

ICT Services in the Knowledge Economy

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Knowledge Economy

- A knowledge economy: the workforce requires formal, professional or technical education.
- A traditional economy: the workforce learns on the job.
- Of the three occupational categories, agriculture, manufacturing and services, services are unusual in some ways:
 - Those who provide services must be as skilled as the services that they provide. Whereas, in manufacturing, unskilled labor can operate machinery and produce technically advanced products.
 - Services in developed countries are the most knowledge intensive of all sectors, such as in healthcare and IT. Whereas, services in poor countries are the least knowledge intensive, eg., house-cleaning service, catering, convenience stores.



It is possible to be innovative and successful in low-end services.

“One night in a call center.”

- Mary, whose real name is Mariam, was the receptionist for a 6-person lawyer's office in Washington DC.
 - She received and routed all phone calls.
 - She scheduled appointments with the firm's clients.
 - She greeted visitors via a large screen and offered them drinks.
 - She ordered pizza for a staff member for his lunch and later phoned a taxi company to order a cab.

The economics of hiring Mary

- Mary receives a salary of \$300 p.m.
- The telephone, office space and other equipment cost \$2000 p.m.
- Mary can do the work of 8 small-office receptionists.
- Each receptionist in the US costs the company \$3,000 p.m.
- In this example, Mary is a substitute for US labor, i.e., replaces US jobs.

Server maintenance for a bank in NY from Indore, India

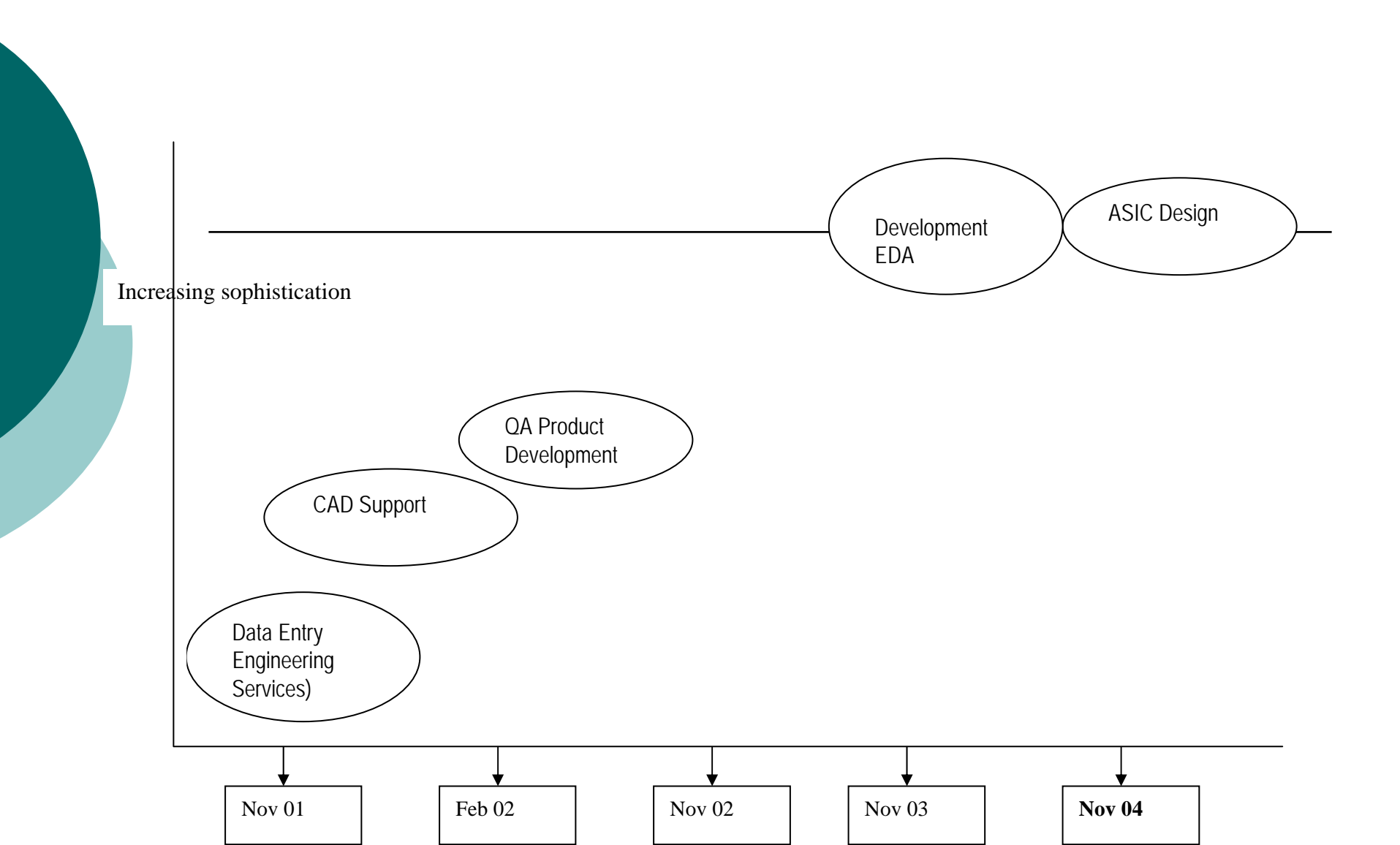


Source of daytime power



... and pollution outside





Source: Agilent Technologies India

India: rising value-addition and role of MNCs

Financial yr ->	2001	2002	2003	2004	2005	2006 (E)
Programming and maintenance (\$B)	4	4.5	5	6	8	10
Total software exports (\$B)	5	6	7	10	13	17
Share of CAD/AM (%)	69	71	69	61	59	60
Share of foreign revenue (%)	14.5	22	26	31	31	NA

Building an outstanding service company

- Question: could the following have been invented in India:?

Google™

Creating Google in India

- Six years till success
 - Needs patient finance.
- Willingness to change.
 - CEO was changed in 2003
 - Changed business models twice
 - First, a tool to analyze searches (Year 1)
 - Second, a search engine (Years 2-5)
 - Third, advertisers pay for clicks (Year 6)
- Indian software industry was created by large firms, not startups.

1980	HQ	2004	Founder, education
TCS	Mumbai	TCS	Kanodia (MIT)
Tata Infotech	Mumbai	Infosys	Murthy (U. Mysore)
Computronics	Mumbai	Wipro	Premji (Stanford)
Shaw Wallace	Kolkata	Satyam	Raju (Loyola)
Hinditron	Mumbai	HCL	Nadar (PSG, Coimbatore)
Indicos Systems	Mumbai	PCS	Patni (U.Roorkee)
ORG	Mumbai	i-Flex	Hukku (BITS)
Systime	Mumbai	Mahindra-BT	Mahindra (Harvard)
90		38	

Google vs TCS

- To capitalize on a good idea requires a large number of good people in a short period of time. Both Google and TCS do it, but ...
- Google has 8000 employees, earns revenues of \$10 bn per year and profits of \$3 bn. Revenue per employee: \$1.25 m; pre-tax profit per employee: \$525,000. Google is 8 years old.
- TCS added 8,000 net new employees in the first six months of 2006; has total annual revenue of \$ 3 bn; revenue per employee: \$50,000; pre-tax profit per employee of \$10,000. TCS is 32 years old.
- The top 8,000 employees at TCS are probably as good as Google's 8,000 in technical capability. In fact, many of Google's employees are Indians trained in India. So, what is the difference due to?

The education gap, according to Silicon Valley recruiters.

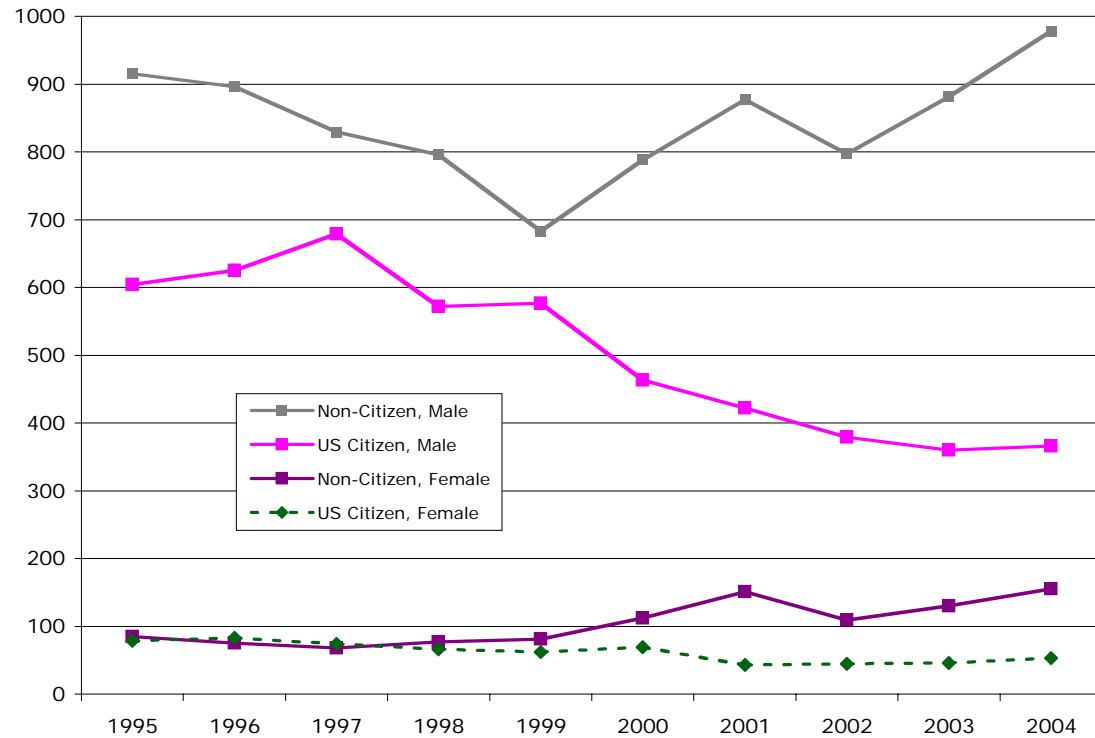
Experience	Catch-up time (years)	Shortfalls
Fresh engineer	1.5	Team-work skills; Technological skills are 'one-generation' behind US
5 years	3.0	Project management skills; product marketing skills; tech skills are 'two- generations' behind US
10 years	'Never'	Hierarchical approach; overcautious risk- management

Indian and Chinese engineers in Silicon Valley

	China	India
High School	< 1	< 1
B.Tech	11	21
M.Tech	52	40
MBA	7	28
Ph.D	29	8
Other	1	3

	China	India
Exec/Mgr	23	68
Technical non-mgr	68	28
Other	9	4
Total	100	100

Need to use diaspora labor pool: number of EE Ph.D.s in US

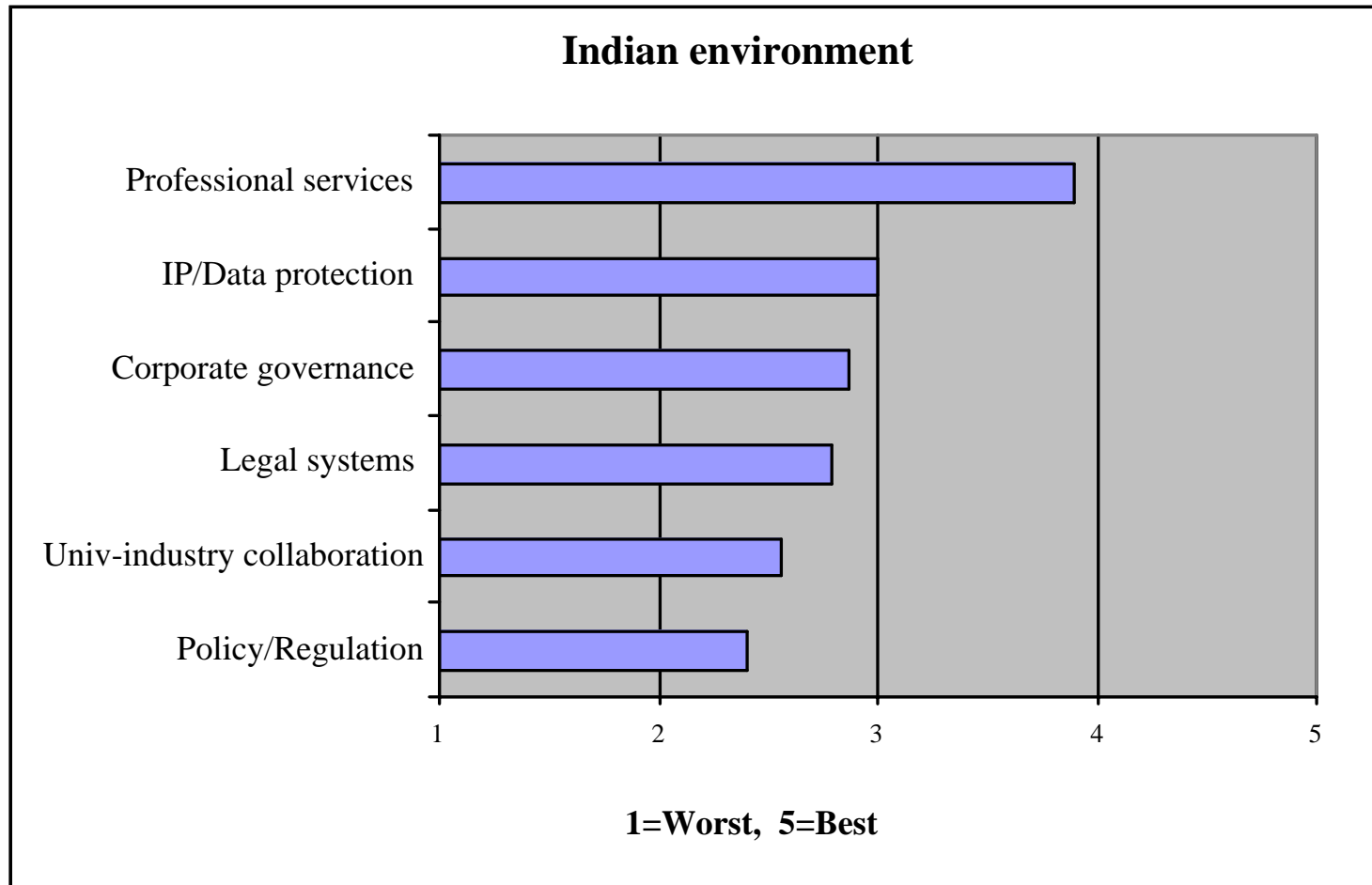


Case study of VC in India (with Asawari Desai, TiE)

- Venture capital rules unfriendly to startups in India

	EU	China	India	Israel	UK	US
% in seed/early stage	29	41	12	50	10	20

Venture environment - 2





Policy: Public-private partnerships

- Public funding for SMEs (small and medium enterprises).
- Type 1: Public funds provided directly to entrepreneurs
- Type 2: Public funds, in partnership with private funds (PPP), invested in independent small ventures.
- Type 2A: PPP funds for global VC collaborations
- Type 2B: PPP funds for domestic funds to leverage institutional finance
- Type 3 (Default type): No PPP. Instead, public policy should support the development of institutional finance through regulation.

Optimal types of government financial support (public funds) and users' responses.

Note: Boxes show capital providers' and users' responses.

	High	Type 2B		Type 3
		<div style="border: 1px solid black; padding: 5px; width: fit-content;"> US: successful SBIC 1960-80. </div>		<div style="border: 1px solid black; padding: 5px; width: fit-content;"> US: reliance on pension funds from 1980 </div>
VC Domain Expertise				
Low		Type 1, Type 2 (A&B)		Type 1, Type 2 (A&B), Type 3
		<div style="border: 1px solid black; padding: 5px; width: fit-content;"> US SBIR/STTR funds; Israel BIRD project 1980; Israel Yozma </div>		<div style="border: 1px solid black; padding: 5px; width: fit-content;"> Recommended for India </div>
	Low		Maturity of Institutional Finance	High

Recommendations on regulation

- Accredite HNW overseas investors and allow tax pass-through
- Remove 25% limit on corpus investible in a single firm by DVCF
- Remove 33% limit on investment in listed securities via primary issue
 - Replace with 33% limit on investment in listed securities via secondary market purchase.
- Remove minimum capitalization requirements on domestic subsidiaries of FVCIs.
- Raise tenure of convertible securities beyond 18 months to negotiated period.
- Enable VC funds to be created as LLPs/LLCs
 - Naresh Chandra Committee has recommended LLPs for professional service firms only.

ICT in rural India

- Study done in 2005 showed low usage of ICT kiosks, most averaging < 25 users/day.
- Sites covered: APOne (75), Bellandur (200), Boodikote (20), e-Chaupal (25), Gyandoot (10), HPiCommunity (13), MSSRF (22), n-Logue (20), Warana (40)
- Services needed did not match services required, which were government services: certificates (affidavits, BPL, land records), transactions (utility and tax payments), services (health, education).