The Indian ICT Industry: Current Trends and Future Challenges

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Acknowledgements – Rajdeep Sahrawat, VP NASSCOM for Data
S Sivakumar, ITC Agribusiness for e-choupal Case

The Indian School of Business

- Research driven, globally focused B-School
- Kellogg, Wharton play an active role
  - All area leaders are from Kellogg and Wharton
- “Innovative” portfolio faculty model
  - Steady state
    • 60-70% coursework taught by resident faculty
  - Currently
    • 30-40% taught by thought leaders from global B-schools
  - Tenure system
    • Managed by an area leader from Kellogg/Wharton
    • Comparable to the top 25 US research B-schools
- Student body
  - Post Graduate Program (420)
  - Executive Education Program (growing rapidly)
What is CITNE?

- ISB’s latest “Centre of Excellence”
  - Wadhwani Centre for Entrepreneurship Development
  - Centre for Analytic Finance
  - Centre for Global Logistics and Manufacturing Strategies
  - Centre for IT and the Networked Economy (CITNE)
- CITNE is an inter-disciplinary research centre
  - Rigorous, relevant and impactful ICT centric research
  - Worldwide Information Systems (IS) research community ↔ burgeoning global-scoped Indian ICT industry
- Mission
  - Foster ICT centric research and education
    a) to propel the Indian ICT industry to the next level globally,
    b) to promote the country’s economic development

Agenda

- India Inc. Background
- An Agrarian to a Service Based Economy
- Growth of IT/ITeS Sector
  - The Global Delivery Model
  - Operational Excellence
- Current Trends and Challenges
  - The Domestic Market
  - CASE - e-Choupal: Towards an Inward Looking IT Revolution
- Educational Reform
  - Talent Gap
  - Research
  - Industry Academia Linkages
- Emerging Opportunities
  - Knowledge Intensive Services
  - R&D
India Inc. - Some Facts

- India’s GDP has grown at nearly twice the global rate over past 20 years
- Steady annual growth in real GDP, industrial production and domestic demand of 5-6%
- Sustained real growth in foreign investment inflows (FDI and FII) since economic liberalization (1991)
- Cumulative forex reserves of ~USD 150bn

Projected High Growth

The top 6 growth centres until 2020... In the emerging markets

1. India 5.5
2. Malaysia 5.4
3. China 5.2
4. Thailand 4.6
5. Turkey 4.1

(CoDP growth 2008-2022)
... and in the OECD countries

1. USA 3.8
2. Japan 3.1
3. Spain 2.8
4. Canada 2.4
5. France 2.3

Source: International Growth Research
A maturing economy led by high growth in services...

- Over the last decade the Indian economy has transitioned from an agrarian economy to a predominantly services based economy.
- Key services sectors - Personal services, trade, hotels, banking, communications and business services.

Progressive liberalization and increasing investor confidence...

<table>
<thead>
<tr>
<th>Sector</th>
<th>FDI / FII Limit*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance</td>
<td>26%</td>
</tr>
<tr>
<td>Civil Aviation</td>
<td>49%</td>
</tr>
<tr>
<td>Private Banking</td>
<td>49%</td>
</tr>
<tr>
<td>NBFCs</td>
<td>49%</td>
</tr>
<tr>
<td>Trading</td>
<td>49%</td>
</tr>
<tr>
<td>Telecom</td>
<td>74%</td>
</tr>
<tr>
<td>IT-ITES</td>
<td>100%</td>
</tr>
<tr>
<td>Power (excl. atomic power)</td>
<td>100%</td>
</tr>
<tr>
<td>Hotel &amp; Tourism</td>
<td>100%</td>
</tr>
<tr>
<td>Drugs and Pharma Mfg.</td>
<td>100%</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Automatic approval
### Heightened Global Commercial Interest

#### Top 5 recipient countries in strongest FDI sectors

<table>
<thead>
<tr>
<th>Business services</th>
<th>Financial services</th>
<th>Motor vehicles (Incl. Accessories)</th>
<th>Electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>USA</td>
<td>China</td>
<td>China</td>
</tr>
<tr>
<td>USA</td>
<td>China</td>
<td>USA</td>
<td>India</td>
</tr>
<tr>
<td>UK</td>
<td>India</td>
<td>Russia Federation</td>
<td>Japan</td>
</tr>
<tr>
<td>China</td>
<td>USA</td>
<td>China</td>
<td>India</td>
</tr>
<tr>
<td>Russia Federation</td>
<td>Russia Federation</td>
<td>Japan</td>
<td>Japan</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ICT</th>
<th>Food and beverages</th>
<th>Pharmaceuticals</th>
<th>Base chemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>USA</td>
<td>USA</td>
<td>China</td>
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<tr>
<td>USA</td>
<td>China</td>
<td>India</td>
<td>USA</td>
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<tr>
<td>China</td>
<td>Russia Federation</td>
<td>China</td>
<td>Japan</td>
</tr>
<tr>
<td>UK</td>
<td>Brazil</td>
<td>Spain</td>
<td>India</td>
</tr>
<tr>
<td>Japan</td>
<td>India</td>
<td>Japan</td>
<td>Germany</td>
</tr>
</tbody>
</table>

Source: IBM-PLI – Global Investment Locations Database, GILD

#### IT - ITeS Sector Evolution
Key Milestones

- Y2K
- Brain drain
  - Labor arbitrage
  - H1B consultant
- Satyam's John Deere Apt. "Offshore"
- Global delivery model
- Quality
  - CMM
  - Operational Excellence
- Captives
  - GECIS → Now Genpact
- Bandwagon effect
- Strategic partnerships
  - INFY now competes with Accenture for full circle client relationships
  - Accenture now poaches INFY engineers in B'lore
- Reverse brain drain

Indian IT - Market Structure

- The industry has a pyramid structure
  - Tier 1 players (i.e. Top 5 firms) account for 44% of total software exports
  - Tier 2 players account for 16% of the industry
  - MNC Captives account for 31% of the industry
  - Focused players account for 4% of the industry and
  - Small players (< Rs 100 crores) account for 6% of the industry

<table>
<thead>
<tr>
<th>Annual turnover</th>
<th>2001-02</th>
<th>2002-03</th>
<th>2003-04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above Rs. 1,000 crore ($210 mn)</td>
<td>5</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Rs. 500 crore-Rs. 1,000 crore</td>
<td>5</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Rs. 250 crore-Rs. 500 crore</td>
<td>16</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>Rs. 100 crore-Rs. 250 crore</td>
<td>26</td>
<td>43</td>
<td>53</td>
</tr>
<tr>
<td>Rs. 50 crore-Rs.100 crore</td>
<td>56</td>
<td>79</td>
<td>96</td>
</tr>
<tr>
<td>Rs.10 crore-Rs. 50 crore</td>
<td>220</td>
<td>244</td>
<td>307</td>
</tr>
<tr>
<td>Below Rs. 10 crore</td>
<td>2,403</td>
<td>2,644</td>
<td>2,853</td>
</tr>
<tr>
<td>Total</td>
<td>7,806</td>
<td>9,019</td>
<td>10,179</td>
</tr>
</tbody>
</table>

Source: Nasscom
Big Three

- In 2005, the big three Indian IT services firms
  - Infosys
  - Tata Consultancy Services (TCS)
  - Wipro
- Surpassed $2 billion in revenue
- Reported an astounding compound annual growth rate of more than 30 percent

Industry Trends

- Approximately 2/3rd of the Fortune 500 companies source IT-ITES services from India
- Offshore outsourcing is being actively embraced by not only large organizations but also middle market companies in the US
- Competition from Multi National IT services providers who are setting up offshore presence aggressively
- The Build-Operate-Transfer(BOT) model appears to be gaining momentum
- Reverse brain drain with ‘000s of Indians returning to India after years of leadership roles in Silicon Valley start-ups and technology MNCs
- India becoming APAC hub for many MNCs (SAP Labs, Nokia, ADI, Cisco); Besides, many Asia-Pacific companies leveraging India better (LG Soft, Samsung R&D, Sony R&D, D-Link, Huawei)
Evolution of ITES in India...

Indian IT-ITES sector grew by 28% in FY06 and currently accounts for 4.6% of the country’s GDP

- Sector revenue exceeded USD 36bn in FY06 - growing at a 25% CAGR over the past decade
- Exports account for nearly two-thirds of the total - growing at a 36% CAGR over the past decade
- Industry employment exceeds 1,293,000 - a net addition of over 1 million employees over the past six years alone

<table>
<thead>
<tr>
<th>Year</th>
<th>USD Billion</th>
<th>Share of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-06E</td>
<td>36.3</td>
<td>4.6%</td>
</tr>
<tr>
<td>2004-05</td>
<td>28.4</td>
<td>4.1%</td>
</tr>
<tr>
<td>2003-04</td>
<td>21.6</td>
<td>3.5%</td>
</tr>
<tr>
<td>2002-03</td>
<td>16.1</td>
<td>3.2%</td>
</tr>
<tr>
<td>2001-02</td>
<td>13.4</td>
<td>2.9%</td>
</tr>
<tr>
<td>2000-01</td>
<td>12.1</td>
<td>2.7%</td>
</tr>
<tr>
<td>1999-00</td>
<td>8.2</td>
<td>1.9%</td>
</tr>
<tr>
<td>1998-99</td>
<td>6.0</td>
<td>1.5%</td>
</tr>
<tr>
<td>1997-98</td>
<td>4.8</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

Source: NASSCOM
IT services exports lead, accounting for 35% of the total, growing at 32-33% (FY06E)

<table>
<thead>
<tr>
<th></th>
<th>FY 2004</th>
<th>FY 2005</th>
<th>FY 2006E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues (USD Billion)</td>
<td>7.3</td>
<td>215</td>
<td>398</td>
</tr>
<tr>
<td>Employees ('000)</td>
<td>13.2</td>
<td>297</td>
<td></td>
</tr>
</tbody>
</table>

Source: NASSCOM

**FY 2005**
- Custom Application Development 49%
- Application Management 27%
- Network Consulting and Integration 2%
- IS Outsourcing 6%
- Support and Training 11%
- Systems Integration 2%
- IT Consulting 3%

ITES-BPO exports* to grow by 37%, estimated to reach USD 6.3bn (FY06E)

<table>
<thead>
<tr>
<th></th>
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<th>FY 2005</th>
<th>FY 2006E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues (USD Billion)</td>
<td>3.1</td>
<td>216</td>
<td>415</td>
</tr>
<tr>
<td>Employees ('000)</td>
<td>4.6</td>
<td>316</td>
<td></td>
</tr>
</tbody>
</table>

* Reclassified to exclude services now included under engineering and R&D

Source: NASSCOM

**FY 2005**
- Customer Interaction Services 46%
- Finance and Accounting 40%
- Human Resource Administration 3%
- Others 11%
Positive outlook for Indian IT-ITES; industry set to achieve targets for 2010

India’s pillars of success

- Access to a large, growing pool of highly qualified talent
- A high degree of quality orientation and demonstrated service delivery expertise
- Keen emphasis on information security reflected in the comprehensive legal framework and elaborate security practices supplemented by enabling intervention
- Improving telecommunication infrastructure
- International standards in real estate and office facilities
- Enabling (and progressively improving) business environment through strong government support; incentives, favorable regulations and policy

...delivered at a sustained and compelling cost-value proposition
Future Growth

Knowledge Work

- R&D work being done out of India
- Over 1700 US patents filed in 2003
  - Texas Instruments (225 patents)
  - Intel (125 patents)
  - Philips (102 patents)
  - Cisco (120 patents)
- Engineering services
- Legal and litigation support
- Financial research (Mumbai)
  - Lehman Bros Research
  - JPM
Growth driven by service line depth,...

- Demand for traditional services remained strong
- Emerging service lines such as infrastructure outsourcing, software testing, etc., in IT outsourcing
- Analytics, research and functional outsourcing (F&A, CIS and HR) in ITES-BPO gained greater visibility
- Engineering and R&D services emerged as an independent segment

...increasing supply-side maturity...

<table>
<thead>
<tr>
<th>Year</th>
<th>Engineering Services &amp; S/w Products</th>
<th>Hardware</th>
<th>IT Enabled Services</th>
<th>IT Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2004</td>
<td>2.9</td>
<td>5.0</td>
<td>10.4</td>
<td>17.5</td>
</tr>
<tr>
<td>FY 2005</td>
<td>3.4</td>
<td>3.9</td>
<td>5.2</td>
<td>6.9</td>
</tr>
<tr>
<td>FY 2006E</td>
<td>3.9</td>
<td>5.9</td>
<td>13.5</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Source: NASSCOM

Note: Services listed are indicative not exhaustive
Significant headroom for growth, less than 10% of the export market captured till date...
Challenges

Industry Risks

- Wage inflation - 10-15%
- Attrition
- Talent gap
- Indian rupee appreciation
- SLA expectations of clients
- Domain expertise
- Ability to move up the value chain
- Tax Holiday – Sunset clause in FY 2009-10
Engineering and R&D, software products hold significant opportunity for India - growing at 43% and 25% (CAGR FY 2003-06E), respectively.

Demographics - Suggest Domestic Market Growth

India the largest contributor to growth in the working population over the next 5 years

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>4,752</td>
<td>5,143</td>
</tr>
<tr>
<td>India</td>
<td>931</td>
<td>1,281</td>
</tr>
<tr>
<td>Africa</td>
<td>303</td>
<td>356</td>
</tr>
<tr>
<td>China</td>
<td>304</td>
<td>444</td>
</tr>
<tr>
<td>South Asia</td>
<td>872</td>
<td>1,012</td>
</tr>
<tr>
<td>Latin America</td>
<td>403</td>
<td>451</td>
</tr>
<tr>
<td>Western Asia</td>
<td>102</td>
<td>107</td>
</tr>
<tr>
<td>USA</td>
<td>203</td>
<td>103</td>
</tr>
<tr>
<td>Europe</td>
<td>497</td>
<td>0</td>
</tr>
<tr>
<td>Japan</td>
<td>58</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: GES, UK, National Survey Research & Migration Survey, National Statistics
Note: This data includes growth in Services
India as a Market

- ICT investments not restricted to services, over USD 5 billion committed towards manufacturing related investments in India by global ICT majors in 2005

- Global auto majors such as Hyundai, Ford, Skoda, Suzuki and Mahindra have made India a manufacturing base for particular models of cars

- Other multinationals such as Toyota, GM and Daimler Chrysler are making India a hub for components

- Engineering services, textiles, tourism, education - some of the newer/emerging sectors where India is expected to play a major role in the coming years

However...

- Low PC penetrations
  - 50-60 million

- Increasing mobile penetration
  - 120M subscribers
  - Adding 6/month

- A lab for m-commerce/3G
  - Spectrum becoming available in 2007
  - ISB-UMN team provided auction design!

- VC/PE activity growing in mobile space

- Yahoo India’s slogan
  - “Internet on your mobile phone”

- Big impact possible at the BOTTOM OF THE PYRAMID
  - ICT changes lives!
CASE
ICT Promoting Development
ITC’s e-Choupal

(With permission from Mr. S Sivakumar,
CEO- ITC Agri Businesses)

Let’s listen to a Farmer

- **Ramdeo Patel**

  Resigned to the fate? Ramdeo is not alone, he actually speaks for 110 million of his fellow farmers.

  - A large majority of them are in the same situation even today

  - Each of whom earn just a fifth of the average income of the rest of Indians
...despite

- Excellent resources:
  - Plenty of arable land
  - Rich & diverse agro-climatic zones
  - Strong research system
  - Large & growing markets

- And legendary resourcefulness:
  - Works very hard (whole family is on the farm)
  - Takes risk (on weather, markets)
  - Is innovative (adapting technology, managing risk)

...because of

- Small size (Average < 1.5 Ha)
  - Resource-poor, weak bargaining power
- Geographical dispersion (> 600,000 habitations)
  - Impacts access to real-time information
- Heterogeneity (agro-ecological conditions, knowledge, investment & risk-taking ability)
  - High need for customisation
- Fragmented agri business industry
  - Poor vertical coordination, not much value addition
- Weak infrastructure (Physical, Social, Institutional)
  - Impacts access to markets, high transaction costs, increases risk (yields, prices)
Demands of the globalising trade

1. Transition from supply-driven to demand-driven value chains
   - Quality as per customer needs (& changing diets)
   - Traceability to farms & farm practices (SPS, TBT)
2. Competitiveness in Price / Value equation
   - Increased farm yields
   - Lower transaction costs along the chain
   - Further accentuating the need for...
     - Customised knowledge
     - Real-time & relevant information
     - Access to quality inputs at competitive prices
     - Effective vertical coordination of the value chain
     - Efficient Price discovery & risk management

Capabilities of IT

- Real-time multicasting
- Seamless workflow
- Storage & retrieval of data
- Broadband connectivity
- Convergence of multimedia

- Unbundling & rebundling the components of a transaction
- Collaboration & vertical coordination
- Virtual aggregation
- Decoupling back-end from front-end
Leveraging IT: ITC eChoupal Illustration-1

- The traditional mandi system for sale Video
  - Pressure to sell due to sunk cost of transportation

- eChoupal Price Discovery Video
- eChoupal Price Discovery Part II Video

* That unbundled the price “information” from sales “transaction”, leveraging the real-time multicasting ability of Internet, and empowered the farmer to decide on when & where to sell
  - And reduced the transaction costs too (by avoiding multiple handling that is necessary in mandi system)

Leveraging IT: ITC eChoupal Illustration-2

- Farm input transaction Video

- Again empowering the farmer, this time by bundling...
  - What to use (knowledge)
  - When to use (information)
  - Supply chain (transaction)

- Through collaborative workflow across entities
- Decoupling ‘source’ of information & knowledge with ‘delivery’
• Web casting of best practices videos, and FAQs
  - access to knowledge with ease
• Interaction across villages through chatting & emails
  - Helps in knowledge sharing among themselves and brings meaning to the 'e' prefix to choupal

• One-to-one interactive ability of Internet, together with relevant testing facilities (soil / water / virus)
  - delivers customized farming solutions
Leveraging IT: ITC eChoupal Illustration

- Broadband connectivity
  - For remote diagnostic of crops
  - And interactive extension

Bottomline

- For the farmer
  - Market aligned production, higher productivity, better farm-gate prices
- For ITC
  - Cost effective procurement of quality farm output & New Business Opportunities
- For other Partners
  - Cost effective reach (of various goods & services) to the huge market in rural India
- Above all, for the nation
  - Global competitiveness, without putting the small farmer at a disadvantage
Concluding Thoughts

Where are we today ........

- Outsourcing - A success
- Ability to scale - Well Demonstrated
- Suite of service offerings - Evolving
- Complexity - Medium - High
- Contract size and life - Small
- Businesses can be monetised - $$$$$

- *Can we bring the benefits to the vast majority of the population?*
- *In chaos lies opportunity !!*