

Managing Technology in a Knowledge world

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“People don't buy technology..... They buy what technology does for them”

“Globalisation is usually on scapegoat for economic distress that has much more to do with the introduction of new technology or repetition of old mistakes “

In Globalisation and opening of Indian Economy , the product and their life cycles are changing very fast . **Manufacturing processes** to be reengineering for adopting flexible processes and manufacturing cycle time shortened . The concept of “Virtual reality” Flexible manufacturing technology and logistic designs are fast catching on with Indian Industries .

The technology is changing how we learn , Although we learn in different ways , we are increasingly more impatient at learning , and we do not like to read a lot of words . We expect software's to be intuitive to learn and use, with visual feedback at every step so we know what the software is doing . User interface standards also help , since we can expect certain types of behavior based on using other software's.

Managing technology

In corporate world , technology perception for different tier people have different meaning hence when we talk of managing the technology in corporate setting we focus on following :

- 1, Defining the technology need
2. Planning for Technology Changes
3. Selecting the appropriate technology
4. Initial prototype trial of technology

5. Sustaining and merging the technology in the environment
6. Technology up gradation and adoption to be always open
7. Continuous training to staff for knowledge gain , technology adoption and work with open attitudes.

1. Defining the technology need

In the new IT and knowledge world how we perform a task whether it is in a manufacturing set up or in a trading organisation will drastically change viz.

Companies will also focus on making breakthrough in software and hardware scalability.

In the area of training and continuing education, software will also need to orient itself to the wireless medium, besides in the PC. specifically it will have to address speech and video-based or integrated services.

It will a 'digital way of life ' in the new world order. Videos, notes, contracts, meetings, handwriting and speech recognition will all happen in the digital medium, so that users of these technologies can access information anywhere

Corporate missions will also undergo a metamorphosis to empowering people through great software anywhere on any device'

A modern business addresses the needs of organisations, merchants and consumers to cut costs. It simultaneously improves the quality of goods and services, and increases the speed of service delivery and use of computer networks to search and retrieve information in support of decision-making. The science of computing and information systems has emerged as a major change in business and in society. There is a revolution taking place in electronic commerce. Global networking and other broadband technologies are being used as competitive weapons in today's business. Under pressure from technological change, competitive and decreasing prices of hardware, the world of network infrastructure began a speedy transformation to new technological advancement. Local area

networks, robust, protocols, routers and user friendly software found market place that motivated individual initiative to experiment with networking. Customers today expect far greater degree of change in products, brands and services offered contrary to what has been the case in the past.

All the above factors will define the new technology/ technology up gradation needs for the organisations.

2. Planning for Technology Changes

We live and work in a period of continuous business transformation through the application of technology and marketing challenges as fashion and product life cycles become shorter. Change has become the norm. The environment has seen profound changes as a result of factors such as changing customer attitudes, increasing competition, new technologies and information overload. We must take advantage of every opportunity to improve our knowledge and skills. Opportunities exist to use collective strength to get the best from challenging markets, to disseminate information on new development, and changing requirements on a global scale to enjoy success and prosperity in the year ahead.

For example in the future, a hardware company's growth may be measured in terms of the data units that its products and technologies can handle. EMC Corporation, which manufactures disk drives, measures its growth by the size of data that its drives can collect from ATMs, laptops, mobile phones, information kiosks, credit card authorisation systems and web pages. Excite, for example, has collected 100 terabytes of data in 20 months. Global Telecom has collected 120 terabytes of data in 3 months, and a company called Delta Ventures has accumulated 80 terabytes in 12 months.

3. Selecting the appropriate technology

The technology selection cannot merely happen. The mission has to be crafted and engineered, with goals, targets and initiatives clearly drawn out. Internal controls have to be implemented. The target for the benefits has to be in measurable terms say like to move on from

34 sets per day per employee to 44 sets per day per employee. Both technical and mental changes are to be made.

Companies in Taiwan are planning to produce higher capacity disk drives , spurring a technology transition from system-centric to PC-centric to network –centric to content – based storage. EMC is looking at making the shifts from 80 billion to 80 trillion bytes of data, including speech, video and vision based systems. They expect that the server market is expected to grow from U\$\$20 to U\$\$35 billion , and the disk storage capacity market is likely to grow from U\$\$44 to U\$\$78 billion..

New operations require that you not only know about operating systems, net working systems and graphics packages, but also know how to connect and implement it on the Internet. The basic infrastructure flowed top down from formal meetings and standards that purported to chart the future requirements. Commercialisation and privatisation of the Internet through commerce service provider has led to the development of electronic commerce.

The ability to do business over the Internet benefit the Internet community and fosters market efficiency by facilitating small vendors entry into markets by providing consumers with broader range of choices. The net is an interconnection of computer communication networks, spanning the entire global area, crossing all geographical boundaries and touching life styles and so on.

4. Initial prototype trial of technology

To integrate the selection of appropriate technology and results prototype trials are necessary . The **Virtual Manufacturing** is to provide Modeling and simulation environment so powerful that the fabrication / assembly of any product including the associated manufacturing processes can be simulated in the computer. The powerful capability would take into account all of the variables in the real production environment form shop floor processes to enterprise transactions .

CAD technologies have improved over the years and designers are able to do a lot of analysis before a prototype is manufactured, but at the same time they are able to optimize the design in terms of cost of manufacture. We therefore have concurrent design teams where members bring in expert multifunctional inputs. In production centered applications the intensity visual focus and globes that replicate touch help submerge user in deep in Virtual Manufacturing, a support software creates interaction and scenario through graphical interactive interface.

Software creates parts of assembly and assembly line workers participate in Virtual Assembly the same.

Participants even feel the weight of components as well as restraint when penetrating a solid object. Thus engineers and designers need no longer guess about assembly procedures.

5. Sustaining and merging the technology in the environment

Samsung is the first MNC consumer electronics major in India to produce one million CTVs. It's reflections of the continuous quality and productivity levels. The Korean head office even awarded the Indian company the 'Quadruple productivity Flag' for manufacturing 44 CTV sets per day per employee. It's a reflection of the continuous quality and productivity improvement that Samsung has been trying to achieve since it entered India.

Samsung's Noida factory took on its new challenge, 'F1321' in April 2000. 'F1' stood for factory innovation, '3' denoted the challenge 3000 production campaign, '2' for the 200 minutes MTBF (mean time between failures) in the Auto Insertion Machine and '1' stood for the Samsung India goal to be the number one subsidiary in terms of productivity and quality. Challenge 3000 Campaign, denoting the production of 3000 CTV sets on any given day, was initiated in the CTV factory in January this year.

The company focused on three key aspects to achieve the quadruple productivity levels and achieve the F1321 campaign-maintain

conveyor and set-up improvement, marshalling or logistics improvement, and auto insertion MTBF improvements.

First, both the hardware and software conveyor and setup were modified. The conveyor length was reduced by around 10 metres and the rocket design was changed in the ageing section to improve transfer rates. In addition, the soldering machine was fitted with a double solder bath against one earlier- which improved quality as well as speed- while 15 sub-assemblies were put on jig in the sub-assemblies area. Further, a zigzag buffer conveyor was added through fresh investments to keep the picture circuit boards on the line and avoid the manual fatigue it from the line.

The company also instituted the concept of self-marshalling. The entire layout was changed for efficient handling and a '2 Line' concept was instituted to run two models on a parallel basis . Samsung India has also bought new Radial, Axial and Eyelet machines bringing in additional investments.

The technical changes were the least of the tasks; the entire production team in Samsung had to be mentally charged to meet the challenge. And the charge came from within. For instance, it was not merely the production head who was concerned with delivering... every single worker in the factory had to set up a target, to be mutually met. " No nit-picking was done. And no blame was thrown at any doorstep. Every worker knew what was the need . if there was an error, steps were taken to rectify it,

Today, the production facility and the warehouses of Samsung are linked through SAP R/3. each branch sends its weekly sales rolling plan to the sales head office, which then forms the basis of production planning, material ordering and dispatch of finished goods to the branches. The sales plan generates the production plan, which is the basis of the material resources planning and results in purchase requirement and ordering pattern .

The purchase requirement, in turn, is communicated to the company's key vendors through an EDI system called Global Logistics Network system(GLONETS), which also links Samsung India's purchase department with Samsung headquarters and the

international procurement offices in Singapore and Korea. This has helped the company optimize its logistics processes (including just-in-time delivery), reduce inventory levels and improve its flexibility and ability to respond to production details immediately.

6. Technology upgradation and adoption to be always open

Manufacturing industries needs to becoming more competitive globally , through strong technology , technical manpower, and innovative research and development . The technology upgradation The Indian industry has now adopted more technological advance systems such as Flexible Manufacturing system , Flexible manufacturing cells , transfer lines and automated production lines. **CNC** (Computerised numerical Control) , **DNC** (Direct Numerical Control) FMS and robotics systems are now used in approx. 17% of large and medium Organisation

FMS is being used for metal cutting , assembly and inspection work . The number of machines in each FMS varies from 2-8 and part variety from 10-100 , Processing of parts is done in batches and aprox.1-10 batches are formed to process the entire variety of products .

The globalisation of the automotive industry is being undertaken by the large OEMs in parts by the commissioning of **Flexible Manufacturing Plant** near to their local assemblers . This is being achieved by duplicating whole factories in several parts of the world . In the U.K. Japanese assembler plants have been augmented by FMS being commissioned in the large automotive components companies .

In India the same pattern is now being observed . In the UK or USA the smaller automotive component companies are concentrating on FMC and more of this type of technology is beginning to be seen in India . In both countries the arrival of competitors from other parts of the world have made a steep change in technology necessary in order to stay viable . The effect is to improve the standard of living

and the industrial environment for those working in the industry . The number employed by these industries is however considerably reduced from those previously required to operate the conventional equipment that has now been superseded.

7. Continuous training to staff for knowledge gain , technology adoption and work with open attitudes.

The continuous training's can help plan for these changes by providing an assessment study of the current situation complete with specific recommendations and a follow up plan designed for the company.

Training doesn't end when the class is over. In fact, the critical period that determines how successfully technology is implemented is immediately following the training class. Users need to be able to use their new training effectively and efficiently in their own environment. When users productively use their training on the job, confidence and quality will improve.

The training should be in open environments and with transparent objectives of the company among the staff and workers , to simulate learning process in the trainee.

An open environment is good for consumers because it promotes the introduction of new services, its application and promotion at lower prices. An open environment is good for the industry because it promotes innovation and cost reduction, which in turn leads to competitiveness. Since the benefits of the new technology adoptions flows primarily to consumers.

**Facing Global Competitiveness and Managing Technology
through
Industry Institute interface**

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The New Communication and Information Technologies revolution now stresses the need for regular industry-institue interaction for susataianbility in technology innovatyions and knowledge mangement. (NCIT) can be broadly categorised into computer oriented information technology and telecommunication and mass media. Even though the early initiatives were made a decade ago, this sector was awarded low priority. Consequently, this industry witnessed a slow growth in India. Associated high costs, inadequate government support and the lack of brick and mortar infrastructure compounded the problems in this industry. The picture has changed favourably in the last five years.

The Internet has come of age in India and Indians have taken to it like fish to water. It is estimated that there are about 30 million Internet users in the country. Of course, the numbers are higher in the metros and other urban places than in the rural areas. However, recent reports indicate that the rate of penetration in case of the Internet exceeds that of any other medium. While the telephone and cable TV took over 20 years to reach a penetration level of 10 percent of the mass market, the Internet has managed to achieve this in a period of 2 years .

e-Commerce, a major component of the Internet, is going to drastically change the principles of business practice, making it totally consumer oriented. It has opened up a vast reservoir of information and knowledge, not to mention its enormous possibilities for education, development and better governance. The e-commerce business has passed the stage of irrational expectations and is undergoing the transition through a disillusionment phase.

The office or the work place, as we know it today, is all set to change into a place with no geographical boundaries. Networking will allow a quantum leap in the performance of today's workstations and personal computers, which as stand-alone machines already rival, and will soon surpass in power the super computers of previous generations

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2. Planning for Technology Changes
 1. Institutes and Research & Development centers to innovate technology
 2. Incubate and Innovate technology concepts at Institution levels with practical problem from the industry .
 3. Redefine Institutions as knowledge incubation centers Industry as knowledge implementation centers.
 6. Initial prototype trial of technology at Institutions
 7. Sustaining and merging the technology in the environment
 8. Technology upgradation and adoption to be always open
 9. Continuous training to staff for knowledge gain , technology adoption and work with open attitudes.

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In the area of training and continuing education, software will also need to orient itself to the wireless medium, besides in the PC. specifically it will have to address speech and video-based or integrated services.

It will a 'digital way of life ' in the new world order. Videos, notes, contracts, meetings, handwriting and speech recognition will all happen in the digital medium, so that users of these technologies can access information anywhere

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A modern business addresses the needs of organisations, merchants and consumers to cut costs. It simultaneously improves the quality of goods and services, and increases the speed of service delivery and use of computer networks to search and retrieve information in support of decision-making. The science of computing and information systems has emerged as a major change in business and in society. There is a revolution taking place in electronic commerce. Global networking and other broadband technologies are being used as competitive weapons in today's business. Under pressure from technological change, competitive and decreasing prices of hardware, the world of network infrastructure began a speedy transformation to new technological advancement. Local area networks, robust, protocols, routers and user friendly software found market place that motivated individual initiative to experiment with networking. Customers today expect far greater degree of change in products, brands and services offered contrary to what has been the case in the past.

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For example in the future, a hardware company's growth may be measured in terms of the data units that its products and technologies can handle.

3. Institutes and Research & Development centers to innovate technology

There's another side to this Internet revolution, the Internet companies themselves - the dot.coms. They are an inherently global lot and know no physical boundaries. Companies delivering high value to customer are given valuations accordingly.

The knowledge millenium industries will be born out from the Institutions and R & D Centers viz. knowledge based industries like biotechnology and design engineering services offer enough scope for creating intellectual assets, which in the long run would be more valuable than physical assets. It is now widely acknowledged that physical assets are less important than the knowledge assets .

4. Incubate and Innovate technology concepts at Institution levels with practical problem from the industry .

The technology selection for innovation / new incubation cannot merely happen. The mission has to be crafted and engineered, with

goals, targets and initiatives clearly drawn out. Internal controls have to be implemented. The Institutions / R & D centers have to define the target for the benefits in measurable terms say like to move on from 35 sets per day per employee to 50 sets per day per employee. The practical implementation aspect for the development Both technical and mental changes are to be made.

5. Redefine Institutions as knowledge incubation centers Industry as knowledge implementation centers.

Conventional wisdom has it that future business winners, in the main, will be those companies that have the foresight and technology to take the battle down to the individual customer level. Hence the in the knowledge world the institutions will have to redefine themselves as knowledge incubation centers where knowledge inflow , outflow and development takes place and practical implementation will be in the industries hence industries should be termed as knowledge implementation centers .

6. Initial prototype trial of technology

To integrate the selection of appropriate technology and results prototype trials are necessary . The **Virtual Manufacturing** is to provide Modeling and simulation environment so powerful that the fabrication / assembly of any product including the associated manufacturing processes can be simulated in the computer. The powerful capability would take into account all of the variables in the real production environment from shop floor processes to enterprise transactions with prototype trial at Institute levels .

CAD technologies have improved over the years and designers are able to do a lot of analysis before a prototype is manufactured , but at the same time they are able to optimize the design in terms of cost of manufacture. The institutes therefore can have concurrent design teams where members bring in expert multifunctional inputs . In production centered applications the intensity visual focus and globes that replicate touch help submerge user in deep in Virtual Manufacturing, a support software creates interaction and scenario through graphical interactive interface.

Software creates parts of assembly and assembly line workers participate in Virtual Assembly the same.

Participants even feel the weight of components as well as restraint when penetrating a solid object . Thus engineers and designers need no longer guess about assembly procedures .

7. Sustaining and merging the technology in the environment

The knowledge incubation center develops the various prototype of technology , new research , developments which has to be after the successful prototype trial , pass for practical implementation in knowledge implementation centers .

It should be reflection of the continuous quality and productivity improvement that the implementation centers (industries) should try to achieve.

Like
Factory innovation
productivity and quality improvements .
Customer relationship management

The technical changes should be of the least of the tasks;
Every worker should know what was the need . if there is an error, steps should be taken to rectify it during the implementation,

This should help the company optimize its logistics processes (including just-in-time delivery), reduce inventory levels and improve its flexibility and ability to respond to production details immediately, respond to customer and CRM centric approach .

CRM as a management approach that enables organizations to identify, attract and improve retention of profitable customers by managing relationships with them. Essentially, CRM puts into practice the notion that focusing on customers, rather than products, is the most valuable proposition.

The pay-off for these efforts is the potential benefits of CRM. These include: customer retention; the ability of the organization to determine what combinations of products and services work best for the most profitable customers; and the awareness of an organization of the kinds of customers it wants to attract and retain.

To get more value out of the high-value customers they first need to know who they are and then how to treat them differently

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FMC and more of this type of technology is beginning to be seen in India . In both countries the arrival of competitors from other parts of the world have made a steep change in technology necessary in order to stay viable . The effect is to improve the standard of living and the industrial environment for those working in the industry . The number employed by these industries is however considerably reduced from those previously required to operate the conventional equipment that has now been superseded.

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I.T. Enabled Services ; Enhancing competitiveness of industries in Globalisation era

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With the globe shrinking in size and the Internet penetrating into every other home and office, this venturesome statement assumes great significance. Business scenarios have changed phenomenally in this decade, where traditional business practices and procedures have been incredibly transformed by virtue of the invasion of electronic commerce.

The Internet is being applied very creatively for almost any type of business and comes with many an in-built service and thus enables your products and services to reach out to the remotest of places on account of sheer reach. But while the best amongst us are still growing and re-learning the fundamentals e-business still remains a quantum leap and seems only utopian till it really starts giving you those dividends that you had in mind when you embraced it.

Corporate, both Indian and international, have unleashed an imposing range of e-business products and services to the end user and which guarantee state-of-the-art technologies and solutions that would ultimately catapult business ideas to dizzy heights within an amazingly low turnaround time. And this is just the beginning.

Notwithstanding the 'initial thrust cost' to institutionalise an e-business, the long-term benefits which accrue to the business is recouped many times over. Only the most creative and ingenious of the lot will surge ahead in this era of electronic commerce. It is in this very context that soon, we should be witnessing a mixed blitzkrieg of threats and opportunities for corporate India.

The trillions of dollars of revenue estimates thrown up by business analysts may not be totally unfounded. Manufacturing sales, distribution, receivables, vendor management, purchase and every other aspect of the operating cycle is being taken care of electronically. Quantum achievements have been recorded by companies who do customer relationship management on the Net. All these and the rest are indicators in the direction that e-business is culturally and technologically transforming the present business.

Traditional ways of doing business may not however change dramatically in some cases as some edifices may show signs of resistance to change! India is a good reference in question. On a very candid note, Internet and e-business being at its nascent stage here would take time to register into our minds and should remain like a square peg in a round hole until the e-revolution sweeps the ground off our feet.

Shopping for technology was never so easy. Thanks to the dotcom revolution, the world's best technology is just a few clicks away for eager Indian industrialists.

What's more, there is a ready market waiting to be tapped by many Indian entrepreneurs .

I.T Industry in India

India has a new mantra - Information Technology (IT) - and almost everyone has started chanting it. This IT mantra has its roots in the "passionate and strategic infection" spread by the unrivalled success of India's export led software industry. This passionate infection has not only made the software sector as one of the high value-addition and net foreign exchange earning industry, but has created history of sorts on the Indian stock exchanges. The potential of its high capacity to generate wealth, foreign exchange and employment has already caught the imagination of India's businessmen, citizens, economists, bureaucracy and politicians, alike. Software driven IT industry is today at the top of India's national agenda as an instrument and a model, for the modernisation of India's economy.

In India, there has been a gradual shift towards usage of IT in government, public sector, private sector as well as public services and education. However, usage of computers is yet to reach many homes in the country. Undoubtedly, it was the computerisation of railway passenger reservation system in 1986- that brought computers closer to masses. And, in the last two years - it is the power of internet, E-Commerce as well as Government of India's thrust - which is bringing I.T. in daily life of a common person in India.

Pioneering work done by Indian software companies using the high speed datacom links brought in new paradigm of offshore software development. In fact, Indian software industry has been recognised as representing one of the most successful business model that can help to sustain high growth and competitiveness. Thus, with software as the driving engine, since early 90's, the Indian IT industry has been growing at a phenomenal growth rate. What's more, India's software industry is torch bearer for not only India's IT industry but even Indian economy's global ambitions. It is a way to build competitiveness in technology-driven service economy.

India has many advantages to become an important player in the global IT industry. By marshalling its vast human, industrial and technological resources, especially with expansion of its software sector – the engine of the IT Industry, India can raise productivity of domestic manufacturing and services. Obviously, this will lead to IT in governance, IT in industry and IT for every citizen of the country. There are even talks of infusing tangible productivity gains amongst various sectors and communities through use of IT. The domestic opportunity is evident.

I.T. Industry in India ; Some facts & figures

To gauge the dimensions of the IT industry in India, it would be pertinent to look at the achievements, indicators and growth prospects of the Indian I.T. Industry:

- In the year 1998-99, the Indian IT industry has been estimated to have earned revenues of Rs 24,781 crore or US \$ 6.1 billion, a growth of 32.79% over the revenue of Rs 18,662 crore in the year 1997-98. This high growth rate has been achieved inspite of otherwise slow growth in Indian economy, uncertain political situation and not so healthy GDP growth.
- In the last five years (1994-1999), the Indian IT Industry has recorded a C.A.G.R. (Compounded Annual Growth Rate) of more than 40.5% which is almost double the growth rate of the IT Industry in many of the developed countries.
- In India, IT Spending as a percentage to GDP is currently less than 1 percent. In USA, however, IT Spending as a percentage to GDP is more than 3.5 percent. However, with Government of India's resolve to increase I.T. spending - it is predicted that by 2003, India's I.T. spending could be 2.5% of its GDP.
- The IT manufacturing sector is growing at an average rate of 28-30% annually over the past decade. The industry has over 135 major hardware players supported by over 800 ancillary units and small time vendors engaged in subassemblies and equipment manufacturing.
- Software continues to contribute a major portion of Indian IT Industry's revenues. During the year 1998-99, the Indian software industry's revenues constituted almost 65% of Indian IT industry's revenues.
- Software industry in India grew by 59% in 1998-99 with revenues of Rs. 15,890 crore, over the revenues of Rs. 10,040 crore during 1997-98.
- More than 203 of Fortune 1000 companies out sourced their software requirements to Indian software houses.
- R&D spending by Indian software houses reached about 3.2% of total revenues in 1998-99. This signifies ploughing of increasing resources in creating IPR and developing practices and domain knowledge for moving up the value chain.
- Peripherals showed significant increase in volumes and major surge in revenues. The peripherals segment grew at more than 59% with revenues

of Rs. 1,433 crore during 1998-99. It was partly aided by buoyant sales in non impact printers.

- IT training segment grew at over 32.7% with revenues of Rs. 1,250 crore in 1998-99. The SOHO segment and high end certifications contributed a significant portion of total IT training industry's revenues.
- During 1998-99, more than 820,000 PCs were sold in India. This took the PC penetration in India to 3.2 PCs per 1000 people by the end of 1998-99 (31 March 1999).
- Government has conventionally been recognised a key driver of domestic IT demand in India and even around the world. For example, in USA, about 23% of total domestic IT spending is derived from government and public sector units. However, in the year 1998-99, in India, Government spending constituted more than 28% of total IT spending.
- The major sectors which are witnessing a special thrust on adoption of IT are Central / State Administrations, Insurance, Banks, Energy, Financial Institutions, Defence, Public Tax System, Ports, Customs, Telecom, Education and Small Office Home Office / Individuals.
- Southern and Western states such as Andhra Pradesh, Tamil Nadu, Maharashtra, Karnataka in their drive to emerge as coveted Silicon Valleys in India and recognised as one around the world, contributed a large portion to total domestic IT spending. However, at the same time, many other states of India also announced major computerisation drives. These states included Gujarat, Kerala, Orissa, Delhi, Goa, Himachal Pradesh, West Bengal, Uttar Pradesh, Madhya Pradesh, Rajasthan, amongst others. As an instance to underscore the endorsement and gravity that the IT has acquired in India, Government of Jammu & Kashmir has drawn up plans to promote IT in state by inviting companies to set up IT Enabled Services units in the state as well as encouraging extensive use of IT in the state administration as well as educational system. It also completes a missing link in the vision of making India a world class IT user.

India scores over other countries

A comparison amongst some countries in Asia Pacific based on these factors highlights the following : (ratings are on a scale of 1 to 3, with 1 being the lowest and 3 the highest)

Country	Workforce	Market Access	Local Market	Infrastructure	Cosmopolitan	Cost Base
New Zealand	2	2	-	2	3	2
Kuala Lumpur	1	2	-	2	2	2
Japan	2	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		

POTENTIAL FOR INDIA

As per a survey done by NASSCOM, IT Services can generate the following amount of revenue and employment for India in the next ten years.

IT Enabled Services	1998-99		2008 (Projections)	
	Employed	Rs. Crore	Can be Employed	Rs. Crore
Back Office Operations/Revenue Accounting/Data Entry/Data Conversion	9,700	420	2,60,000	19,000
Remote Maintenance and Support	1,600	65	1,80,000	13,500
Medical Transcription/Insurance Claims Processing	3,800	140	1,60,000	11,000
Call Centres	1,400	40	1,00,000	6,000
Database Services	1,000	45	1,00,000	6,500
Content Development	5,500	270	3,00,000	25,000
Total	23,000	980	11,00,000	81,000

PRIME INDUSTRY TARGETS

Undoubtedly, the IT Enabled Services is an essential infrastructure for most larger organisations. However, its very nature is particularly suited to service organisations which experience large turnover of data, have a frequent and extensive customer interface and in which, tolerance for mistake or customer dissatisfaction is low. In view of such an imperative, some of the industries that may be pursued are:

- Insurance
- Banking
- Financial Institutions
- Hospitality
- Large Hospitals
- Consortiums of Legal Firms
- Software / Hi-tech companies that have to provide 24-hour helplines
- Large manufacturing companies
- Airlines
- Utilities

The above are only indicative of potential industries that may be tapped.

GOVERNMENT CHIPS IN

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 I.T. Enabled Services' to promote I.T. Enabled Services.

National Taskforce on IT and Software Development recommends Hi-Tech Habitats: As part of the 108 recommendations made by National IT Taskforce, Government of India is providing strong thrust to facilitate supportive infrastructure for proliferation of IT Enabled Services throughout the country. In fact, stress is being laid on developing suitable infrastructure in 'non-software' cities. As per the recommendation, "Hi-tech industries flourish essentially in the rural hinterland adjacent to the cities with modern telecom and communication infrastructure and top class hi-tech educational/research institute. India will promote 'Hi-tech Habitats' in the rural hinterland adjacent to suitable cities. Initially, five such Hi-tech habitats shall be planned and implemented in the rural hinterland of the cities: Bangalore, Goa, Calcutta, Ahmedabad, Thiruvananthapuram, Chnadigarh, Chennai, Hyderabad, Delhi and Bhubneshwar.

It is estimated that progressively 50 such Hi-tech Habitats can be viably set up 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.

Spectrum of IT Enabled services

Three factors drive the growth of IT-enabled services

It has been seen that there are three factors which are driving the growth of I.T. Enabled Services; they are Outlocation, outsourcing, and the worldwide web.

Outlocation is the term used for obtaining services outside the national borders of a company. Outlocation helps companies to lower costs, take advantage of the global 24-hour clock, find the most optimum global talent, and achieve economies of scale by concentrating resources. A host of companies are now outlocating services.

Outsourcing is the term used for obtaining services from another organisation (or third party). Services currently outsourced include processing credit cards, claims, payrolls, etc.; providing information systems, such as data centres, networks, and help desks; and undertaking business processes, such as customer service, finance, logistics, and Human Resource. Outsourcing has become a large market; currently it amounts to over \$100 billion in value.

Finally, the **growth of the Web** is stimulating the growth of IT-enabled services by allowing companies to centralise services and/or operations at the globally most optimal location while providing access to customers anywhere in the world. Providing services through the Web is also significantly reducing transaction costs. To illustrate, an industrial company can reduce its transaction costs by 40% by providing customer services through the Internet rather than through call centres.

Amongst others, the spectrum of IT Enabled Services applications already evident in India include the following broad segments:

- A. Call Centres
- B. Medical Transcription

- C. Back Office Operations, Revenue Accounting, other ancillary operations
- D. Insurance Claims Processing
- E. Legal databases
- F. Content Development / Animation
- G. Payroll
- H. Logistics Management

Some of the above service areas are described as under.

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A typical call centre is a service centre which has adequate telecom facilities, trained consultants, access to wide databases, internet and other on-line information support infrastructure to provide information and support to a customer. It operates to provide round the clock and year round service. A typical call centre functions as follows:

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For example, in many countries, airlines have toll free numbers, where people can call 24 hours a day to make and change flight reservations, inquire about the status of bookings etc. What is required here is also a workforce of graduates who understand English. Since everybody is connected to the same central computing facilities, it does not matter where the person sits. Due to increased global connectivity, it does not matter if the call centre is located in the city of the caller or anywhere else in the world.

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Call centres are normally operated by large airlines, banks to provide services to the customers/callers, investment banks, mutual funds, telecom services, companies providing customised and high value services, IT products companies, amongst others. The primary determinant is, any industry that has

frequent interaction with a broad client base and intensive stakes in services being offered to the customer, where time and material value is of paramount importance. These services are very popular in countries such as USA, Europe, Japan and Australia. Some of the latest trends and value added services deployed as part of call centre design and operation are:

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Medical Transcription

In countries like the USA, doctors' time is at high premium. The current practice is for doctors to simply record their findings through a dictaphone or some such device. These sound tracks are then sent through datacom lines to overseas companies (where costs are much lower) that employ "medical transcriptionists" who hear these recordings, transcribe them into reports and send them back electronically through datacom lines. This has now become a specialised discipline with people needing adequate training. Information and communication technologies are used to send the voice recordings on satellite lines to far-off, low cost locations, where these recordings are transcribed into reports which are again sent back to the hospitals or clinics digitally through the same lines and printed as reports locally. Turnaround time is often as low as two hours and, therefore, is often better than what the hospital may have achieved if it had done all of it in-house.

Initially, it was only being contracted out to companies that were in close proximity to these hospitals. Increasingly, however, to take advantage of lower costs, this work is being sent abroad to Mexico, West Indies etc. Because of the availability of high speed satellite links, it is now entirely feasible to do this in India in technical terms. What is even more important is that the raw material in India is even more abundant in this field than in software, because all we need are graduates who have the ability to read and write English with reasonable comprehension abilities. Even better, such projects do not have to be set up only in the large cities, but can even go to the smaller cities in India. In the software field, it would take 5 - 7 years to create a company employing 1500 people, while in this area, this could be done just in 12 months. The social benefits are also much better, since the employment is not only for high price, high income level, but for the somewhat less economically privileged community. And of course, this is all export oriented and highly profitable.

Back Office Operations, Revenue Accounting, Other ancillary operations

Industries such as Banks, Airlines require large scale data entry and revenue accounting work to be done. For revenue accounting and other backoffice accounting operations, paper documents / raw data are sent to remote locations, which are used for data entry and necessary reconciliations. Using high speed datacom links for their back office and data processing operations, these banks, airlines and other organisations with extensive data turnover and customer interface, are able to save costs and valuable resources. The prime concern of these companies is 100% availability of data and uptime of facilities. This can be ensured through high speed datacom links from India to the parent country. In other words, such a centre could be realised simply as an offshore extension of existing information and backoffice operations promising constant availability.

Over the last few years, there has been a steadily growing trend to outsource these services to major IT service providers with contracts running into decades. The prime criteria for such projects is quality of organisational processes, availability of abundant manpower and ability to dedicate resources to clients' needs. India stands to gain from such a trend as Indian software industry has been able to make a mark and also has access to a huge pool of skilled as well as semiskilled professionals with relative cost advantage.

Insurance Claims Processing

Large insurance companies get myriads of claims. Since there are well laid down rules on how they are to be processed, such processing can be done anywhere, as long as there is availability of graduates who can read and write English in large numbers, a few doctors and a few accountants. As a result, to save costs, large insurance companies in the US are now outsourcing a lot of this work. This is another good opportunity area.

Legal databases

There is a constant need for lawyers who counsel cases to go through relevant laws, rulings and precedents in order to build up their case. This is usually done by very junior lawyers in legal firms. However, in the US and other developed countries, even junior lawyers' services are highly priced. One of the ways to get around this hurdle is to have a readily accessible source of well managed and intelligent information. One of the most promising and low cost way of having ready access to information is information technology. Therefore, many legal firms have started to outsource this work to organisations who have a large English speaking, lower priced workforce of trained lawyers. The job comprises of working closely with the firms to create a database of their existing records, index on the basis of various useful and common understood criterion, keeping track of new documents being created and incorporating them into database as per well established parameters. Lawyers can then simply use their computers to

draw up a history of like cases and draw a clear plan of action. Once again, the rules are clear and only average qualifications and ability are required.

Digital Content Development / Animation

New Media content development is emerging as one of the fastest growing service segment in the global IT services industry. It caters to needs of web site management, production of content for new media such as Compact Disk, Digital Versatile Disk and products of convergent technologies such as internet enabled TV. It offers a large emerging potential; as more and more offices, homes, institutions, students and professionals realise an ever growing need to have easy access to information that can also be suitably fused with other media.

It consists of compilation and development of digital content for intra-organisation dissemination, cross-institution usage, collaborative projects, public domain information, programs for public / specialised education, web content development and management, developing animated movies. It typically involves defining a set of rules and norms for collection of data; collating various unorganised sources of data; sorting; indexing and sifting; compilation; conversion into digital format and disseminating to various users. In other types of digital content development, there is usually a contract between content provider and developer to review project on an ongoing basis such as cartoon movies, etc. Opportunities also include acting as an offshore content developer for organisations such as internet media companies and advertising organisations where there is a constant need for content development. It would also ensure that operations are not erratic. Especially, web content development is becoming a multi-billion dollar segment.

There are several other such areas where the potential is high. The acceptability of outsourcing such work to distant countries and the recognition of the cost savings is rapidly growing.

India is emerging as an attractive outsourcing destination to companies around the world in the software sector. What India now needs to do, is to replicate its success in the software sector in the sector of IT Enabled Services.

INDIA offers many advantages

India offers many advantages to serving as an IT Enabled Services destination for major global companies These include:

- s. A virtual 12-hour time zone difference with USA and other major markets for IT Enabled Services
- t. A huge pool of English speaking and computer literate graduate manpower who can continue to cater to the growing demand for

- professionals for IT Enabled Services. These professionals are skilled as well as quality conscious.
- u. Cost of qualified personnel is amongst the lowest in the world
 - v. Stable legislative and economic framework
 - w. Support of Government of India for all IT led industries
 - x. Recently, Government of India announced a special policy for call centres in India.
 - y. Many State Governments in India offer special incentives and infrastructure for setting up I.T. Enabled Services
 - z. Thrust by Government of India to make India an IT-driven nation with a focus on services sector where potential for value addition and thus premium is higher.
 - aa. India enjoys very strong brand equity in major markets, thanks to its growing and globally competitive software industry

The proliferation of IT Enabled Services and its continuing demand-led growth may well emerge to be a strong opportunity for India, both in terms of generating employment and export.

As evident, IT Enabled Services is a major boon for India as it provides tremendous potential to provide employment opportunities and attract foreign investments. Amongst others, the benefits include:

- bb. Generation of new direct or indirect investment
- cc. Earning of Foreign Exchange leading to higher earnings of local staff
- dd. More revenues to telecom carriers
- ee. Introduction of new technology
- ff. Transfer of skills to India
- gg. Increase in competitiveness
- hh. Improved parity of income levels in and far flung areas such as North East or Jammu & Kashmir.

SUMMARY

Thus, the potential for India is very high in the sector of I.T. Enabled Services. The opportunities exist in either setting up of independent ITES units or franchise of International companies or their vocational and training company.

Thus it is evident that different models can be adopted. Companies in India can adopt some of the following models for marketing their services and to grow relationships with long standing customers. These models would typically span over following schemes:

- ii. **Multiple IT Enabled Services Training Institution:** Providing trained workforce for deployment in subsidiaries of foreign companies as well as Indian companies.

- jj. **Vertically Integrated training plus services company:** The company can have an internal well managed loop of inducting new workforce and training them for outside employment as well as internal absorption. This is considered an ideal architecture.

- kk. **Sell-out:** Companies can enter into a long term alliance with customers that can assure of sustainable and growing revenue streams. Companies can offer the model of setting up the facility, establishing processes for workforce and services delivery; and harvesting. Harvesting comprises of maturing upto high quality service levels, reaping profits for a mutually decided period of time and then selling out over pre-negotiated or a fresh negotiated terms. This is considered advantageous for both parties as it serves mutual interests.

It is evident that India is well positioned to take full advantage of this new revolution of I.T. Enabled Services and emerge as a Global Hub for these services.

Dr.Ranjit Singh is Director & Professor at Center for Management Sciences and Industrial Collaboration, Malviya Regional Engineering College , Jaipur & Mr. Ajay K. Gupta is Managing Director of leading IT and Industrial Consultancy Company Kamtech Associates Pvt Ltd., Jaipur

I.T. Enabled Services ; Enhancing competitiveness of industries in Globalisation era

Ajay Kumar Gupta

With the globe shrinking in size and the Internet penetrating into every other home and office, this venturesome statement assumes great significance. Business scenarios have changed phenomenally in this decade, where traditional business practices and procedures have been incredibly transformed by virtue of the invasion of electronic commerce.

The Internet is being applied very creatively for almost any type of business and comes with many an in-built service and thus enables your products and services to reach out to the remotest of places on account of sheer reach. But while the best amongst us are still growing and re-learning the fundamentals e-business still remains a quantum leap and seems only utopian till it really starts giving you those dividends that you had in mind when you embraced it.

Corporate, both Indian and international, have unleashed an imposing range of e-business products and services to the end user and which guarantee state-of-the-art technologies and solutions that would ultimately catapult business ideas to dizzy heights within an amazingly low turnaround time. And this is just the beginning.

Notwithstanding the 'initial thrust cost' to institutionalise an e-business, the long-term benefits which accrue to the business is recouped many times over. Only the most creative and ingenious of the lot will surge ahead in this era of electronic commerce. It is in this very context that soon, we should be witnessing a mixed blitzkrieg of threats and opportunities for corporate India.

The trillions of dollars of revenue estimates thrown up by business analysts may not be totally unfounded. Manufacturing sales, distribution, receivables, vendor management, purchase and every other aspect of the operating cycle is being taken care of electronically. Quantum achievements have been recorded by companies who do customer relationship management on the Net. All these and the rest are indicators in the direction that e-business is culturally and technologically transforming the present business.

Traditional ways of doing business may not however change dramatically in some cases as some edifices may show signs of resistance to change! India is a good reference in question. On a very candid note, Internet and e-business being at its nascent stage here would take time to register into our minds and should remain like a square peg in a round hole until the e-revolution sweeps the ground off our feet.

Shopping for technology was never so easy. Thanks to the dotcom revolution, the world's best technology is just a few clicks away for eager Indian industrialists.

What's more, there is a ready market waiting to be tapped by many Indian entrepreneurs .

I.T Industry in India

India has a new mantra - Information Technology (IT) - and almost everyone has started chanting it. This IT mantra has its roots in the "passionate and strategic infection" spread by the unrivalled success of India's export led software industry. This passionate infection has not only made the software sector as one of the high value-addition and net foreign exchange earning industry, but has created history of sorts on the Indian stock exchanges. The potential of its high capacity to generate wealth, foreign exchange and employment has already caught the imagination of India's businessmen, citizens, economists, bureaucracy and politicians, alike. Software driven IT industry is today at the top of India's national agenda as an instrument and a model, for the modernisation of India's economy.

In India, there has been a gradual shift towards usage of IT in government, public sector, private sector as well as public services and education. However, usage of computers is yet to reach many homes in the country. Undoubtedly, it was the computerisation of railway passenger reservation system in 1986- that brought computers closer to masses. And, in the last two years - it is the power of internet, E-Commerce as well as Government of India's thrust - which is bringing I.T. in daily life of a common person in India.

Pioneering work done by Indian software companies using the high speed datacom links brought in new paradigm of offshore software development. In fact, Indian software industry has been recognised as representing one of the most successful business model that can help to sustain high growth and competitiveness. Thus, with software as the driving engine, since early 90's, the Indian IT industry has been growing at a phenomenal growth rate. What's more, India's software industry is torch bearer for not only India's IT industry but even Indian economy's global ambitions. It is a way to build competitiveness in technology-driven service economy.

India has many advantages to become an important player in the global IT industry. By marshalling its vast human, industrial and technological resources, especially with expansion of its software sector – the engine of the IT Industry, India can raise productivity of domestic manufacturing and services. Obviously, this will lead to IT in governance, IT in industry and IT for every citizen of the country. There are even talks of infusing tangible productivity gains amongst various sectors and communities through use of IT. The domestic opportunity is evident.

I.T. Industry in India ; Some facts & figures

To gauge the dimensions of the IT industry in India, it would be pertinent to look at the achievements, indicators and growth prospects of the Indian I.T. Industry:

- In India, IT Spending as a percentage to GDP is currently less than 1 percent. In USA, however, IT Spending as a percentage to GDP is more than 3.5 percent. However, with Government of India's resolve to increase I.T. spending - it is predicted that by 2003, India's I.T. spending could be 2.5% of its GDP.
- The IT manufacturing sector is growing at an average rate of 28-30% annually over the past decade. The industry has over 135 major hardware players supported by over 800 ancillary units and small time vendors engaged in subassemblies and equipment manufacturing.
- Software continues to contribute a major portion of Indian IT Industry's revenues. During the year 1998-99, the Indian software industry's revenues constituted almost 65% of Indian IT industry's revenues.
- More than 203 of Fortune 1000 companies out sourced their software requirements to Indian software houses.
- Government has conventionally been recognised a key driver of domestic IT demand in India and even around the world. For example, in USA, about 23% of total domestic IT spending is derived from government and public sector units. However, in the year 1998-99, in India, Government spending constituted more than 28% of total IT spending.
- The major sectors which are witnessing a special thrust on adoption of IT are Central / State Administrations, Insurance, Banks, Energy, Financial Institutions, Defence, Public Tax System, Ports, Customs, Telecom, Education and Small Office Home Office / Individuals.
- Southern and Western states such as Andhra Pradesh, Tamil Nadu, Maharashtra, Karnataka in their drive to emerge as coveted Silicon Valleys in India and recognised as one around the world, contributed a large portion to total domestic IT spending. However, at the same time, many other states of India also announced major computerisation drives. These states included Gujarat, Kerala, Orissa, Delhi, Goa, Himachal Pradesh, West Bengal, Uttar Pradesh, Madhya Pradesh, Rajasthan, amongst others. As an instance to underscore the endorsement and gravity that the IT has acquired in India, Government of Jammu & Kashmir has drawn up plans to promote IT in state by inviting companies to set up

IT Enabled Services units in the state as well as encouraging extensive use of IT in the state administration as well as educational system. It also completes a missing link in the vision of making India a world class IT user.

India scores over other countries

A comparison amongst some countries in Asia Pacific based on these factors highlights the following : (ratings are on a scale of 1 to 3, with 1 being the lowest and 3 the highest)

Country	Workforce	Market Access	Local Market	Infrastructure	Cosmopolitan	Cost Base
New Zealand	2	2	-	2	3	2
Kuala Lumpur	1	2	-	2	2	2
Japan	2	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		

POTENTIAL FOR INDIA

As per a survey done by NASSCOM, IT Services can generate the following amount of revenue and employment for India in the next ten years.

IT Enabled Services	1998-99		2008 (Projections)	
	Employed	Rs. Crore	Can be Employed	Rs. Crore
Back Office Operations/Revenue Accounting/Data Entry/	9,700	420	2,60,000	19,000

Data Conversion				
Remote Maintenance and Support	1,600	65	1,80,000	13,500
Medical Transcription/Insurance Claims Processing	3,800	140	1,60,000	11,000
Call Centres	1,400	40	1,00,000	6,000
Database Services	1,000	45	1,00,000	6,500
Content Development	5,500	270	3,00,000	25,000
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 - The domestic call centre 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.

Medical Transcription

In countries like the USA, doctors' time is at high premium. The current practice is for doctors to simply record their findings through a dictaphone or some such device. These sound tracks are then sent through datacom lines to overseas companies (where costs are much lower) that employ "medical transcriptionists" who hear these recordings, transcribe them into reports and send them back electronically through datacom lines. This has now become a specialised discipline with people needing adequate training. Information and communication technologies are used to send the voice recordings on satellite lines to far-off, low cost locations, where these recordings are transcribed into reports which are again sent back to the hospitals or clinics digitally through the same lines and printed as reports locally. Turnaround time is often as low as two hours and, therefore, is often better than what the hospital may have achieved if it had done all of it in-house.

Initially, it was only being contracted out to companies that were in close proximity to these hospitals. Increasingly, however, to take advantage of lower costs, this work is being sent abroad to Mexico, West Indies etc. Because of the

availability of high speed satellite links, it is now entirely feasible to do this in India in technical terms. What is even more important is that the raw material in India is even more abundant in this field than in software, because all we need are graduates who have the ability to read and write English with reasonable comprehension abilities. Even better, such projects do not have to be set up only in the large cities, but can even go to the smaller cities in India. In the software field, it would take 5 - 7 years to create a company employing 1500 people, while in this area, this could be done just in 12 months. The social benefits are also much better, since the employment is not only for high price, high income level, but for the somewhat less economically privileged community. And of course, this is all export oriented and highly profitable.

Back Office Operations, Revenue Accounting, Other ancillary operations

Industries such as Banks, Airlines require large scale data entry and revenue accounting work to be done. For revenue accounting and other backoffice accounting operations, paper documents / raw data are sent to remote locations, which are used for data entry and necessary reconciliations. Using high speed datacom links for their back office and data processing operations, these banks, airlines and other organisations with extensive data turnover and customer interface, are able to save costs and valuable resources. The prime concern of these companies is 100% availability of data and uptime of facilities. This can be ensured through high speed datacom links from India to the parent country. In other words, such a centre could be realised simply as an offshore extension of existing information and backoffice operations promising constant availability.

Over the last few years, there has been a steadily growing trend to outsource these services to major IT service providers with contracts running into decades. The prime criteria for such projects is quality of organisational processes, availability of abundant manpower and ability to dedicate resources to clients' needs. India stands to gain from such a trend as Indian software industry has been able to make a mark and also has access to a huge pool of skilled as well as semiskilled professionals with relative cost advantage.

Insurance Claims Processing

Large insurance companies get myriads of claims. Since there are well laid down rules on how they are to be processed, such processing can be done anywhere, as long as there is availability of graduates who can read and write English in large numbers, a few doctors and a few accountants. As a result, to save costs, large insurance companies in the US are now outsourcing a lot of this work. This is another good opportunity area.

Legal databases

There is a constant need for lawyers who counsel cases to go through relevant laws, rulings and precedents in order to build up their case. This is usually done by very junior lawyers in legal firms. However, in the US and other developed countries, even junior lawyers' services are highly priced. One of the ways to get around this hurdle is to have a readily accessible source of well managed and intelligent information. One of the most promising and low cost way of having ready access to information is information technology. Therefore, many legal firms have started to outsource this work to organisations who have a large English speaking, lower priced workforce of trained lawyers. The job comprises of working closely with the firms to create a database of their existing records, index on the basis of various useful and common understood criterion, keeping track of new documents being created and incorporating them into database as per well established parameters. Lawyers can then simply use their computers to draw up a history of like cases and draw a clear plan of action. Once again, the rules are clear and only average qualifications and ability are required.

Digital Content Development / Animation

New Media content development is emerging as one of the fastest growing service segment in the global IT services industry. It caters to needs of web site management, production of content for new media such as Compact Disk, Digital Versatile Disk and products of convergent technologies such as internet enabled TV. It offers a large emerging potential; as more and more offices, homes, institutions, students and professionals realise an ever growing need to have easy access to information that can also be suitably fused with other media.

It consists of compilation and development of digital content for intra-organisation dissemination, cross-institution usage, collaborative projects, public domain information, programs for public / specialised education, web content development and management, developing animated movies. It typically involves defining a set of rules and norms for collection of data; collating various unorganised sources of data; sorting; indexing and sifting; compilation; conversion into digital format and disseminating to various users. In other types of digital content development, there is usually a contract between content provider and developer to review project on an ongoing basis such as cartoon movies, etc. Opportunities also include acting as an offshore content developer for organisations such as internet media companies and advertising organisations where there is a constant need for content development. It would also ensure that operations are not erratic. Especially, web content development is becoming a multi-billion dollar segment.

There are several other such areas where the potential is high. The acceptability of outsourcing such work to distant countries and the recognition of the cost savings is rapidly growing.

India is emerging as an attractive outsourcing destination to companies around the world in the software sector. What India now needs to do, is to replicate its success in the software sector in the sector of IT Enabled Services.

INDIA offers many advantages

India offers many advantages to serving as an IT Enabled Services destination for major global companies These include:

- i. A virtual 12-hour time zone difference with USA and other major markets for IT Enabled Services
- j. A huge pool of English speaking and computer literate graduate manpower who can continue to cater to the growing demand for professionals for IT Enabled Services. These professionals are skilled as well as quality conscious.
- k. Cost of qualified personnel is amongst the lowest in the world
- l. Stable legislative and economic framework
- m. Support of Government of India for all IT led industries
- n. Recently, Government of India announced a special policy for call centres in India.
- o. Many State Governments in India offer special incentives and infrastructure for setting up I.T. Enabled Services
- p. Thrust by Government of India to make India an IT-driven nation with a focus on services sector where potential for value addition and thus premium is higher.
- q. India enjoys very strong brand equity in major markets, thanks to its growing and globally competitive software industry

The proliferation of IT Enabled Services and its continuing demand-led growth may well emerge to be a strong opportunity for India, both in terms of generating employment and export.

As evident, IT Enabled Services is a major boon for India as it provides tremendous potential to provide employment opportunities and attract foreign investments. Amongst others, the benefits include:

- r. Generation of new direct or indirect investment
- s. Earning of Foreign Exchange leading to higher earnings of local staff
- t. More revenues to telecom carriers
- u. Introduction of new technology
- v. Transfer of skills to India
- w. Increase in competitiveness
- x. Improved parity of income levels in and far flung areas such as North East or Jammu & Kashmir.

SUMMARY

Thus, the potential for India is very high in the sector of I.T. Enabled Services. The opportunities exist in either setting up of independent ITES units or franchise of International companies or their vocational and training company.

Thus it is evident that different models can be adopted. Companies in India can adopt some of the following models for marketing their services and to grow relationships with long standing customers. These models would typically span over following schemes:

- y. **Multiple IT Enabled Services Training Institution:** Providing trained workforce for deployment in subsidiaries of foreign companies as well as Indian companies.
- z. **Vertically Integrated training plus services company:** The company can have an internal well managed loop of inducting new workforce and training them for outside employment as well as internal absorption. This is considered an ideal architecture.
- aa. **Sell-out:** Companies can enter into a long term alliance with customers that can assure of sustainable and growing revenue streams. Companies can offer the model of setting up the facility, establishing processes for workforce and services delivery; and harvesting. Harvesting comprises of maturing upto high quality service levels, reaping profits for a mutually decided period of time and then selling out over pre-negotiated or afresh negotiated terms. This is considered advantageous for both parties as it serves mutual interests.

It is evident that India is well positioned to take full advantage of this new revolution of I.T. Enabled Services and emerge as a Global Hub for these services.

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