Outsourcing

Bertrand Meyer

ETH, November 2012

Tract handed out at entrance to Siemens main site, Munich, May 2004

Mai 2004

SIEMENS NACHRICHTEN

Für die Beschäftigten des Siemens-Konzerns

Siemens-Globalisierungsstrategie gefährdet Standort Deutschland

Siemens hat ein Programm zum Abbau und zur Verlagerung von Arbeitsplätzen in Niedriglohnländer beschlossen. Betroffen sind alle Unternehmensbereiche im Konzern und alle Tätigkeiten - Entwicklung, Programmierung, Fertigung und Verwaltung. Diese Strategie ist eine existenzielle Bedrohung für die Siemens-Beschäftigten, ihre Familien und für viele Regionen und schwächt den Standort Deutschland. Bei konsequenter Umsetzung der weltweiten „Anpassung" von Umsatz und Wertschöpfung im Konzern stehen in Deutschland langfristig über 70.000 Arbeitsplätze zur Disposition. Nur wenn wir länger arbeiten und auf bis zu 30 Prozent des Einkommens verzichten, will Siemens einen Teil der Jobs halten.

Wir wissen, dass nicht jeder Arbeitsplatz gehalten werden kann und dass die deutsche Gesellschaft von der internationalen Arbeitsteilung profitiert. Aber „gesellschaftliche Verantwortung" (Siemens-Leitbild) heißt auch, für Arbeitsplätze, die wegfallen, neue zu schaffen. Wir sind auch nicht gegen Globalisierung. Aber wir sind gegen Lohndumping und gegen Stellentourismus in Länder, in denen Demokratie, Menschenrechte und soziale Standards wenig gelten. Diese ausschließlich am Profit und an schnellen Ergebnissen orientierte Siemens-Strategie gefährdet den Standort Deutschland, schadet der Bevölkerung in den Zielländern der Jobwanderung und ist zudem unternehmerisch riskant.

Wir fordern deshalb vom Siemens-Zentralvorstand:

- **Eine konzernweite Vereinbarung für die Sicherung der Arbeitsplätze und der Zukunft der Standorte**
- **Keine betriebsbedingten Kündigungen im Zusammenhang mit Verlagerungen**
- **Ausnutzung der Flexibilisierungsmöglichkeiten im Tarif statt längerer Arbeitszeiten, was nur weitere Arbeitsplätze kostet**
- **Hände weg von den Einkommen - statt dessen Optimierung der Prozesse und Nutzung aller sonstigen Einsparmöglichkeiten**
- **Keine Inanspruchnahme öffentlicher Förderung bei Arbeitsplatzverlagerungen**
- **Ein Konzern-Programm für mehr Kundennähe und für mehr Innovationen in Deutschland**

Ich unterstütze diese Forderungen durch meine Unterschrift !

ICSE 2006

Shanghai 2006

28th International Conference on Software Engineering

Shanghai, China 20-28 May, 2006

Dates | Registra

Symposium (NSEFS 06). Topics of interest to the organizers of ICSE 2006 include, but are definitely not restricted to:

- Software requirements engineering
- Software architectures and design
- Software components and reuse
- Software testing and analysis
- Theory and formal methods
- Computer supported cooperative work
- Human-Computer Interaction
- Software processes and workflows
- Software security
- Software safety and reliability
- Reverse engineering and software maintenance
- Grid software
- Software economics
- Empirical software engineering and metrics
- Aspect-orientation and feature interaction
- Distribution and parallelism
- Software tools and development environments
- Software policy and ethics
- Programming languages
- Object-oriented techniques
- AI and Knowledge based software engineering
- Mobile and ubiquitous computing
- Embedded and real-time software
- Internet and information systems development

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novel educational insights.

A profound transformation

Massive transfer of development towards specialized suppliers, largely in low-wage countries.

Outsourcing is not new; offshore development is a major new trend, affecting everyone in the information technology.

Even in the absence of outsourcing in a strict sense, many developments are distributed among two or more sites. This is the second theme of this course.

Outsourcing: a profound transformation

Started with manufacturing

Then electronic design

Then low-level service jobs

Then call centers, customer support…

Then implementation-level programming

Then?

"Three years ago, during my visit to India, the country was emerging as an IT superpower. Today, the country is handling the most sophisticated projects in the world. I am impressed with the talent we have in our India Development Centre and the quality of software being developed."

Bill Gates, ca. 2005


OMAHA WORLD-HERALD
KOTERBAN
NO. YOU MAY NOT OUTSOURCE YOUR HOMEWORK TO INDIA.

As a matter of fact…

http://www.nytimes.com/2005/09/07/technology/07iht-tutors.html

(Indian counselors helping American high-school students with their English classes)

GRAND AVENUE **BY STEVE BREEN**

Our purpose

Understand the outsourcing and offshoring phenomenon from a software engineering perspective

Help you devise the best strategies to cope with it and take advantage of it — for your company and for yourself

It is not just outsourcing

Gone are the days of one-company, one-team, one-location projects

Today's developments are multipolar!

- Distributed team
- Flexible assignment of tasks
- Outsourcing, insourcing, backsourcing
- Flexibility is key: the world belongs to the nimble
- Lots of ideas, proven and unproven, e.g. agile methods
- What happens in the absence of direct contact?
- Universities do not prepare for this!

Four key elements

Strategy

Process

Technology

Communication

IT industry overview

Worldwide IT services revenue (Forrester):

2008: 1.7 trillion

12% increase in 2007, 6% in 2008

(Hardware: 478 billion (2007))

2009: 1.5 trillion (Nasscom), 2.9% decrease

(Hardware: -8%)

Outsourcing "*primary source of growth*"

"*Replaces internal IT spending and is often funded outside of IT budgets, so growth in outsourcing is possible even in the face of flat IT budgets*"

IT outsourcing

Sources: Gartner, XMG

2000: reached over half (54%) of IT services in North America

2002: $162 billion

2007: $236 billion

2009: $374 billion (XMG)
2010: $425 billion, 13.9%
2011: $464 billion, 9.2%

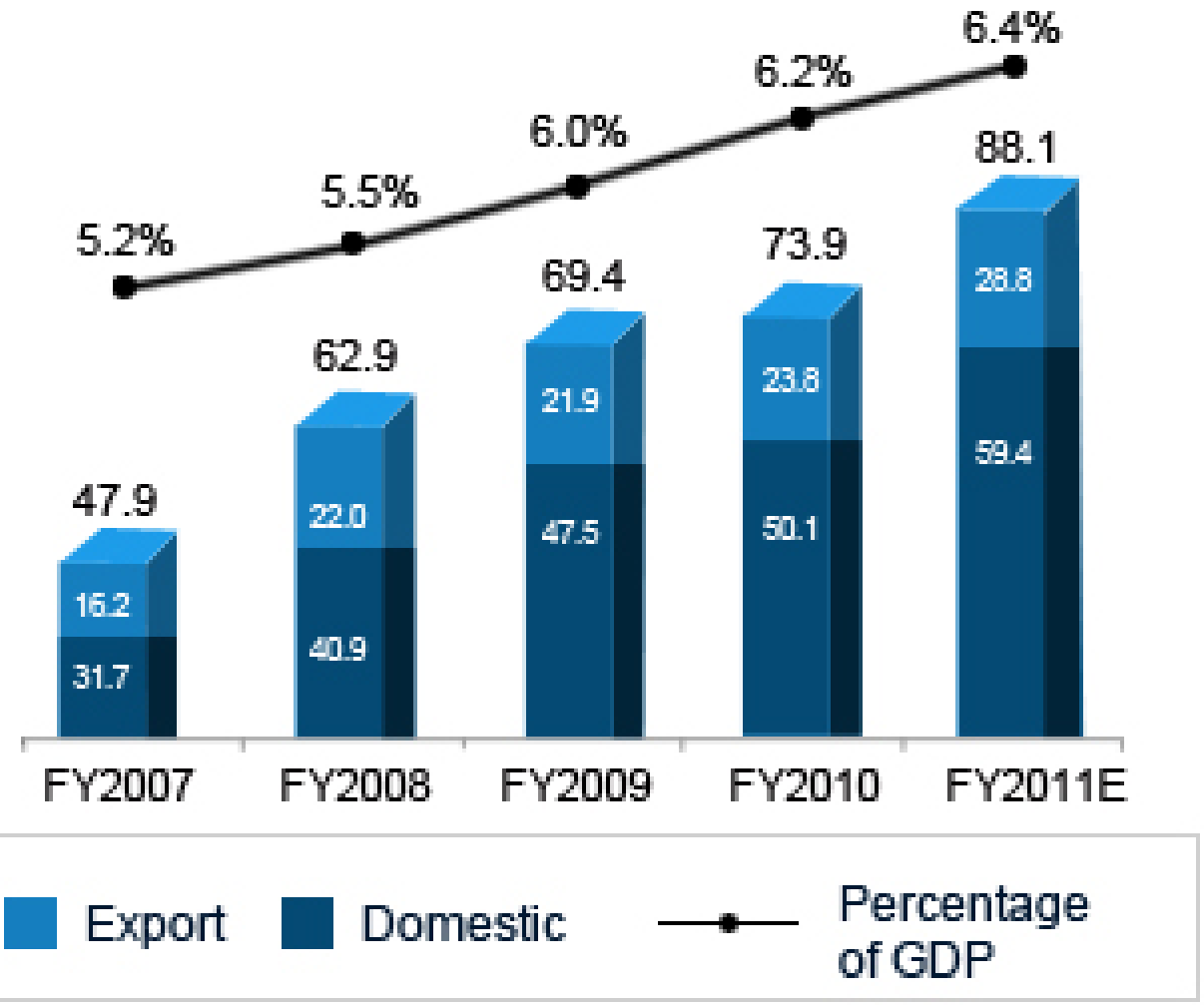
Kotak's valuation summary of key Indian technology companies				
Company	FY11 EPS	FY12 EPS	Growth	FY12 P/E
HCL Tech	22.8	28.3	24%	16
Hexaware	5.1	10.1	98%	11
Infosys	122.4	153.4	25%	22
Mindtree	27.4	39.3	43%	13
Mphasis	51.8	46.4	-10%	14
Patni	40.4	33.7	-17%	14
Polaris	19.4	19.8	2%	9
Satyam	2.7	4.1	52%	15
TCS	43.0	50.0	16%	23
Tech Mahindra	62.0	65.4	5%	10
Wipro	21.1	24.3	15%	20

Source: Kotak Institutional Equities

Continued growth expected for 2012 and later

Indian IT&BPO outsourcing

Source: Nasscom



Source: NASSCOM

Percentage of offshoring

Percentage of offshoring in IT budget (Forrester):

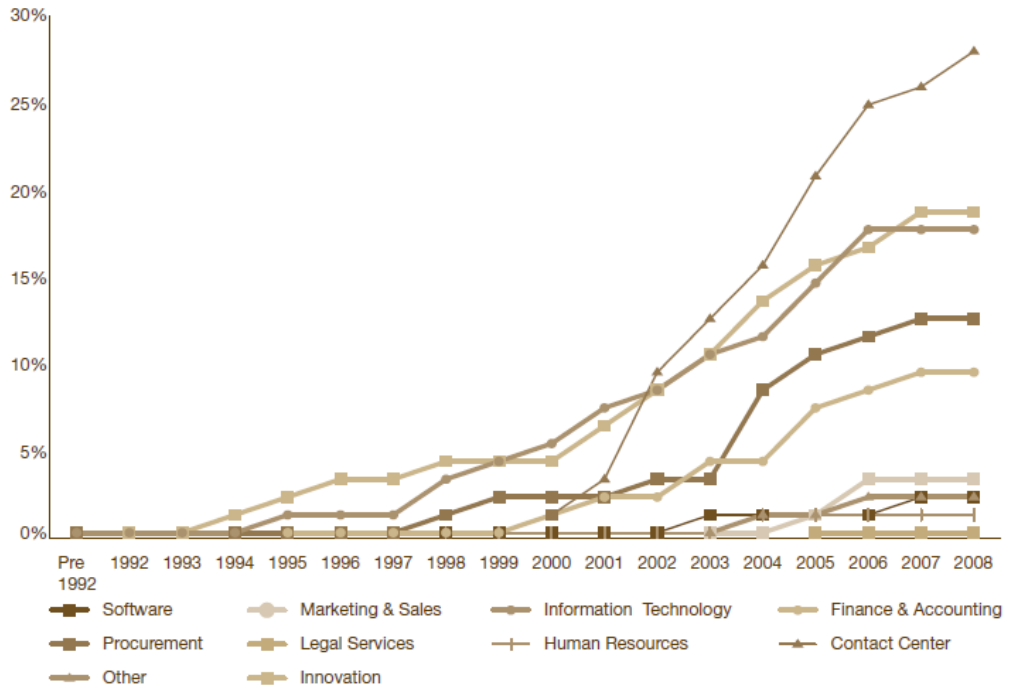
2000: 12%

2003: 28%

(fairly stable since then)

Chart 2: Cumulative percentage of implementations offshored in high-tech and telecom industry by function and year (Percent of total number of implementations over whole period)

Source: Duke University/Archstone Consulting Offshoring Research Network 2005 US survey and Duke University /Booz Allen Hamilton Offshoring Research Network 2006 US survey and Duke University/The Conference Board Offshoring Research Network 2007/8 US survey and Duke University/The Conference Board Offshoring Research Network 2009 survey



When they say it's not about the money…

… then it is about the money

It's about the money

In the better economic times, companies outsourced IT to get access to scarce IT talent. But in today's down economy, saving money has bubbled to the top as one of the primary reasons for making outsourcing deals

Computerworld, March 18, 2002

Right now, in this economy, cost savings is No. 1 criterion

Tim Barry, Senior VP of Application Outsourcing, Keane, 2002

Because of the recent global economic downturn, cost reduction has been the primary driver for outsourcing over the past several years and continues as a strong driver even as economic growth returns

Gartner, 2004

The offshoring proposition

Low salaries
Skilled workforce
Good university system
Good communication infrastructure
Stable political structure
Efficient business conditions
Entrepreneurial culture (greed?)
No insurmountable cultural barrier
Language skills
(Often) exile community in the client country
Culture of quality and qualification (CMM, ISO…)

India

Environment component	3.9	58
Market environment	**4.4**	**41**
1.01 Venture capital availability*	3.2	31
1.02 Financial market sophistication*	5.2	35
1.03 Availability of latest technologies*	5.6	41
1.04 State of cluster development*	4.2	29
1.05 Burden of government regulation*	3.0	94
1.06 Extent & effect of taxation*	4.0	36
1.07 Total tax rate, % profits	63.3	119
1.08 No. days to start a business	29	94
1.09 No. procedures to start a business	12	116
1.10 Freedom of the press*	6.1	25
Political and regulatory environment	**4.3**	**52**
2.01 Effectiveness of law-making bodies*	4.3	36
2.02 Laws relating to ICT*	4.5	39
2.03 Judicial independence*	4.8	40
2.04 Efficiency of legal system in settling disputes*	4.1	46
2.05 Efficiency of legal system in challenging regs*	4.2	37
2.06 Property rights*	4.5	60
2.07 Intellectual property protection*	3.6	65
2.08 Software piracy rate, % software installed	65	58
2.09 No. procedures to enforce a contract	46	121
2.10 No. days to enforce a contract	1420	133
2.11 Internet & telephony competition, 0–6 (best)	6	1
Infrastructure environment	**3.1**	**81**
3.01 Phone lines/100 pop.	3.1	110
3.02 Mobile network coverage, % pop. covered	83.0	104
3.03 Secure Internet servers/million pop.	1.6	104
3.04 Int'l Internet bandwidth, Mb/s per 10,000 pop	2.2	95
3.05 Electricity production, kWh/capita	714.3	104
3.06 Tertiary education enrollment rate, %	13.5	101
3.07 Quality scientific research institutions*	4.7	30
3.08 Availability of scientists & engineers*	5.2	15
3.09 Availability research & training services*	4.4	51
3.10 Accessibility of digital content*	4.5	93

Readiness component	4.8	33
Individual readiness	**5.5**	**21**
4.01 Quality of math & science education*	4.7	38
4.02 Quality of educational system*	4.3	39
4.03 Adult literacy rate, %	62.8	120
4.04 Residential phone installation (PPP $)	17.9	12
4.05 Residential monthly phone subscription (PPP $)	7.2	44
4.06 Fixed phone tariffs (PPP $)	0.06	36
4.07 Mobile cellular tariffs (PPP $)	0.06	4
4.08 Fixed broadband Internet tariffs (PPP $)	14.9	6
4.09 Buyer sophistication*	3.8	43
Business readiness	**4.5**	**33**
5.01 Extent of staff training*	4.1	58
5.02 Quality of management schools*	5.1	23
5.03 Company spending on R&D*	3.6	37
5.04 University-industry collaboration in R&D*	3.7	58
5.05 Business phone installation (PPP $)	17.9	5
5.06 Business monthly phone subscription (PPP $)	7.2	21
5.07 Local supplier quality*	4.6	60
5.08 Computer, communications, & other services imports, % services imports	34.6	55
Government readiness	**4.5**	**47**
6.01 Gov't prioritization of ICT*	5.3	35
6.02 Gov't procurement of advanced tech.*	3.5	75
6.03 Importance of ICT to gov't vision*	4.6	32

Usage component	3.3	67
Individual usage	**2.8**	**98**
7.01 Mobile phone subscriptions/100 pop.	43.8	119
7.02 Cellular subscriptions w/data, % total	n/a	n/a
7.03 Households w/ personal computer, %	4.4	118
7.04 Broadband Internet subscribers/100 pop.	0.6	100
7.05 Internet users/100 pop.	5.1	118
7.06 Internet access in schools*	3.8	70
7.07 Use of virtual social networks*	4.8	89
7.08 Impact of ICT on access to basic services*	4.9	42
Business usage	**3.4**	**45**
8.01 Firm-level technology absorption*	5.3	39
8.02 Capacity for innovation*	3.6	33
8.03 Extent of business Internet use*	5.1	54
8.04 National office patent applications/million pop	5.3	71
8.05 Patent Cooperation Treaty apps/million pop	1.0	66
8.06 High-tech exports, % goods exports	5.9	38
8.07 Impact of ICT on new services and products*	5.1	36
8.08 Impact of ICT on new organizational models*	4.7	34
Government usage	**3.8**	**47**
9.01 Gov't success in ICT promotion	5.2	22
9.02 ICT use & gov't efficiency*	4.7	41
9.03 Government Online Service Index, 0–1 (best)	0.37	53
9.04 E-Participation Index, 0–1 (best)	0.20	56

(World Economic Forum, Global IT report 2010-2011)

The role of qualification

CMM (the Capability Maturity Model) and its derivatives, such as CMMI, as well as other standards such as ISO 900X, have been a key enabler to the takeoff of offshore development

Other relevant aspects

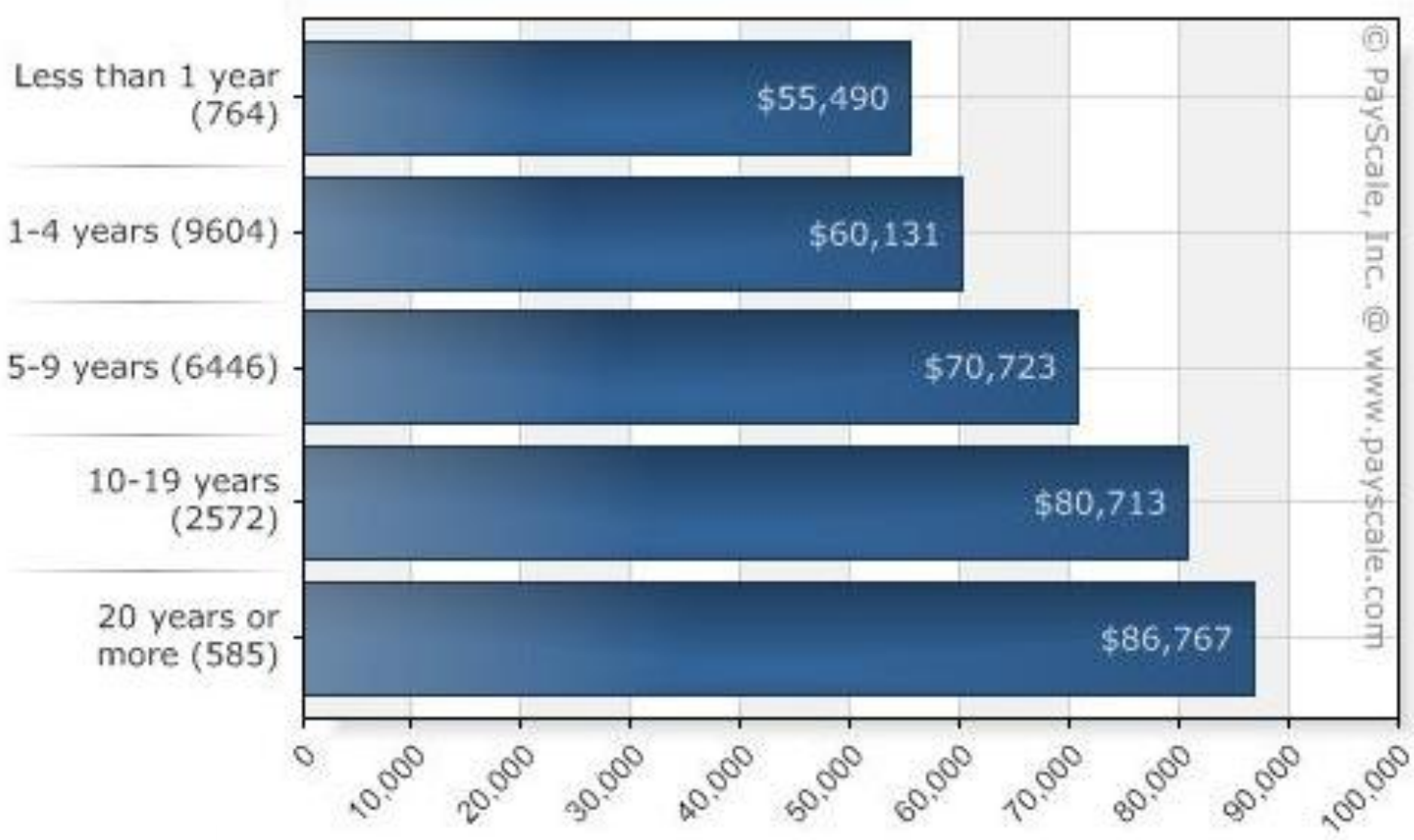
Work ethics

Language skills

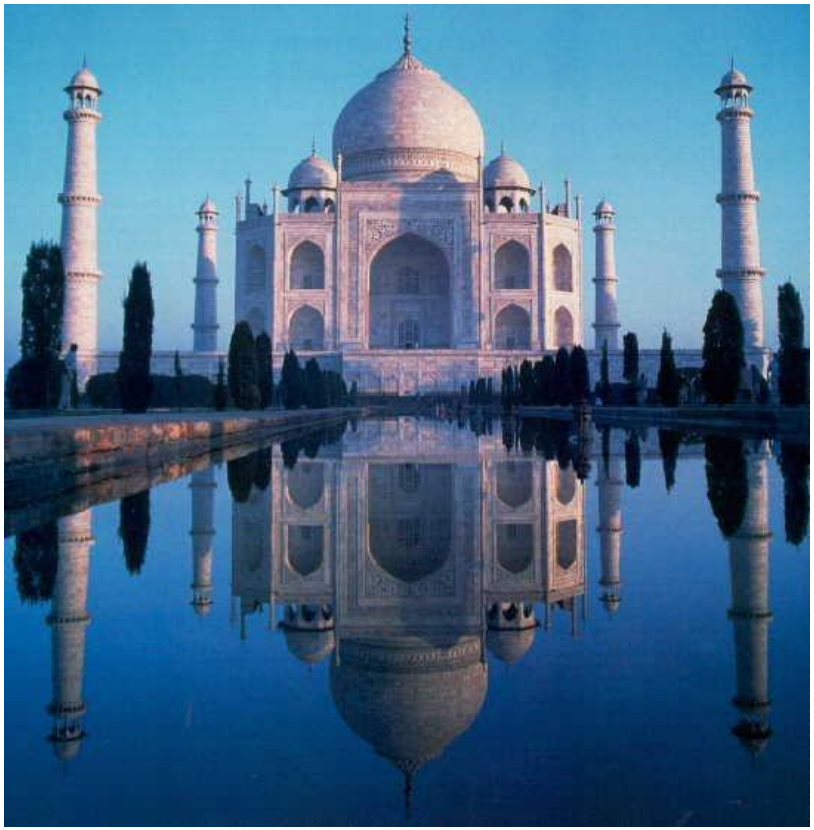
Time zones

For comparison: US developer salaries

Source: Payscale, Sep. 2007



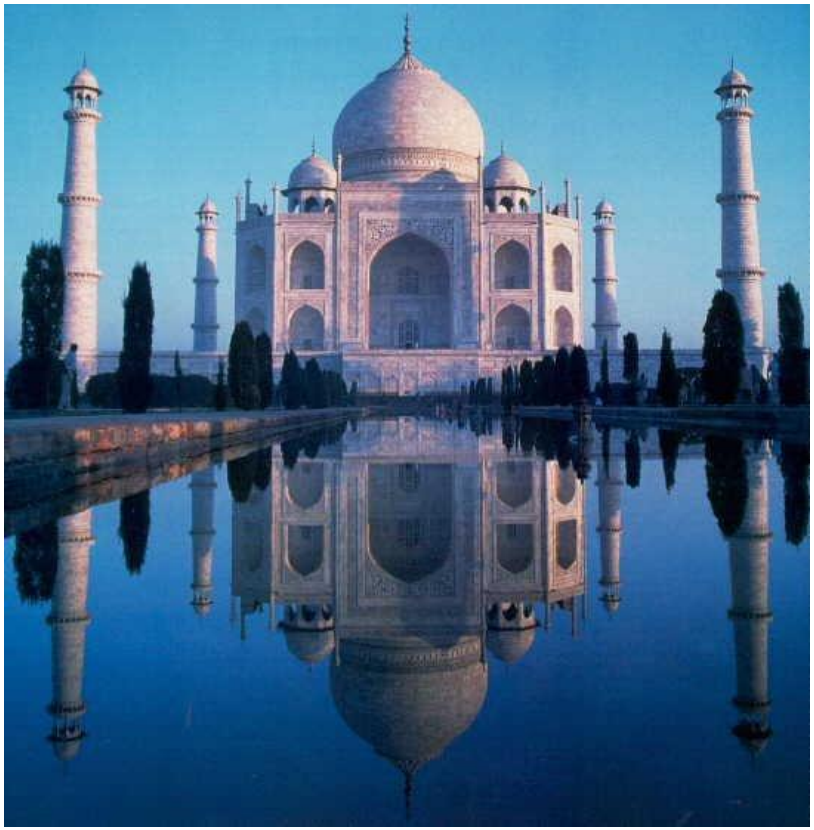
India



Software/services exports: $40 billion in 2008, up 33.7% (2007: $31 billion, 32%). 2009: $50 billion, 2010: $64 billion (73 with BPO), exports $50 billion. 6.1% of GDP, 26% of exports (1998: 4%)

- Official policy to support outsourcing, IT ministry
- University infrastructure, Indian Institutes of Technology; 75,000 IT graduates a year
- English widely known
- Technical salaries: $10,000 to $25,000 (average 15,600 in 2007, up 18.6%)
- IT parks (Bangalore...) have excellent infrastructure
- Key role of Indian technical diaspora in the US
- Strong emphasis on qualification (CMMI, ISO)
- 2.3 million IT professionals (2000: 430,000)
- The reference success story

India



Large software companies: Tata Consulting Services (160,000 employees, $6.4 billion revenue), Infosys (114,000, $4.8 billion), Wipro (108,000, $6 billion), HCL Technologies, Patni

Numerous Western companies have established subsidiaries

Increased competition for talent

China

IT outsourcing revenue: $5 billion in 2005, $10 billion in 2006 (50% growth), $27 billion in 2007 (Gartner)

50,000 technical graduates per year

Technical salaries: $7,000 to $30,000

Intellectual property issues remain

Infrastructure good in major cities

Strengths so far: high tech, consumer electronics, telecom, finance

Russia

IT outsourcing revenue: $1 billion in 2005, growing 50% a year

- Good university system, strong on mathematics and basic science. 3rd largest population of scientists and engineers per capita
- Technical salaries: $15,000 to $35,000
- Business climate volatile, bureaucracy
- Infrastructure: OK in Moscow and Petersburg. Telecoms still expensive. Excellent education system
- Strengths so far: advanced software development, Web development, research
- Significant operations of Western firms: Sun, Intel, Motorola, Alcatel, Siemens

Ireland: "nearshoring"

Technical salaries: $35,000 to $45,000

Favorable tax structure, $330 million technology-education fund

English language

Strengths so far: service centers, call centers (Dell, HP, Microsoft...)

An example of a successful outsourcing infrastructure in a developed country

Software exports (2009): €12 billion (out of which €2 billion local companies)

Challengers

Eastern Europe: Poland, Rumania, Bulgaria, Czech Republic, Hungary, Baltic countries, Ukraine ("nearshore" development)

Vietnam

Thailand

Philippines

15,000 tech graduates/year, labor slightly higher than India, government support

Ghana

Government support, English official language, 10,000 IT grads/yr

Mexico

Close to US, NAFTA

Brazil

Israel

South Africa

Egypt

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Not in Kansas any more (2004)

Source: Rediff

US state adopts anti-BPO bill

The state of Kansas has adopted a bill seeking to bar outsourcing telephone enquiries about its food stamp program to India and other countries.

The Department of Social and Rehabilitation Services signed a contract with eFunds Corp in September 2002 to handle food stamp benefits and take clients' calls. In its 2003 annual report, eFunds said it has two customer call centers in India and that about 3,100 of its 5,400 employees are outside the United States. Outsourcing became an issue in the legislature when it was revealed that Kansas' calls about food stamps were answered by workers not in Kansas but in India.

The measure would require SRS to renegotiate its $1.7 million-a-year contract with the Arizona-based eFunds Corp. The agency said it does not know whether contract costs will increase if calls are answered in Kansas.

In March, Senator Mark Taddiken (Republican) persuaded fellow Senators to add a ban on outsourcing of food stamps work to a bill on next fiscal year's budget. Under his proposal, the ban would have taken effect on July 1. But SRS secretary Janet Schalansky told legislators that the ban would raise the cost of eFunds contract by about $640,000 as a centre will have to be set up in Kansas.

Arguments for outsourcing

Cost

Access to expertise

Focus on core business

Speed

Business process reengineering (aka change)

Control

Quality improvement

Arguments against outsourcing

Loss of control, dependency on supplier

Loss of expertise

Loss of flexibility

Loss of jobs, effect on motivation

Forms of outsourcing

Internal (to lower-cost divisions)		*External*
Same country group		*Offshore*
Specific		*Business process (BPO)*
Operation (e.g. computer facilities)		*Transfer*
Selective		*Total*
Tactical	vs	*Strategic*
Transitional		*Permanent*
Client-supplier		*Partnership (joint venture)*
Maintenance		*New product*
Development/operation		*Research*

Outsourcing risks

Loss of personnel and expertise

Loss of user input and business-related information

Leaks of intellectual property

Failure of third party

Disappearance of third party

Changes in business climate not addressed by contract

Insurmountable cultural differences, language problems

Communication costs, time difference, ...

Insufficiently precise contract

Contract not covering evolution

Rising costs out of modifications

Insufficient quality, detected late

Privacy issues

Security issues

Limits to outsourcing

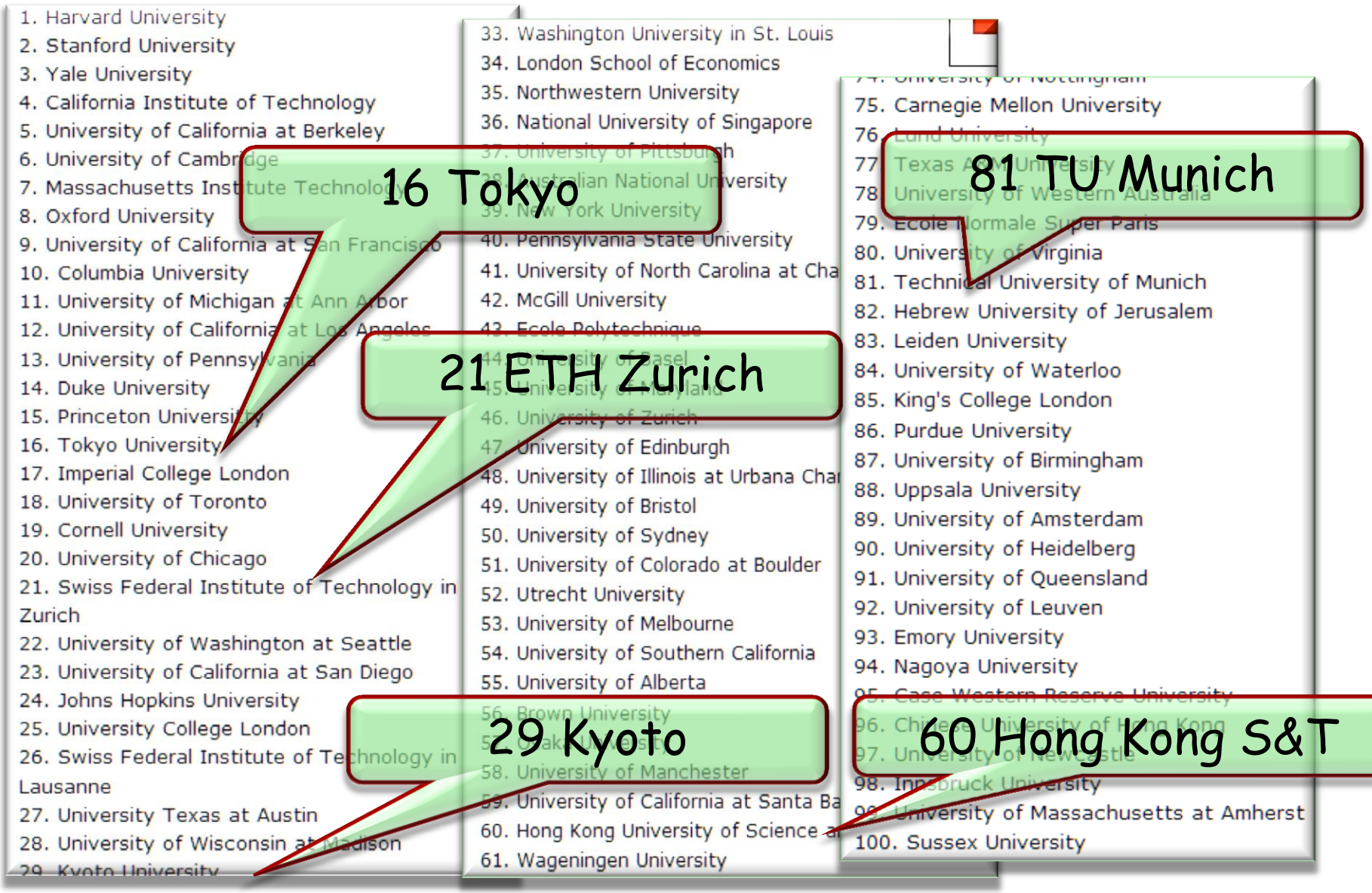
Rising salaries

Labor market overheating

Tasks that can't be outsourced

Insufficient university research

Top 100 universites (Newsweek, 2006)



Other surveys

Webometrics: Tokyo 38, Kyoto 52, Taiwan 63

QS: Tokyo 22, Singapore 30, Kyoto 25, Tsinghua 49, Peking 52, Singapore Nanyang 73

ARWU: Japanese only from Asia in top 100

US News & World Report: Tsinghua 49, Peking 52

Shanghai Jiao Tong: Tokyo 20, Kyoto 30, Nagoya 82, Tokohu 84

Outsourcing and software engineering

Outsourcing is a revelator and magnifier of all software engineering issues, managerial and technical.

Outsourcing is not a substitute for software engineering; in fact, outsourcing requires having a proper software engineering process in place.

Example issues

Requirements
Stakeholder involvement
Specifications (informal, formal)
Configuration management
Quality assurance (construction, verification)
Project management
CMMI (or ISO etc.) qualification
Tools vs personnel
Documentation

What do these ideas become under outsourcing?

- Extreme programming, agile methods, SCRUM
- Use cases
- Lifecycle models
- Modern IDEs
- Open-source