011-12 of Department of Electronics & Information Technology** , Electronics & IT Production (consumer electronics, industrial & strategic electronics , electronics components , computer hardware, communication & broadcast equipments) recorded 361% increase in production since 2000-01 whereas software production (both for export & domestic use) an increase of 1024 per cent , taking the overall increase to about 724 per cent (Rs 68,850 to 5,67,510 Crores). The increase in production of Software for domestic use was about 876 % compared to 1073 per cent increase observed in case of software for export. During the period, the share of software for domestic consumption has declined (from 25 to 22 per cent) in the total software production because production of export related software has increased more rapidly.



Production in Rs Crores	2000-01	2011-12	Percent increase
Electronics & IT (Hardware)	31,100	143,300	361%
Software	37,750	424,210	1024%
Total	68,850	567,510	724%

13.16 Similarly, Exports of electronics & IT (hardware) recorded an increase 827 % (Rs 4788- 44400 Crores) during 2000-01 to 2011-12 whereas the growth in total export including software was more impressive at 1037 % (Rs 33,138- 3,76,845 Crores) because of much better performance in case of software export.



13.17 Challenges Faced by IT & ITeS Sector : Some of the challenges faced by the IT and ITeS sector include increasing competition from other countries with incentivized low costs, rising costs in India with wage-push inflation, increasing costs of relevant talent and skilled personnel, infrastructure constraints with over 90 per cent of total revenue generated from seven Tier-1 locations, risks like currency fluctuations and security, both physical and data related, and rising protectionist sentiments in key markets.

Government Initiatives:

National Knowledge Network

13.18 The National Knowledge Network is being implemented by Department of Information Technology to bring together all the stakeholders in Science, Technology, Higher Education, Research & Development and Governance. The application areas envisaged under the National Knowledge Network cover Agriculture, Education, Health, e-governance, Grid Computing (High Performance Computing). The output of the National Knowledge Network project will be a high capacity countrywide Infrastructure at education & research Institute level, to support education and research applications, and other application as envisaged by these institutions which require very high bandwidth. A high speed data communication network would be established, which would interconnect Institutions of higher learning.

Capacity Building Scheme

13.19 Government of India has approved the National e-Governance Plan (NeGP) in pursuance of its policy of introducing e-Governance on a massive scale. The NeGP vision is 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 to realize the basic needs of the common man". Capacity Building Scheme for an outlay of Rs 313 Crores for all the States/UTs for taking National e-Governance Plan (NeGP) forward across the country has been approved by the Cabinet Committee on Economic Affairs (CCEA) on 10th January 2008. The scheme is mainly for providing technical & professional support to State level policy & decision-making bodies and to develop specialized skills for e-governance.

State Wide Area Network (SWAN)

13.20 Wide Area Network is an advanced telecommunication infrastructure, which is used now-a-days extensively, for exchange of data and other types of information between two or more locations, separated by significant geographical distances. The medium of connectivity can be copper, optical fibre cable or wireless, as may be found feasible. Such wide area networks, in a way, create a highway for electronic transfer of information in the form of voice, video and data. Department of IT in Government of India is implementing an approved Scheme known as State Wide Area Network (SWAN) Scheme, envisaged to create such a connectivity in each State / UT, to bring speed, efficiency, reliability and accountability in overall system of Government-to-Government (G2G) functioning. When fully implemented, SWAN would work as a converged backbone network for voice, video and data communications across States / UTs. SWAN is designed to cater to the governance information and communication requirements of all the State / UT Departments. When fully implemented, SWANs across the country are expected to cover at least 50000 departmental offices through 1 million (10 lacs) route kilometres of communication links. Implementation of the SWAN Scheme is in full swing in 33 States/ UTs.

IT for Masses

13.21 "IT for Masses" is a Plan Scheme of Department of Information Technology (DIT). It was introduced in the Tenth Five Year Plan and continuing in the Eleventh Five Year Plan with the objective to provide financial assistance to various project proposals from States/UT's and Autonomous Societies for implementing ICT projects for development of Gender, SC & ST. The ultimate goal of "IT For Masses" scheme has been "Inclusive Growth" and this can only be achieved through skill development, capacity building exercises, creating IT Infrastructure for empowering Women and SC/ST communities

13.22 The **Draft National Policy on Information Technology 2011** seeks to bring ICT within the reach of the whole of India while at the same time harnessing the immense human resource potential in the country to enable it to emerge as the global

hub and destination for IT-ITeS Services by 2020. The NeGP comprises mission mode projects (MMPs) and core e-infrastructure. Significant progress has been made in laying down core e-infrastructure and in most of the MMPs. More than 97,000 common service centres (CSCs) have been established across the country as web enabled service access points for making public services available to citizens on anytime, anywhere basis. Initiatives under the NeGP also include online services related to income tax, Ministry of Corporate Affairs (MCA) 21, passports, and central excise. The government has also initiated new e-Governance projects for education, health, public distribution system and postal services. This will ensure the common man access to quality education, cost efficient and quality health care and postal services at affordable costs. The number of public services available to citizens in electronic mode will be expanded through the Electronic delivery of Services (EDS) Bill, approved by the union cabinet on 20th December 2011. In order to leverage the rapid growth in penetration of mobile technology and connectivity and also to ensure accessibility to all services to the common man, public services under all eGovernance projects will be delivered through mobile devices like mobile phones and Aakash tablets. Further, basic banking services, i.e. cash withdrawal, cash deposit, balance inquiry, and transfer of money from one account to another, will be extended to every panchayat through the CSCs and money transfer facility to every village by December 2013, leveraging ICT and mobile technology. This will help make financial inclusion a reality with the help of IT.

13.23 **Sources of information for IT Sector :** Certain data, in particular, data on the telecommunication sector, the IT industry and business process outsourcing (BPO) and data on the information society at large, are produced on a regular basis. A significant amount of data exists on the IT service industry, collected by **National Association of Software and Services Companies (NASSCOM)**, reflecting their members' data. In India, the indicators related to workforce, value added, imports & exports respectively are not strictly measured as per the International Standard Industrial Classification (ISIC). However, the information related to workforce & exports for this sector is maintained in National Association of Software and Services Companies (NASSCOM) for the IT-BPO sector. Similarly, data on IT manufacturing is captured by another private body, the Communication and Manufacturing Association of India (CMAI).

- NASSCOM is a premier trade body as well as the Chamber of Commerce of IT-BPO sector in India. It is a not-for-profit organization and has emerged as an authentic voice of this industry in India. It publishes an annual edition of its strategic review to disseminate the latest status of the industry based on the survey of large companies of this sector.
- The data related to production, exports and imports of this sector is also maintained by the **Ministry of Communication and Technology**.
- **Telecom Regulatory Authority of India (TRAI)** maintains information on teledensity , number of internet subscribers etc.

- **National Sample Survey Office (NSSO)** of the Ministry of Statistics and Programme Implementation, which conducts multi-subject integrated sample surveys all over the country, will conduct survey on the basis of a 10 year time frame on the number of household using computers (HH5). NSSO has been conducting , **Annual Survey of Industries (ASI)**, regularly whereby information related to the use of ICT is also collected.
- Recently Govt. of India, **Ministry of Statistics and Programme Implementation (MOSPI)** has signed an MOU to participate in the project on “**Statistical Compilation of IT Sector and Policy Analysis**” undertaken by Orbicom, the network of UNESCO Chairs in Communication. In this project an attempt has been made to compile data on the contribution of IT sector to the Gross Domestic Product (GDP) and employment to the Indian economy following internationally accepted and harmonized definitions and concepts emerging from the OECD and United Nations. The value added has been compiled from the existing data holdings of the MOSPI.
- **Office of Registrar General of India**, MHA also collects some information on availability of computers/laptops with/without internet connection, telephone connection etc. as a part of household amenities in households all over India during its **decennial Census** exercise.

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