

Information Technology in India: The Shift in Paradigm

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India is now known globally for its new mantra- Information Technology; which has its roots in the 'strategic infection' started by the success of India's export led software industry. Just a few years ago, a small group of initiators 'within' the government and entrepreneurs 'outside', visioned the opportunities and started branching from export of software to 'IT Enabled Services'. The government responded to this move by being a silent spectator, rather than imposing rules and controls. But within two years of this great initiative, even *the government has come up with full support to change the environment for Information Technology (IT)*. While the initial phase of IT in India witnessed a very small segment of public representatives in the government and entrepreneurs managing the micro environment to get more and more Information Technology related business to India, *the government will now enable a paradigm shift to "Hub to Globally Competitive value services" as against talent provider (Long Term National IT Policy), thus working as a catalyst to change the macro environment* to suit this opportunity. This has transformed Information Technology Business in India from a small sector to a large and growing industry. This change in status is leading to a major shift in paradigm:

from

1. IT as a sector
2. Providing satisfactory services to existing increase in demand
3. Government controlling infrastructure and technology
4. IT for specialists
5. Fulfilling external demand

to

- IT as an Industry
- Adding value to sustain the growth
- Government facilitating infrastructure and technology
- IT for masses
- Creating internal demand

I. Information Technology 'Industry'

Till a few years ago, Information technology did not have an industry status and was being dealt with the same rules as those applicable to conventional manufacturing

industry. But today, this industry is being provided the required support as a non conventional service industry.

With the objective to help India emerge as an Information technology super power, a task force on IT was set up in May 1998. This task force submitted 3 reports:

- Information Technology Action Plan I (Software)
- Information Technology Action Plan II (Hardware)
- Information Technology Action Plan III(Long Term National IT Policy)

These reports are forming a solid base for the present policy development to build India's infotech industry and proliferate use of IT in the country. The industry and government are now working together to form suitable strategies to not only capture this market but also add value to it.

II. Value Addition

The information technology policies being drawn by the Indian government are based on the ongoing recommendations of the National Association of Software and Service Companies (NASSCOM), the business strategist for Infotech for the government of India. This association is leading to policies that focus on the interdependence of business opportunities and social environment. The main focus in India is

- Adding value to Information technology as an industry
- taking IT to masses

Government of India as well as many state governments have started providing a special thrust towards I.T. Enabled Services. Central Government through department of Telecommunication has formed a 'Telecom Group on IT Enabled Services' to promote these services. The IT Enabled services have also been recognised as a key opportunity area for India. This has also urged industry and government to work together in order to form suitable strategies to capture this market. Govt of India has moved rather proactively on this front and some encouraging developments can be seen.

- A strong thrust is being provided to facilitate supportive infrastructure for proliferation of IT enabled services through out the country, especially in "non software" cities. 'Hi Tech Habitats' in rural hinterland adjacent to suitable cities are being promoted. While the location for five such habitats has been decided, the plan is to set up 50 such habitats by empowering the state governments to autonomously nucleate them within a technologically progressive and administratively liberal set of guidelines which will be prepared by the special Group on Hi Tech habitats to be set up by the taskforce. An important amendment in the tax laws has been made that is of high benefit to companies providing some of the IT enabled services.(www.teleworkingindia.com/Senario.htm)

- Dept of Revenue, Ministry of Finance has issued a notification whereby units engaged in call center services will now be allowed to import capital equipment without import duty and/or additional duty. Accordingly, units under STP/ EHTP scheme can undertake development of software, data entry and conversion, data processing, data analysis and control, data management as well as call center services for exports out of India
- In an effort to offer entire gamut of services and solutions to companies wanting to set up call centres in India, Netscape Communications and Electronic Research and Development Center of India (a scientific society under ministry of Information technology) have entered into an alliance to set up an internet based Application Service Provider (ASP) service, a customer relationship management competence center and a voice and web based call center facility (Financial Express, New Delhi 25/8/2000)

For IT services to be developed and sustained, it is necessary that the infotech infrastructure is established and made available to the working level staff. Following the proposal of IT Ministry, the government is considering to make literacy in Information Technology compulsory for recruitments by 2002. The proposal also envisages that all IT enabled services be made web centric so that they are accessible to public through the internet. (Business Standard New Delhi 25/8/2000)

To further make the administrative environment IT saavy, a 'Center for e governance' now offers services such as technical consultation, proof of concept and thematic presentations, besides creating awareness amongst decision makers at the central and state level and helping them in defining and implementing process and policy changes

Call Center Operations in India:

The GoI has recently released first set of terms and conditions for call center operators in India. The new policy initiatives are broad based and are aimed at liberalising call center operations in India. The salient features of the announcement made through a press note issued by the Department of Telecommunications are:

- Call Centers are being permitted on non exclusive basis against the requests received from IT service providers. these call centers can be international or domestic call centers.
- However, no interconnectivity of the international and domestic call centers is permitted. But interconnection of two domestic call centers of the same company is permissible, subject to prior written approval from DoT.
- International call centers will be permitted on IPLCs (International Public Leased Circuit) only and will cater to calls from foreign end PSTN (Public Switched

Telephone Network). however, no PSTN connectivity will be permitted at Indian end. On Indian end, even linking to any private or public network is not permitted for the IPLC, even if it is of the same organisation

- The domestic call center can have PSTN connectivity at one end or both ends or at the multipoints in a more complex configuration, with only incoming and with outgoing disabled at all places wherever PSTN termination is provided.

No other interconnectivity, except permitted as above, with any public or private network, shall be permitted to the call center set up.

With an objective to catalyse shaping the future of Indian trade and commerce, a newly formed electronic commerce network will establish itself as an interface between members and the govt and other regulatory authorities and represent the country's e-commerce interest internationally. This network will interact with overseas associations and bodies to import new technologies and ideas and will be engaged in analysing the resources available and required in the future to meet set targets.

Steps are now being taken to expand on the existing competitive advantages. Some of the concrete measures included in the long term National IT Policy are:

- With India having the largest pool of English speaking IT manpower in the world, the GoI will now encourage furtherance of this strategic advantage for increasing software export. Special incentives will also be given for increasing the language advantage in exports by promoting sections of IT manpower to cultivate other languages like European languages, Russian, Japanese and Chinese. For internal spread of IT culture, the knowledge and experience gained in language computerisation will be adequately extended to all the Indian languages by the year 2003.
- Migration of mathematical talents into mathematically oriented software development, through adequate number of scholarships as well as promotional retraining programmes, is also being encouraged now. This is important in view of the fact that one of the factors attributed to the software success of India is the mathematical and logic expertise in the background of more than 2000 years of mathematical culture.
- To create confidence among the recipient organisations in the developed countries for Indian software export, the existing copyright law, which is one of the toughest in the world, will be implemented in practice by suitably enforcing the existing laws. (IT Action Plan Part III)

III. Facilitating Infrastructure and Technology

With a resolution to make India a global IT super power, many revisions and additions have been made to the existing policy and procedures. One of the objectives for this revision is to, "Accelerate the drive for setting up a world class Info Infrastructure

with an extensive spread of Fibre Optic Networks, Satcom Networks and Wireless Networks for seamlessly interconnecting the Local Informatics Infrastructure (LII), National Informatics Infrastructure (NII), and the Global Informatics Infrastructure (GII) to ensure a fast nationwide onset of the INTERNET, EXTRANETs and INTRANETs." (IT Action Plan Part I)

Bandwidth requirements

The National Bandwidth Advisory Committee in India believes that supply must precede the demand for bandwidth in the country if the bandwidth issue has to be tackled. The government plans to offer bandwidth on demand as soon as it gets clearances from various departments. Videsh Sanchar Nigam Limited (VSNL) would be doubling its internet band width from 325Mb to 780Mb by the end of this year.

Nasscom's project Operation Bandwidth has recommended setting up toll free numbers facility to connect the international telecommunication links to Public Switch Telecom Networks (PSTN) on either side to software export companies. It has also asked to allow interconnectivity between networks of different service providers.

Nasscom has suggested a drastic reduction in tariffs to encourage more value addition from India and has recommended steeper volume discounts so that the companies can take more bandwidth and provide better customer service. A survey done by the association pointed out that connecting international telecommunication links to PSTN would help India become a customer service hub in the future and attract various organisations to set up their customer service centers in India.

Operation Bandwidth has other recommendations to add value to ITES. Some of the most important ones include:

- Interconnectivity between networks of different service providers
- Drastic Reduction in tariffs to encourage more value addition.
- Steep volume discounts to help companies take more bandwidth and provide better customer service.
- This business alone was projected to bring in an additional \$ 30 billion in foreign exchange by 2008
- IT enabled services cos be permitted to directly negotiate capacity requirements with fibre optic companies
- Web based call centers

Legal framework for IT

India is also realising the need to redesign the laws of the industrial age to those of the information age. The government feels that some areas immediately demand e-support in law, such as internet pornography, safety of children, protection of privacy, taxation, jurisdiction regulation and competitiveness, IPR in cyberspace, universal access, internet education, consumer protection, internet gaming and effective censorship.

Further to make e things happen, a combination of government regulation, industry self regulation and consumer education is essential. For this it is essential that the National advisory committee works out

- (a) Industry code of practice
- (b) E-commerce code for personal information protection
- (c) Parents advisory group for protecting children interests

Government regulations such as electronic transaction acts involving digital signature, certification authorities, computer misuse acts and denial of service attacks acts. This follows an e-cooperation in ASEAN nations to work out a uniform e-laws within the region to transact the business within and outside the region. (Information Technology and Development I: Commercial and Industrial Dimensions; UN-ESCAP- Regional Roundtable on IT & Development., New Delhi, May 2000)

Human resources

According to the Ministry of Information Technology (MIT), there will be no shortfall of manpower supply till 2008. On the demand side, it has worked out a figure of 23.67 lakh in three categories - 2 lakh in software products, 5.77 lakh in IT services and 12.9 lakh in IT - enabled services and e- business.

India produces about 73,000 students every year in the field of information technology. The government is planning to double the intake of number of technology students in the next academic session in professional colleges. As part of the plan to boost technology graduates, it is focusing on about 60 to 70 institutions, including academic bodies and private companies offering education in information technology. (Observer of Business and Politics 08/09/2000)

Infrastructure and the states

Many state governments are also taking initiative in developing suitable fiscal incentives, infrastructure facilities, coupled with adequate pool of skilled manpower. The state of Andhra Pradesh was one of the first to announce a special policy for IT Enabled Services industries. The states of Karnataka, Tamil Nadu, Maharashtra, Himachal Pradesh, Delhi, Goa, Gujrat and Orrissa have also announced special and attractive

initiatives. Karnataka is developing 'Grameen Data Processing Centers' around the Silicon Valley of Bangalore in places such as Mysore. Some state governments are also developing strategies for wooing large companies to set up IT Enabled Services units in their states. Some other states like Rajasthan, Delhi, Himachal Pradesh and Uttar Pradesh are in the process of announcing special policies for IT enabled services.

The state of Maharashtra has also chalked out an ambitious IT infrastructure plan for setting up 15 information technology parks with built up area of 41.40 lakhs sq. ft. spread over 900 acres of land. The state's IT vision hinges on a five fold strategy of providing infrastructure connectivity, fiscal and non fiscal incentives, human resource development and institutional frame work, state industries and water. (Business Standard, Mumbai, 22/08/2000)

IV Information Technology for Masses

The Information Society Index, prepared by the World Times and the International Data Corporation, gives one way of measuring a country's preparedness, across four types of infrastructure.

- a) **Information:** Creating the capacity to send and receive information by telephone, television, radio and fax.
- b) **Computer:** Extending access to computers in schools, workplaces and homes, building networks and using software.
- c) **Internet:** Expanding the internet in schools, workplaces and homes and enabling electronic commerce.
- d) **Social:** Building people's capacity to use information through education, freedom of the press and civil liberty.

The Indian government's target of IT for all by 2008, set in its action plan is in accordance with this index. This target has to be achieved through acceleration of "the rate of PC/set-top-box penetration in country from the 1998 level of one per 500 to one per fifty people along with a universal access to internet/Extranets/intranets by the year 2008.....The existing over 600,000 public telephones/ public call offices(PCO's) will be transformed into public tele-info-centres offering a variety of multimedia information services . (Information Technology Action Plan Part I)

Like many other countries, the internet in India is presently used by limited segments of the population. Sixty eight cities and towns in India constitute 92% of the total internet users (NASSCOM survey). Over half (59.2%) use the internet as an info source, 11.3% as an educational tool and just under 8.2% for entertainment. India had a

subscriber base of one million on June 30th 2000, which is likely to grow 23 million by December 2003. This penetration rate will be realised with the implementation of government plans about improvements on bandwidth and penetration through PC's as well as cable TV.

With increased accessibility of internet through cable, more and more people (24% by March 2005) are likely to shift from dial up subscription to cable. This is likely to increase the bandwidth requirement for cable internet access to 8.4Gbps by March 2005.

One way of increasing internet penetration in multi lingual India is through the development of softwares in regional Indian languages. IT is not reaching many segments in India because of its base in English, while not more than 3 to 4% Indians can communicate in English. More emphasis is now being laid on developing regional language software and encouraging multilingual multifont sites like indialanguages.com and apnamail.com. The Andhra Pradesh IT policy has especially emphasised on the development of regional languages software, which is one of the main reasons for quick spread of IT amongst the masses in that region.

V Creating Internal Demand

Besides setting high targets for exports, the IT Action plan also focuses on creating policy ambience for expanding the domestic market for IT.

- Recognising info tech as a 'critical enabling tool for assimilating, processing and producting all other spheres of knowledge' the government plans to launch 'operation knowledge' to universalise computer literacy. **(IT Action Plan -Part I)**
- As mentioned earlier a proposal has also been put forward to make literacy in IT compulsory for recruitments by the year 2002. This will also become essential in view of the steps being taken by the Government of India and many states towards e governance. Government sites of some states have already started graduating from static to interactive ones.
- The newly set up Centre for e governance discussed earlier will also create demand for IT by encouraging it in governance.

Innovative governance already started when the ministry of IT put the entire draft of rules for enforcing the landmark information technology act on its website for citizen reaction. For any law the government usually prepared the all important rules behind closed doors and notified them without checking up with the public. For a change, the information technology ministry invited citizens' reactions to its set of rules at the ministry website.

VI Recommendations

Country	Workforce	Market Access	Local Market	Infra-structure	Cosmo-politan	Cost Base
New Zealand	2	2	-	2	3	2
Kuala Lumpur	1	2	-	2	2	2
Japan	1	2	1	3	1	3
Hong Kong	1	2	2	2	2	2
India	3	2	2	2*	3	1
UK	1	2	2	3	2	3

* Infrastructure is good only in certain cities

- 1 denotes low - 2 denotes average- 3 denotes high

Source: www.teleworkingindia.com/scenario

A comparison amongst some countries in Asia Pacific highlights the need for extra efforts that need to be done by India in two areas: Infrastructure and Cost base.

While a lot of steps have been taken towards a stronger infrastructure and reduced cost base, some focussed efforts need to be done in the following directions, as also suggested by Nasscom:

1. PSTN connectivity

There is a strong need to permit PSTN connectivity at the Indian end, to international call centres as well as for software companies in India (who provide software support from India). To promote teleworking, Government of India should allow Internet leased circuits to be connected to PSTN at the Indian end, so that teleworking in its true form can take place.

This is important not only for larger establishment of international call centres (a great source of export revenue and employment) but also to encourage software companies to enable their employees to work as teleworkers. Further there should be no distinction between domestic and international call centers as far as interconnectivity is concerned.

2. Income Tax Exemption

Currently, some of the IT Enabled Services units are able to claim tax exemption under Section 80 HHE of the Income Tax Act. However, the government needs to exempt all of the IT Enabled Services of Income Tax.

3. Global Parity in Telecom Infrastructure

There is an urgent need to provide reliable communications infrastructure in India at globally competitive rates. In this context, some of the immediate steps, which need to be undertaken is to provide excellent affordable and on-demand connectivity with 100% uptime and reliability.

4. Inter-connectivity of International Call Centers/IT Enabled Services

There is a strong need to permit inter-connectivity between call centers or other units of IT Enabled Services. The drivers include:

- Ramp up ability for Disaster Recovery
- Load Sharing between the Centers for optimum utilization of expensive resources (International Bandwidth).
- Interconnect two facilities through fibre optic cable: This helps companies to establish customer/expertise specific centers of excellence. They should be viewed as extensions of the first. International call center. DoT maintains that it is not permitted. The guidelines need to be reviewed in consultation with the industry.

5. Reduction in tariffs for International connectivity

There is a requirement of large bandwidth from India to its customers internationally . Also the tariffs of high speed datacommunication need to be reduced drastically to encourage more value addition from India. The volume discounts must be steeper as well so that companies can take more bandwidth and provide better customer service.

As compared to international standards, the bandwidth tariffs in India do not get discounted with increase in volume. The cost of a 64 Kbps link from US to UK is around \$ 2000 per month and the discounts are deep for higher speeds. The charge for a 64 Kbps link to India from US is around \$ 5000 per month. For 1 MB, the charge is \$ 30,000 per month.

6. Interconnectivity across multiple networks

All forms of content, be it voice, image or video, are getting converted to IP traffic and are sent over the same network. End user phones are becoming digital and one can use a PC or an IP-phone to talk to a remote person, he/she being on a regular phone, mobile phone, PC or IP-phone. As world class IT companies we are expected to leverage technology to provide ubiquitous access to our employees to corporate network as well as to customer networks. For example, an employee must be able to check e-mail using a remote PC, a regular phone or a PDA. This requires interconnectivity between all forms of networks.

In India, multiple service providers are emerging to provide connectivity solutions. Some of these vendors can provide connectivity solutions; some of them can provide these solutions faster; and some of them can service the requirements better. Sometimes, alternate service providers other than DoT are the only solutions available based on available capacity. Here also, interconnectivity between networks of different service providers must be allowed.

7. 7x24 support of DoT links

Indian IT companies operate beyond the normal 8-hour workday; sometimes, they operate round the clock. In IT Enabled Services, 7x24 support is a must. DoT is not totally equipped in all cities to provide 7x24 support needed to operate in the global markets. Also, most companies are dependent on DoT to provide the last mile of connectivity and the service becomes critical to the survival of the IT companies.

8. Reduce Delays in Provisioning of International Bandwidth

International bandwidth is the lifeline for the IT Enabled Services business. INTELSAT (the only carrier permitted) transponder capacity is constraining. This is severely restraining the industry from realizing the true potential of a huge international opportunity. It may be worthwhile to mention that ISPs have been already permitted to establish international gateways and use alternate satellites. It is suggested that the IT Enabled Services (at least call center) companies be permitted to establish their own international gateways and use alternate satellite networks.

9. Scarcity of International bandwidth on Fibre

Many processes of IT Enabled Services companies are dependent on high uptime of telecom links. Unfortunately, the options permitted are limited. It is therefore suggested that the IT Enabled Services companies be permitted to directly negotiate the capacity requirements with the international satellite companies.

10. Build Supply Base of best knowledge workers

Introduction of courses on IT Enabled Services (ITES) as a vocational course under various schemes of Government of India as well as Private Training Institutes. For different kind of ITES services, accent training, diction learning, high accuracy, CAD/CAM, animation are also some of the important skills required which require specialised training. Also, we need to have national standards for ITES training.

11. Grameen Data Processing Centres

Government needs to encourage setting up of Grameen Data Processing Centres. This would facilitate employment in smaller towns. The initial purpose of these centers would

be 'digitise' all the relevant and archival government data. Such data processing centers are more cost-effective in smaller towns. Moreover, the country has lots of educated young men and women in smaller towns.

12. Creating the Ideal regulatory environment

Modify labour laws to support the IT-enabled service industry. For example, some states need to amend laws to enable women to work on night shifts etc. Lay out Clear and transparent rules governing IT-enabled service industry, such as industry categorisation, so that ITES unit can be started in residential areas; no power cuts are accorded to the industry etc.

13. IT Policy to encourage women entrepreneurs and employment

India has a large number of educated but unemployed women. Teleworking or working from home would provide immense opportunity for women to work from their houses. Central and state governments need to announce special policies to encourage women to encourage entrepreneurship in the IT Enabled sector amongst the women. The incentives can be in the form of easy access to venture capital/bank loans, subsidised computer education, easy loans for procuring hardware/software etc.