An Overview of the Indian Software Industry Profile, R&D features and Future

Global ICT industry: changing landscape? - The future of European ICT R&D

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Agenda

• The ICT Industry

• Software Industry: Growth and Profile

• R&D Features

• Future
ICT Sector Trends

- ICT sector GDP increased from Euro 15.8 billion in 2000-01 to Euro 45.18 billion in 2007-08 with CAGR of 21.3%.
- Contribution of the ICT sector to GDP increased from 3.4% to 5.9%.
- Share of ICT manufacturing sector to GDP remains more or less constant with about 0.35%.
- Share of ICT services sector to total GDP increased from 3.05% to 5.52% (Euro 14.15 billion to Euro 41.8 billion).
- Annual growth rate of ICT services between 23% and 26%.
- IT services exports increased from Euro 5.93 billion (2003-04) to Euro 20.20 billion (2008-09).
- Contribution of exports in total ICT sector has increased from 64.5% in 2004-05 to 66.1% in 2008-09.
Share of ICT Services to ICT GVA (%)

<table>
<thead>
<tr>
<th>Year</th>
<th>ICT services sector GVA</th>
<th>ICT org. mfg. GVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000/01</td>
<td>89.4</td>
<td>10.6</td>
</tr>
<tr>
<td>2001/02</td>
<td>90.6</td>
<td>9.4</td>
</tr>
<tr>
<td>2002/03</td>
<td>89.4</td>
<td>10.6</td>
</tr>
<tr>
<td>2003/04</td>
<td>90.8</td>
<td>9.2</td>
</tr>
<tr>
<td>2004/05</td>
<td>92.8</td>
<td>7.2</td>
</tr>
<tr>
<td>2005/06</td>
<td>92.1</td>
<td>7.9</td>
</tr>
<tr>
<td>2006/07</td>
<td>94.1</td>
<td>5.9</td>
</tr>
<tr>
<td>2007/08</td>
<td>94.2</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Source: Annual Survey of Industries (ASI) and National Accounts Statistics (NAS), MOSPI, Government of India
Decomposition of the ICT Services sector

![Bar chart showing the decomposition of the ICT Services sector from 2000/01 to 2007/08. The chart indicates the percentage of computer-related services and communication services for each year. The source of the data is National Accounts Statistics (NAS).]
Agenda

- The ICT Industry
- **Software Industry: Growth and Profile**
- R&D Features
- Future
Software Industry

The computer software and services industry was worth Rs. 1337 billion (Euro 24.7 billion) in 2005/06 and it is estimated to increase to Rs. 3483.30 billion (Euro 55 billion ) in 2010/11.

Source: Department of IT, Ministry of Communication and IT
Software Exports

The computer software and services exports were Rs.1041 billion (Euro 19.3 billion) in 2005/06 and it is estimated to increase to Rs. 2696.30 billion (Euro 42.55 billion ) in 2010/11. Exports as a proportion of total output has maintained a share of around 78%. India exports software to 95 countries, USA, UK, France, Germany, Japan, China, South Korea, Taiwan and Hong Kong.
Software Industry by line of service 2010-2011

Total Software and Services exports: Euro 42.55 billion
IT Services: Euro 24.16 billion (56.7%)
BPO: Euro 10.24 billion (24.06%)
Software Products and Engineering Services: Euro 8.15 billion (19%). Bulk of the exports are enterprise applications, followed by technology software
Software Industry by line of service 2010-2011 (Domestic)

Total Software and Services: Euro 11.63 billion
IT Services: Euro 7.4 billion
BPO: Euro 1.9 billion
Software Products and Engineering Services: Euro 2.33 billion
Structure of Indian IT-BPO Industry

- **Large-sized players (7 firms, USD 1 billion)**: 40,000 and above employees
- **Mid-sized players (75-80 firms, USD 1 billion)**: 5000 – 40,000 employees
- **Emerging players (300–350 firms, USD 10-100 million)**: 100 – 5000 employees
- **Small / Start-ups (More than 3500 firms, USD 10 million)**: Less than 73 employees
Top 20 firms in terms of revenue

<table>
<thead>
<tr>
<th>Company</th>
<th>Employees</th>
<th>Revenue (million Rs.) 2007–08</th>
<th>Export</th>
<th>Domestic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tata Consultancy Services (TCS)</td>
<td>126,150</td>
<td>212,150</td>
<td>93</td>
<td>7</td>
</tr>
<tr>
<td>Wipro Technologies</td>
<td>108,071</td>
<td>168,840</td>
<td>76</td>
<td>24</td>
</tr>
<tr>
<td>Infosys Technologies</td>
<td>104,850</td>
<td>155,310</td>
<td>99</td>
<td>1</td>
</tr>
<tr>
<td>HP India</td>
<td>31,656</td>
<td>154,540</td>
<td>18</td>
<td>82</td>
</tr>
<tr>
<td>IBM</td>
<td>76,000</td>
<td>101,010</td>
<td>58</td>
<td>42</td>
</tr>
<tr>
<td>Cognizant Technology Solutions</td>
<td>48,000</td>
<td>63,100</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Ingram Micro</td>
<td>1,200</td>
<td>86,200</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>HCL Technologies</td>
<td>51,979</td>
<td>62,000</td>
<td>93</td>
<td>7</td>
</tr>
<tr>
<td>HCL Infosystems</td>
<td>6,077</td>
<td>50,580</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Redington India</td>
<td>1,700</td>
<td>62,800</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Cisco India</td>
<td>4,850</td>
<td>58,370</td>
<td>92</td>
<td>8</td>
</tr>
<tr>
<td>Oracle India</td>
<td>24,000</td>
<td>58,080</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intel India</td>
<td>2,500</td>
<td>43,100</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>Accenture</td>
<td>40,000</td>
<td>38,000</td>
<td>93</td>
<td>7</td>
</tr>
<tr>
<td>SAP India</td>
<td>5,424</td>
<td>32,600</td>
<td>79</td>
<td>21</td>
</tr>
<tr>
<td>Dell India</td>
<td>13,000</td>
<td>32,000</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Tech Mahindra</td>
<td>24,318</td>
<td>36,370</td>
<td>98</td>
<td>2</td>
</tr>
<tr>
<td>Microsoft India</td>
<td>5,300</td>
<td>32,630</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>Mphasis</td>
<td>33,810</td>
<td>18,810</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Patni Computer Systems</td>
<td>14,479</td>
<td>25,690</td>
<td>99</td>
<td>1</td>
</tr>
</tbody>
</table>
Top 200 firms contribute 86% of the total revenues of the Indian ICT industry.

Multinational firms dominate industry revenues with 12 firms listed among the top 20 firms and around 67% in the top 200 firms.
Evolution: Approximately in four phases

- Till 1984 – state attempted to run the industry discouraged entrepreneurship and foreign investment and was inimical to innovation
- 1984 to 1990 – Potential of software was recognized and the liberalization of the Indian economy
- Computer Policy of November 1984 and the Computer Software Export, Development and Training Policy of December 1986
- Industry was to be independent with the government stepping in to provide only promotional and infrastructure support
- Policy exigencies resulted in “Born Global” firms exports involved little more than bodysnapping, or the practice of providing inexpensive on-site (i.e. at customer locations overseas) labor on an hourly basis, for low-value-added programming services such as coding and testing
Evolution

Post 1990 till 2000

- Formation of NASSCOM in 1988 and subsequent policy measures tried to promote the industry more proactively
- Establishment of the Software Technology Parks (STPs) in 1990 transformed the industry
- Major shift in economic policies devaluation of the rupee by 18% against the US dollar, trade liberalization and duty rationalization, openness to foreign investment and a new industrial policy that removed entry barriers for new firms
- Scenario changed from providing low-end onsite services to high-end offshore services
Evolution

- Influx of multinational corporations (MNCs), including IBM’s return, to establish offshore development centers (ODCs)
- Low probability of success in own brand products, many Indian firms moved into product development in a more measured way, often via the development of products as a service, or the “co-development of products” (i.e. working on behalf of a client)
- Moved up the value chain and the ODC centres as equal partners with the parent organisation
Evolution

- Post 2001 till present: intellectual property (IP) creation and exports alone not enough
- An edge in Semiconductor Design, embedded systems and has the potential of becoming an engineering design house for the world
- Reverse migration of Indian immigrants
- Various government programs promoted the use of IT
- Firms such as Hewlett Packard (HP), Microsoft, Motorola and Siemens established research centers in Bangalore to specifically address the BoP market.
Evolution

- Continue to expand overseas as well as to climb the value chain.
- Phase of learning through outsourcing in India
  - moved from offering outsourced application development
  - to working in other regions
  - moving up in the value chain to producing customized software and “products” for very large customers in industry and government; in cases creating their own product brands
  - co-creators of products
- Acquiring foreign designed products through the takeover of niche firms based in North America and UK
  - to integrate products into their portfolio
  - develop bases for continuing to add value to their overseas operations
Enabling Factors

- Policy Environment
- Strategic Government intervention in skill formation
- Annual output of graduates with a Bachelor’s degree in engineering grew from 247 in 1947 to 237,000 in 2006 (US 2006 was 104,200)
- Proactive role of the Indian middleclass: Human capital investment and risk-taking entrepreneurs
- Firm level business strategies
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R&D Features

- Two sets of players in India who perform R&D activities:
  - large domestic players and subsidiaries of multinationals
  - Large domestic players undertake two kinds of innovative activities: internal and external
  - Two-thirds of the R&D outsourcing work in India are towards MNC captive centres, while one-third is to R&D service providers
  - Small component of a cost arbitrage involved in outsourcing R&D to India, but the real driver is localisation of their products, and developing for emerging markets (Reverse innovation)
66 percent are in the software product development domain, 15% in engineering services and 20% in the embedded systems area. R&D offshoring growth to India is expected to reach $13.1 billion 2011 at a growth of 11.4 per cent from 2010. (Zinnov, 2011)
R&D

- Center-for-globals: labour cost arbitrage model, specifically with respect to high-skilled labour
- Transition from center-for-globals to local-for-globals indicates the growing importance of India as an important location for technological activity
- However, patents are not filed in the name of the India centre
- Indian firms gain access to foreign markets and R&D capabilities by acquiring captive Indian units of foreign firms. Difficult to measure the R&D capacity acquired?
- Cost cutting and market-enhancing exercises?
- Hard evidence in terms of patents or revenue earned through licences is not present
Changing R&D Scenario

- Wipro and HCL, majors in the outsourced product development (OPD) segment have started to move away from merely implementing details of engineering.
- OPD industry in India grew by 30% to reach $8 billion in 2010.
- Clients handing over the entire product lifecycle responsibility to vendors: conceptualizing the product, go-to market strategy, designing the technology architecture and delivering the integrated product.
- Product companies are demanding vertical solutions and they want the partner to front-end collaborate with the ecosystem players in order to resolve bottlenecks in product engineering (extended R&D outfits?).
- Long term partnerships spanning the entire life cycle of products with vendors such as HCL, Wipro, Patni, and also midtier companies such as Mindtree, and Persistent.
Changing R&D Scenario

• No longer …you guys do the engineering, we’ll do the thinking”
• Many companies have announced highly automated, technology enabled, next generation outsourcing models based on pure or hybrid cloud architecture
• Wipro is the world’s largest, independent Research and Development (R&D) services provider
• Estimated Revenue from R&D/PES (2007-08, USD million)
  o Wipro: 760
  o HCL: 438.9
  o TCS: 307
  o Infosys: 267
  o Patni: 111.063
  o Sasken: 142
Positives

- A broad-based network of government-supported research and development laboratories with multi-disciplinary expertise
- Large education capacity with world-class engineering/teaching institutes, a dynamic private sector with a significant number of MNCs and R&D units
- Efforts to nurture technology entrepreneurship by the government (CoEs)
- Increasing foreign investment in R&D
- Domestic players faced global competition from MNCs on their home turf and the need to invest in R&D was tremendous
Constraints

- A number of limitations
  - Lack of dynamism in the government R&D system
  - Poor research output from the higher education system
  - Limited scope and impact of government support programmes for R&D
  - University-Industry alliances weak
  - Absence of an institutional environment to facilitate the sharing and circulation of ideas
  - Poor knowledge diffusion in the local technology systems
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Future

- Greater realization that no longer can Indian companies be the “back-office”

- India needs to become one of the head offices – innovating new products and techniques or shaping major corporate strategies – and a provider of higher value added services in this changing environment, including in growth areas such as cloud computing, security and privacy

- On the other hand India needs more ‘frugal innovation’ that produces more ‘frugal cost’ products and services that are affordable by people at low levels of incomes
Roadblocks to Overcome

- Lack of integrated approach that boosts hardware and software
- Domestic higher education not geared towards R&D
- Hard core product engineers are hard to come by in India, possibly due to a long history in services and a lack of product oriented culture.
- Weak domestic market in comparison to China
Thank you
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