CHAPTER – 2

IT INDUSTRY & HR CHALLENGES
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2.1 INFORMATION TECHNOLOGY INDUSTRY IN INDIA

2.1.1 INTRODUCTION:

*Information technology in India* is an industry consisting of two major components: IT Services and IT enabled services (ITES), more commonly known as Business Process Outsourcing. The Indian IT and ITES industry is divided into four major segments – IT services, Business Process Management (BPM), Software products and Engineering services, and Hardware. The Information Technology industry has gained a brand image as knowledge economy because development from software exporter to providing IT services to IT enabled services (BPO segment). The Indian IT sector is expected to develop at a rate of 12-14 % for FY2016-17 in constant currency terms. The sector can be expected triple its current annual revenue to attain US$ 350 billion by FY 2025(National Association of Software and Services Companies (NASSCOM).

India's technology and BPM sector (including hardware) is likely to generate revenues of US$ 160 billion during FY16 in comparison to US$ 146.5 billion in FY15, implying a growth rate of 9.2 per cent. The contribution of the IT sector to India's GDP rose to approximately 9.5 % in FY15 from 1.2 % in FY98. The cities that account nearly 90% of the sectors exports are Banglore, Chennai, Hyderabad, Delhi, Mumbai and Kolkatta. IT industry has registered a distinctive growth because of the rich and varied expansion into verticals, well –differentiated service offerings and increasing growth penetration.

The phenomenal success of the industry is due to favourable government policies, rich and burgeoning demand conditions, healthy growth of the related industries and competitive environment prevalent in the industry. The interplay of the forces has put a on the global map. The IT & ITES industry in India has today become a growth engine for the economy, contributing substantially to increases in the GDP, urban employment and exports, to achieve the vision of a powerful and resilient India. Indian firms, across all other sectors, largely depend on the IT &ITES service
providers to make their business processes efficient and streamlined. Indian manufacturing sector has the highest IT spending followed by automotive, chemicals and consumer products industries.

2.1.2 EVOLUTION OF IT INDUSTRY

The gradual evolution of IT industry in India can be understood by looking at the figure.1. The four stages clearly depict gradual growth and expansion of this sector.

**Figure 2.1 IT Industry Evolution**

![IT Industry Evolution Chart](source: ibef.org)

2.1.3 INDIA – THE IT HUB

Over the past decade, the Information Technology (IT) industry has become one of the fastest growing industries in India, propelled by exports. The key segments that have contributed significantly (96 percent of total) to the industry's exports include - Software and services (IT services) and IT-enabled services (ITES) i.e. business services. Over a period of time, India has established itself as a preferred global sourcing base in these segments and they are expected to continue to fuel growth in the future. Exports contribute significantly to the Indian IT industry's revenues with key segments being IT services and software and ITES- BPO. Indian IT
and ITES companies have created global delivery models (onsite, near shore, offshore), entered into long term engagements with customers, expanded their portfolio of services offerings, built scale, extended service propositions beyond cost savings to quality and innovation, evolved their pricing models and have tried to find sustainable solutions to various issues such as risk management, human capital attraction and retention and cost management.

A key demand driver for the Indian IT services and ITES industry has been the changing global business landscape which has exerted performance pressures on multinational enterprises. While companies initially sourced from the Indian IT and ITES industry for cost, quality and enhanced competitiveness have induced them to continue and expand. Some companies have also viewed sourcing differently (beyond cost and quality) and achieved non-traditional benefits of sourcing from India.

Though exports dominate the industry, the domestic market is also significant with a robust revenue growth. India’s total IT industry’s (including hardware) share in the global market stands at 7 per cent; in the IT segment the share is 4 per cent while in the ITES space the share is 3 per cent. The industry is dominated by large integrated players consisting of both Indian and international service providers. Indian IT's core competencies and strengths have placed it on the international canvas, attracting investments from major countries. More recently, online retailing, cloud computing and e-commerce are the major driving forces behind the rapidly increasing growth in the IT industry.

2.1.4 TOP 10 IT COMPANIES IN INDIA - 2016

(On the basis of Market Capitalization: Source -http://alpingi.com)

A. TATA CONSULTANCY SERVICES

It was started way back in the year 1968. Presently TCS has numerous projects of domestic and international organizations worldwide. TATA CONSULTANCY SERVICES provides various services that include IT Services, Business Processing Services, Consulting, Social Computing, Business Intelligence, etc. The major sectors where TCS operates are Banking, Travel, Healthcare, Insurance, Telecom and Hospitality. TCS is a part of India’s Premier Business Group, Tata Group and has its
operations in more than 40 countries across the globe. TCS is way ahead and no 1 in the list of top 10 IT companies in India.

B. INFOSYS

Winner of many awards, Infosys was founded in the year 1981 and since its inception has continuously provided quality products and services to its clients worldwide. Infosys provides wide variety of services that include Management Consulting, Business Process Outsourcing, Software Testing, Engineering Services, Business Applications, etc. Besides these, Infosys also offers its services in Hospitality, Retail, Communication, Education and Insurance.

C. WIPRO

Wipro was founded in the year 1945 and it delivers numerous services that include Cloud Management Service, HR Outsourcing, Data Integration, Testing Service, Digital service etc. The main sectors where Wipro offers its services include Manufacturing, Banking, Automotive, Retail and Transportation. Wipro is a prominent IT company based in India offering its services in more than 6 continents across the world.

D. HCL TECHNOLOGIES

HCL Technologies, a renowned name in the Indian IT sector was founded in the year 1976, HCL offers its services to numerous sectors that include Government Organization, Electronics, Telecom, Retail, Manufacturing, etc. HCL Technologies has its operations in more than 25 countries worldwide. Major part of HCL Technologies revenues are Cloud Computing, Network Services, Business Process Outsourcing and Testing Services.

E. TECH MAHINDRA

Winner of Porter Prize, Tech Mahindra was founded in the year 1986 and presently has operation in more than 50 countries across the world. Tech Mahindra delivers a wide range of services that include Software Testing, Network Services, Web Content Management, Business Applications, etc. Tech Mahindra also has strong presence in sectors like Hospitality, Banking, Telecom, Insurance, Retail, etc.
F. ORACLE FINANCIAL SERVICES

Oracle Financial Services was founded in the year 1990. It is the part of Oracle Corporation and is among the leading IT companies in India. Oracle Financial Services is one of the fast growing IT giant in India having its presence in about 100 countries in the world.

G. MINDTREE

Mindtree was founded in the year 1999 and presently has its presence in more than 10 countries across the globe. Mindtree offers its services to clients in Banking, Manufacturing, Retail, Finance, Hospitality and Travel sectors. Mindtree is strong in the areas of Data Analytics, Automation Testing, Cloud Computing, Application Management Services, etc.

H. MPHASIS

Mphasis was started in the year 2000 and within a short period of time, has emerged as leading IT Company in India. Mphasis has operations in North America, Europe, India, Australia, etc. Mphasis delivers various services that include Business Process Outsourcing, Testing Services, Application Development, Network Services, etc.

I. HEXAWARE TECHNOLOGIES

Hexaware Technologies, winner of Golden Peacock Award for Excellence in Corporate Governance, has more than 10,000 employees that deliver excellent services to its clients across the globe. Hexaware Technologies has ninth rank in the list of top 10 IT companies in India. Some of the industries to which Hexaware Technologies offers its services are Manufacturing, Banking, Retail, Insurance and Travel.

J. TATA ELXSI

Tata Elxsi was established in the year 1989 that offer services like technology services, systems integration services, visualization and content development, etc. Automotive, Healthcare, Consumer Electronics and Retail are some of the sectors in which it has its presence.
2.1.5 CONCENTRATION OF IT / ITES ACTIVITY

A majority of IT / ITES activity in India is concentrated in seven cities / clusters in India. With concerted development efforts of a wider base of cities / towns, the geographical spread of IT / ITES activity is gradually expanding to cover cities such as Ahmadabad, Jaipur, Coimbatore, Kochi, Trivandrum, Chandigarh, Mysore, Mangalore, Madurai and Bhubhaneswar. Various companies have chosen to locate their operations in one or more of these seven clusters based on parameters such as:

- Leveraging local experience and assets
- Spreading to reach right skills at right costs
- Business continuity requirements

Table No. 2.1 IT Clusters and Key Companies

<table>
<thead>
<tr>
<th>Information Technology Clusters City / Cluster</th>
<th>Key companies in the location (Illustrative and not exhaustive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mumbai / Navi Mumbai / Thane</td>
<td>ABN Amro, Morgan Stanley, Citigroup, Accenture, Tata Consultancy Services, World Network Services (WNS)</td>
</tr>
<tr>
<td>(Gurgaon / New Delhi / Noida)</td>
<td>Genpact (formerly GE Capital International Services), Sapient, HCL Technologies, American Express, McKinsey research centre, E-Funds Corporation</td>
</tr>
<tr>
<td>Bangalore</td>
<td>JP Morgan, Goldman Sachs, Siemens, Infosys, Wipro, Tata Consultancy Services, Cognizant Technology Services, Genpact (formerly GE Capital International Services)</td>
</tr>
<tr>
<td>Chennai</td>
<td>Citigroup, Standard Chartered (Scope International), World Bank, Ford, Hewlett Packard, AIG, Infosys, Tata Consultancy Services, Cognizant Technology Services</td>
</tr>
<tr>
<td>Hyderabad / Secunderabad</td>
<td>HSBC, Microsoft, Franklin Templeton, Infosys, Wipro, Tata consultancy services. Cognizant Technology Services, Genpact (formerly GE Capital International Services)</td>
</tr>
<tr>
<td>Pune</td>
<td>World Network Services, Cognizant Technology Services, HSBC, Veritas, Sybase, AXA, Mellon Financial</td>
</tr>
<tr>
<td>Kolkata</td>
<td>HSBC, Genpact (formerly GE Capital International Services), IBM, Infosys, Tata consultancy services, Cognizant Technology Services</td>
</tr>
</tbody>
</table>

2.1.6 IT INDUSTRY SEGMENTATION

IT industry can be broadly classified into three sectors: Software, IT Services & IT enabled Services.

Figure 2.2 Indian IT Industry Segmentation

2.1.7 CONTRIBUTION TO THE ECONOMIC GROWTH IN INDIA

In the last two decades, the Indian IT/ITES industry has contributed significantly to Indian economic growth in terms of GDP, foreign exchange earnings and employment generation. However, equally significant though not as tangible, has been the ripple effect it has created on the general economic environment in the national and international economic space. The industry has been the trigger for many “firsts” and has contributed not only to unleashing the hitherto untapped entrepreneurial potential of the middle class Indian but also taking Indian excellence to the global market.
**Direct Contribution to the Indian Economy**

The emerging role of the industry in the Indian economy is well established. IT & ITES is considered as the fastest growing segment among the services sector, which in turn fuels the key economic indicators of the country. Some of the indicators where there is a direct contribution are:

(i) Growing Share of the Country’s GDP

(ii) Growing Exports Boost the Foreign Exchange Reserves

(iii) Generating Employment Opportunities

**Indirect Contribution to the Indian Economy**

The growth of the IT/ITES sector and its resultant contribution to the economic growth and development has also resulted in certain wider impacts, which in many cases have had a rub-off effect and set benchmarks for other sectors of the economy while boosting the image of India in the global market. The major indirect contribution includes:

(i) Enhancing The Image Of India In Global Market

(ii) Education

(iii) Enabling Wealth Creation and Asset Building

(iv) Infrastructure and Other Amenities

(v) Fuelling Growth of PE/VC Fund

(vi) Spurring First Generation Entrepreneurship

(vii) Improving the Product/Service Quality Level

(viii) Impact on Employment Practices

(ix) Additional employment generation

(x) Driving growth of other sectors of the economy

(xi) Encouraging balanced regional development

(xii) Front runner in practicing good corporate governance
2.1.8 PRACTICES ADOPTED BY IT/ITES COMPANIES

The fast growing IT/ITES industry has been struggling with several issues concerning availability and quality of talent. The industry has responded to this issue by evolving sustainable and innovative solutions. Since the educational institutes lagged behind in supplying the requisite number of trained people required for the industry and their curriculum could not keep pace with the changing trends in technology, the IT/ITES industry themselves came forward and made massive in-house training investments, which helped them power their growth and compete at par with international giants in the global market.

The industry has also gone beyond and collaborated with the government, private educational institutions as well as industry associations to contribute towards capacity building, skill development and continual training of existing and potential employees to enhance their capabilities and competitive skills. The industry is also making efforts to ensure that employees are provided a stimulating and healthy working environment for improving their level of satisfaction and productivity.

The following are some of the best practices followed by Indian IT industry:

(i) Promoting women empowerment:

The growing trend in the number of women employed in this sector indicates that not only does the industry offer equal opportunity to women but also has in place proactive and sensitive mechanisms which counter the common causes that discourage women from pursuing employment in the corporate sector. Women employment in the industry is set to rise to 45% by 2010 from the current 30%.

(ii) Providing high growth opportunities for the youth:

The industry has created excellent employment and fast track growth opportunities for the younger section of the population and is likely to become one of the largest employers’ of a growing ‘young population’ of India. The overall median age group of the sector is 28.9 years with 70% of the workforce being in the age-group 26-35 years.
(iii) **Training of workforce:**

The industry has played a pioneering and pro-active role in developing the talent pool in the country by forging links with the academia and the Government. It has not restricted its efforts to developing its own employees but is also investing in raising the overall standard of education. The industry has collaborated with academic institutions for bridging the gap between the education imparted to students and the actual requirements in the job scenario. Collaborations have been in the areas of curriculum development and course design, training for students. NASSCOM has been involved in developing standards for training and recruitment at entry level to make students more employable. These training address both the technical and soft skills training needs. Companies on an average conduct 163 training programmes annually; with almost 80% spend on training entry level hires.

(iv) **Promoting higher education:**

The industry has emphasized upon developing its workforce by encouraging and aiding up-gradation of skills and abilities. It has done so through various means including provision of scholarships as well as training and development activities. Many companies have tie-ups with educational institutes for supporting the higher education needs of their employees and provide full/partial scholarships thus supporting their career goals. NASSCOM has been involved in building the talent base for high end skills in areas like multimedia convergence and bio-informatics while working with the Ministry to develop institutes that produce highly specialized professionals.

(v) **Improving the work environment:**

IT/ITES companies have been taking the lead in providing a highly conducive work environment to employees leading to increased productivity and better morale. The facilities provided focus on health of employees by providing gymnasium; yoga/meditation facilities as well as their safety through pick and drop facilities. To cater to the need of providing a work-life balance, particularly to women employees, the companies offer flexible working hours and work from home option.
Table No.2.2 Factors favouring India as the preferred destination for IT services

<table>
<thead>
<tr>
<th>S.No</th>
<th>Parameters</th>
<th>Weight</th>
<th>Criticality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Cost – value</strong></td>
<td>20%</td>
<td>Vital</td>
</tr>
<tr>
<td>1.1</td>
<td>Cost per transaction / seat /FTE</td>
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</tr>
<tr>
<td>1.2</td>
<td>Payment terms (from Invoice date)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Additional Charges (if any)</td>
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<td></td>
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<tr>
<td>1.4</td>
<td>Termination Clause (in days)</td>
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<tr>
<td>2</td>
<td><strong>Scalability</strong></td>
<td>10%</td>
<td>Vital</td>
</tr>
<tr>
<td>2.1</td>
<td>Infrastructure for uninterrupted service</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>Provisioning for additional capacity</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Infrastructure for additional capacity</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>List of circles where the Partner can provide</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>Financial Strengths (Turnover, Assets etc)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>Technical Compatibility</strong></td>
<td>10%</td>
<td>Vital</td>
</tr>
<tr>
<td>3.1</td>
<td>Voice Connectivity for Call delivery</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>Data Connectivity for access to CRM and Other</td>
<td>2</td>
<td></td>
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<tr>
<td>3.3</td>
<td>ACD/ PBX technology with Compatibility</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3.4</td>
<td>Voice Logger with business Compatibility</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3.5</td>
<td>Reporting tools with Compatibility</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><strong>Industry Experience</strong></td>
<td>5%</td>
<td>Essential</td>
</tr>
<tr>
<td>4.1</td>
<td>Experience in respective domains</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4.2</td>
<td>List of circles in which franchise currently</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><strong>Language</strong></td>
<td>10%</td>
<td>Vital</td>
</tr>
<tr>
<td>5.1</td>
<td>Availability of Multi-lingual Manpower</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>5.2</td>
<td>Availability for Voice Process</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5.3</td>
<td>Availability for Non-Voice Process</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><strong>Data security</strong></td>
<td>7%</td>
<td>Vital</td>
</tr>
<tr>
<td>6.1</td>
<td>Measures to ensure data security</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>6.2</td>
<td>Data security solutions – Anti Virus solutions</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><strong>Existing relationship</strong></td>
<td>10%</td>
<td>Desirable</td>
</tr>
<tr>
<td>7.1</td>
<td>Tenure of association with Major players</td>
<td>5</td>
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Contd,
<table>
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<tr>
<th></th>
<th>Description</th>
<th>Weight (%)</th>
<th>Importance</th>
</tr>
</thead>
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<tr>
<td>7.2</td>
<td>Performance of processes currently handled by existing Partner Credentials</td>
<td>5</td>
<td>Desirable</td>
</tr>
<tr>
<td>8</td>
<td><strong>Credentials</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.1</td>
<td>COPC Certification</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8.2</td>
<td>ISO 9000, ISO 27001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8.3</td>
<td>Six Sigma</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8.4</td>
<td>RBNQA</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8.5</td>
<td>NASSCOM Membership</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><strong>Statutory Compliance</strong></td>
<td>10</td>
<td>Vital</td>
</tr>
<tr>
<td>9.1</td>
<td>PAN Card</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>9.2</td>
<td>Service Tax Registration</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>9.3</td>
<td>PF Registration</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9.4</td>
<td>ESI Registration</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9.5</td>
<td>MOA/ Partnership deed</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><strong>Regulatory Compliance</strong></td>
<td>8</td>
<td>Vital</td>
</tr>
<tr>
<td>10.1</td>
<td>OSP License</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>10.2</td>
<td>Telemarketing License</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>10.3</td>
<td>STPI Debonding Certificate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10.4</td>
<td>Authorized Signatory Resolution</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td><strong>Ramp Up/ Down Capability</strong></td>
<td>5</td>
<td>Desirable</td>
</tr>
<tr>
<td>11.1</td>
<td>Deployment of additional capacity</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>11.2</td>
<td>Time Required capacity expansion</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>11.3</td>
<td>Time Required for ramp down</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td>100</td>
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</tr>
</tbody>
</table>

*(Source: NASSCOM)*
Various country comparison studies have established the attractiveness of the Indian IT services and ITES industry. The key attributes that have enabled India to establish itself as a preferred sourcing base include:

(i) **Vast Access to skill base**

- Large pool of resources for IT and ITES operations - 14 million graduates, 1 million technical resources, one of the largest English speaking manpower in the world.
- Availability of quality delivery management talent from international banks and consulting firms.
- In the future, while the increasing demand for resources may put pressure on the resource base, initiatives are currently underway to enhance the supply of quality human capital in the country.

(ii) **Strong quality orientation**

- ISO9001, COPC.6 sigma are some of the established quality initiatives.
- 90 out of the world’s 117 SEI CMM Level 5 companies are from India.

(iii) **Availability of high quality infrastructure**

- Concerted efforts to provide dedicated, international quality, cost effective real estate at software parks, Special Economic Zones (SEZ) and knowledge sector industrial estates.
• Availability of high quality international and national dedicated telecom infrastructure with high level of redundancies insulating centres from Public Switched Telephone Network (PSTN) quality.
• Availability of multiple levels of backups providing insulation from public system issues, if any.

(iv) Cost advantage

The cost impact of sourcing from the Indian IT and ITES industry can be significant due to the lower wages and lower cost of living. While the increasing demand for resources is gradually adding pressure on labour costs, companies within the industry are attempting to sustain cost, competitiveness through appropriate location choices and revamped human resource management practices.

(v) Enabling policy environment

The Government of India is taking proactive measures to encourage investments in this sector. Significant measures and incentives include a liberalized FDI regime, single-window clearance facility, income tax holiday and customs duty exemptions. State governments too are demonstrating a proactive approach towards attracting and facilitating investments and are providing support for the development of specialized infrastructure, focusing on development of a larger base of cities/towns to meet the needs of the industry and undertaking measures to continually enhance the supply and quality of manpower.

(vi) Mature industry eco-system

The support infrastructure for the Indian IT and ITES industry which includes specialized firms for functions such as recruitment, training, property management, security, fleet management, book-keeping and payroll as well as industry associations has evolved over the years.
(vii) **Commitment to address security concerns**

Indian companies as well as the government have been active in adhering to international security standards such as ISO 17799, BS7799, COBIT and ITSM. The required legal framework has been laid down by the government and a revamp of the country's Information Technology Act, 2000 is expected in the near future. The revised legal framework is likely to include provisions against a new range of computer crimes to cover areas like privacy, information protection and harming computer systems through viruses.

### 2.1.10 GROWTH DRIVERS OF IT INDUSTRY:

The following figure explains the key drivers of growth in IT Industry.

**Figure 2.4 Growth Drivers**

![Diagram of Growth Drivers](image)

*Source: Nasscom, TechSci Research 2016*

### 2.1.11 GLOBAL IT INDUSTRY GROWTH PROJECTIONS:

CompTIA projects global IT industry growth of 4.1% in 2017. If this growth materializes, it will push the $3.4 trillion global IT industry past the $3.5 trillion mark by the end of the year.
2.1.12 GOVERNMENT INITIATIVES

In the Union Budget 2017-18, the Government of India announced these key proposals:

- The Government of India has allocated Rs 10,000 crore (US$ 1.5 billion) for Bharat Net project under which it aims to provide high speed broadband to a lot more than 150,000 gram panchayats by 2017-18.

- Prime Minister of India, Mr Narendra Modi, has launched the Bharat Interface for Money (BHIM) app, an Aadhaar-based mobile payment application which will allow users to produce digital payments without having to use a credit or debit card. The app has reached the mark of 10 million downloads.

A number of the major initiatives taken by the federal government to support IT and ITeS sector in India are stated below:
Mr Ravi Shankar Prasad, Union Minister of Law & Justice and Information Technology, has launched a free Doordarshan DTH channel called Digi Shala, which will help people understand the use of unified payments interface (UPI), USSD, aadhaar-enabled payments system, electronic wallets, debit and credit cards, thereby promoting various modes of digital payments.

The Government of India plans to revamp the United Payment Interface (UPI) and Unstructured Supplementary Service Data (USSD), to produce it easier for consumers to transact digitally either with or without an Net connection with desire to of strengthening its push towards making India an electronic digital economy.

The Telecom Regulatory Authority of India (TRAI) will soon release consultation papers ahead of framing regulations and standards for the rollout of fifth-generation (5G) networks and Internet of Things (IoT) in India.

The Government of Gujarat has signed 89 MoUs worth Rs 16,000 crore (US$ 2.3 billion) in the IT sector, during Vibrant Gujarat Global Summit-2017.

The Government of Telangana has signed an agreement with network solutions giant Cisco Systems Incorporation, to cooperate on a bunch of technology initiatives, including Smart Cities, Internet of Things, cyber security, education digitisation of monuments.

The Railway Ministry plans to offer an electronic digital push to the India Railways by introducing bar-coded tickets, Global Positioning System (GPS) based information systems inside coaches, integration of all facilities working with ticketing issues, Wi-Fi facilities at the stations, super-fast long-route train service for unreserved passengers among other developments, which will raise the passenger traffic.

The Pune Smart City Development Corporation (PSCDCL) has signed a Memorandum of Understanding (MoU) with the European Business and Technology Centre (EBTC), that will let it gain access to real-time understanding of technologies, solutions and best practices from Europe.
• The Human Resource Development (HRD) Ministry has entered into a partnership with private companies, including Tata Motors Ltd, Tata Consultancy Services Ltd and real-estate firm Hubtown Ltd, to open three Indian Institutes of Information Technology (IIITs), through public-private partnership (PPP), at Nagpur, Ranchi and Pune.

• Government of India is planning to produce five incubation centres for IoT start-ups, as a part of Prime Minister Mr Narendra Modi’s Digital India and Startup India campaign, with at least two centres to be setup in rural areas to produce solutions for smart agriculture.

• The Government of India has launched the Digital India program to provide several government services to the people using IT and to integrate the federal government departments and the people of India. The adoption of key technologies across sectors spurred by the Digital India Initiative could help boost India's Gross Domestic Product (GDP) by US$ 550 billion to US$ 1 trillion by 2025.

• India and the US have consented to jointly explore opportunities for collaboration on implementing India’s ambitious Rs 1.13 trillion (US$ 16.58 billion) ‘Digital India Initiative’. The two sides also agreed to put on the US-India Information and Communication Technology (ICT) Working Group in India later this year.

2.2 HR CHALLENGES IN IT INDUSTRY

2.2.1 INTRODUCTION

The Information Technology (IT) industry is a dynamic and people based organization where the role of HR management is very crucial and different. The Indian software industry attracted such global interest with the Y2K computer crisis or the millennium bug in 2000, that organizations worldwide needed computer-remediation and Indian software engineers were able to provide superior technical services worldwide (Meredith, 2008).
Indian software professionals worked closely with several multinational companies (MNCs) on Y2K projects and created high visibility and established incredible credibility for the entire software industry. The quality of work that Indian employees delivered was rated very high and the software industry was identified as one of the best in the world today (Friedman, 2005). The software industry’s phenomenal growth has brought several human resource management (HRM) challenges right from elaborate staffing to high attrition (Friedmann et al., 2008).

2.2.2 Research Studies on HR Challenges in IT Industry

Agrawal, N.M & Thite, M. (2003), investigated the characteristics of Indian software professionals and identified some of the key HR related issues and challenges. These include:

1. Voluntary attrition,
2. Reluctance to make a transition from technical to management positions,
3. Lack of managerial skills,
4. Difficulties with team work,
5. Work preferences and maintaining work-family balance

They have also suggested some good strategies to deal with HR issues and challenges. Since IT industry is building a knowledge society, the people who are working in IT should keep on updating their knowledge. But across the globe the people skills for appropriate roles are not sufficient. The skill gap is always being a biggest problem in IT industry. The employees in IT industry need to keep abreast of new technologies.

Narendra M. Agrawal, Naresh Khatri, R. Srinivasan (2012), identified several HR management challenges after the global recession in 2008. These include:

1. Managing human resources in globally distributed team.
2. Shortage of software professionals having sufficient knowledge and competencies.
3. Low-skilled nature of the work.
4. Lack of well-developed HR systems and processes.
5. High employee turnover.
6. Lack of work-life balance and
7. Problems associated with the use of contract employees.

They have also developed a model to overcome these challenges.

**2.2.3 Analysis of HR Challenges:**

**Attracting the best talent:**

The Indian software industry suffers from a shortage of experienced personnel for key positions such as systems analysts, project managers etc., and attracting them is a key challenge. Software companies are striving to understand which organizational, job and reward factors contribute to attracting the best talent. Entry level hiring is subjected to several tests such as logical, analytical and communication skills and interviews. The job attrition rate is around 15 to 20%, which further gets amplified at the lower and mid management level (Friedmann et al., 2008). Indian employees prefer to work for software companies that are identified as the employers of choice (Chokkar, 2007; Brandel, 2006; Agrawal and Thite, 2003). Therefore, employer branding becomes an integral part of the recruitment strategy. Finally, recruiting for midlevel and senior managers is quite a challenge for both domestic and multinational software companies.

**Training:**

The knowledge, skills and abilities (KSAs) of this dynamic industry are constantly changing, predicting the skills “even two quarters away” seems quite a big challenge. Organizations rely on line managers’ judgmental techniques to predict future staffing requirements. (Nancherla, 2008; Agrawal and Rao, 2002) entry-level employees need intense training or a “finishing school” touch to integrate and transit into the corporate. The Indian educational system also does not sufficiently prepare its graduates for business skills which organizations provide like a “surrogate educational” system (Wadhwa, 2008; Nancherla, 2008).

Martinez (1997) explained that successful business leaders must also analyze how economic and societal changes will affect their businesses now and in the future. The IT industry is a service industry. How well you are able to offer quality service to individuals and organizations will determine the success of your organization. This
leads us to the fact that the creativity, innovativeness, knowledge and skills of your employees are your important assets. Effective management of these assets is the challenge that the IT industry is facing.

**Integration with Business Goals**

Turner (2006) examined the context of the role, the needs and opportunities arising from this context and the challenges of becoming a business partners, which are grouped into business challenges like global competition, advances in technology; organizational challenges like alignment of mission, vision, strategy, structure, systems and values; people challenges like attracting, selecting, assessing, appreciating, motivating, challenging, developing, promoting, listening to, supporting, measuring and rewarding. This approach is vital in making sound strategic business decisions. Qualitative people with embedded interests are the key to success for IT companies.

**Internationalization and migration associated challenges**

Globalization has made Indian IT distinct from other industries in terms of network externalities, diaspora effects, skill and knowledge spill overs, and repeat migration effects. Temporary mobility has been an important characteristic of the industry (Commander, 2008). Indian Software industry has resulted in internationalization of economic activity growth in capital flows and labour across borders. Although there was evidence of some wage pressure at the height of the IT boom, this has been subsequently abated. This is partly due to the industry downturn in developed countries, and also due to outward shifts in the domestic skilled labour (OECD, 2012). The US has always been India's largest trade partner, source of foreign money investment, and external job opportunities. Any downfall or slowdown of the US economy is likely to hurt India.

**Ageing problem**

Ageing is a growing concern in the Indian IT Services. The very people who created wealth for this Industry now face obsolescence threat. Professionals move from 'technical' to 'management' roles over time. This makes it difficult for the IT companies to find right roles for the aging professionals as there are not many managerial roles in a pyramidal organization structure. Combined with this companies
try to improve the bottom line through employment of young professionals who cost less for routine technical roles. Importantly studies have commented upon the ageist nature of software work. As it is found in research, when software workers get beyond the age of 40, they find it increasingly difficult to find new employment. Regardless of skill sets, they are more dependent on their organisation to maintain employment in the industry (Marks and Scholarios, 2007).

**Workforce Retention and Motivation**

Retention and motivation of personnel are major HR concerns today. Gartner Group Company devoted to management of human capital in IT organizations has observed that the common tenure for an IT professional is less than three years. Further, the utilization of new technologies, the support of learning and training, and a difficult environment ranked more than competitive pay structures as effective retention practices. In a recent survey of 1028 software professionals from 14 Indian software companies, indicated that while the professional gave importance to personal and cultural job-fit, HR managers thought that the main element to retention was salary and career satisfaction. Money was a leading motivator for starters, but also for those within their third or fourth jobs, their value-addition to the business was more important. Monetarily, offering the very best salaries in industry could be the minimum every company is doing, aside from performance-based bonuses, long-service awards, and stock options. Many organizations frequently conduct employee satisfaction and organization climate surveys, and are setting up Manpower Allocation Cells (MAC) to assign the right project to the right person. In reality, some are even helping employees using their personal and domestic responsibilities to satisfy & motivate their workforce.

**Compensation and Reward**

Increasing demands of technology along with a short way to obtain professionals (with the requisite expertise) has increased the expense of delivering the technology. This makes incentive compensation a significant feature, with the result that software companies have moved from conventional pay-for-time techniques to a combination of pay-for-knowledge and pay-for-performance plans. With the determinants of pay being profit, performance and value-addition, emphasis is currently on profit sharing (employee stock option plans) or performance-based pay,
keeping because the long-term organizational objectives as opposed to short-term production-based bonuses. Skills, competencies, and commitment supersede loyalty, hard work and length of service. This pressurizes HR teams to devise optimized compensation packages, although compensation isn’t the motivator in this industry.

**Culture of Sharing and Learning as a Team**

Business can just only be successful if leaders and their teams are collaborating between themselves. They’re learning and sharing the data to develop as an individual team instead of different business units. HR professionals play a vital role here, during short listing candidates they look for mind-set who is able to adjust within company environment, bring positive attitude, and potentially turn into a leader.

**Cross-Functional Resource Balance**

It’s required for HR professionals of the businesses which can be operating across the world to maintain a balance between the benefits fond of workforces deployed at different client locations and those placed at main development centre of the company. In addition to this, balance is required between those people who have been working from years and those people who have joined recently. Balance at hierarchy level (top heavy or flat) can also be must and should be coordinated with business goal.

**Upgradation of skills through Retraining**

Rapid and unpredictable technological changes and the increased exposure of quality of services are compelling software businesses to recruit adaptable and competent employees. Software professionals themselves expect their employers provide them with the training they may require in order to perform not merely within their current projects, but additionally in related ones that they could subsequently hold within the organization. As observed by Watts Humphrey, Fellow of the Carnegie Mellon University, "as software professionals gain competence, they do not necessarily gain motivation. The reason being a creative engineer or scientist who has learned how to perform something has little curiosity about doing it again. Once they've satisfied their curiosity, they could abruptly weary and seek an immediate change ".And once the rate of technological change is high may be higher than the
time required to get competence in a single area professionals could undergo psychological turbulence owing to the necessity to work in a new technology throughout their career. They would like to gain new knowledge, which is utilized by their organization. On the cornerstone of the newest learning they want to work in higher segments of software value chain. Therefore, constant up-gradation of employee skills poses yet another challenge for HR personnel.

HR practitioners should also play a proactive role in software industry. As business partners, they want to keep yourself informed of business strategies, and the opportunities and threats facing the organization. As strategists, HR professionals require to achieve integration and fit to an organization's business strategy. As interventionists, they have to adopt an all-embracing approach to understanding organizational issues, and their impact on people.

Compliance

It's anticipated that 2017 will take in lots of useful changes in labor laws, rules, and regulation. Develop these changes simplify the management of payroll and statutory compliance; however, keeping updated with such changes is a challenge. As HR managers are generally busy in recruitment and training, they may not need sufficient time to test & understand legislative changes and implement them accordingly. Maintaining the changing legislation thus becomes cumbersome.

2.2.4 ENVIRONMENTAL FACTORS AND THEIR INFLUENCE ON HR:

Figure 2.6 : Environmental factors influencing Indian IT organization

The above figure vividly describes various environmental factors and how they pose challenges to HR is presented in the table below.
<table>
<thead>
<tr>
<th>H R Value Chain</th>
<th>Environmental Complexity</th>
<th>H R Challenges</th>
</tr>
</thead>
</table>
| Recruitment     | • Variation in education and training facilities in the country  
                  • Pool of computer science graduates  
                  • Large pool and a mix of engineering graduates  
                  • Several competing firms for the same resources | • Recruiting in large numbers  
                  • Recruiting the best  
                  • Quality and concerns of employability  
                  • Constraints in terms of wage policies  
                  • Offer to join ratio  
                  • Lack of robust selection process  
                  • Validity of credentials of experienced professionals |
| Training        | • Inadequate engineering education Recency of software engineering discipline  
                  • Fast changing technology | • Large scale training programmes  
                  • Quality of training due to faculty shortage  
                  • Hiring the right faculty  
                  • Updating with the latest technology needs |
| Deployment      | • Fluctuating demand for IT services  
                  • Dependence on the US market  
                  • Niche skill requirements  
                  • Leadership deficit | • Matching project requirements  
                  • Managing the unallocated resources  
                  • Shortage or high cost resources |
| Mentoring and Career Planning | • Stressful work environment  
                  • Not well defined technical ladder  
                  • Conflicting need for technical career and management growth  
                  • Concern of ageing employee | • Ways to minimize stress  
                  • Satisfy conflicting employee needs  
                  • Attrition and lay off issue |
| Performance Appraisal | • Ambiguous work measurement systems  
                  • Large teams  
                  • Bell curve used for rating performance of large teams  
                  • Project and team based nature of software development work making performance rating difficult | • Difficulty in managing and assessing large number of associates  
                  • Appraised by managers who are sometimes not their supervisors  
                  • Associates preferring to go into management stream  
                  • Normal curve approach leading to attrition and dissatisfaction |
| Attrition and Layoff | • Fluctuating business demands in IT causing wage peaks and lows  
                  • Forced layoff during lean period  
                  • Resignations during boom period | • Retaining talent in good times  
                  • Engaging talent productively in bleak times |

Source: ASCI Journal of Management, March 2014
2.3 CONCLUSION

The IT industry has played a key role in transforming India’s image from a slow moving bureaucratic economy to a land of innovative entrepreneurs. IT industry has grown to US dollar 146 billion in 2016-17, with the annual growth rate not sliding below 50% since 1991. The Information Technology (IT) and Information Technology enabled Services (ITES) industry has been one of the key driving forces fuelling India's economic growth. IT is one of the world’s fastest growing economic activities, which envisages easier flow of information at various levels in the desired pattern. These services provide a wide range of career options that include opportunities in call Centre, medical transcription, medical billing and coding, back office operations; revenue claims processing, legal databases, content development, payrolls, logistics management, GIS (Geographical Information System), HR services, web services etc. To protect and safeguard the interest of the parties involved, it is widely believed that good Corporate Governance can raise efficiency and growth. Considering the significant role Information Technology industry plays in India, various issues and challenges it faces need to be addressed in the larger interest. The HR challenges in particular could be well addressed if the top management takes keen interest in the HR activities and supports the HR department for periodic assessment using HR Audit tools.
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