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Company Case Study

Tata Consultancy Services: Selling Certainty

In March 2007, Tata Consultancy Services (TCS) was India's largest IT (information technology) services company in terms of revenue, profits and number of employees, and Asia's largest standalone software company. Part of India's venerable Tata Group, TCS had inaugurated the IT boom that earned India a new respect around the world. In its 2007 fiscal year (ended March 2007), TCS revenues had grown 41% to \$4.3 billion USD with 44% and 22% gross and net income margins respectively.¹ It closed the fiscal year with a \$27.7 billion market capitalization.

After months of preparation, TCS stood poised to launch a marketing campaign unveiling its strategy to differentiate itself from its principal Indian competitors, target the industry's global leaders, and reach \$10 billion in revenues by 2010. TCS intended to differentiate itself based on operational excellence, promising clients that they would "experience certainty." While the strategy built on TCS's existing operational strengths, CEO S. Ramadorai ("Ram") knew that communicating it to the market and translating it into a breakaway trajectory of sustained profitable growth would involve substantial challenges. Competition was intensifying as foreign rivals built large centers in India and local competitors pursued their own aggressive growth targets. Each of TCS's functions would have to be aligned behind the strategy and strengthened for the new competitive environment.

Global IT Services

Global IT Services was a \$628 billion industry in 2005, expected to grow to \$825-875 billion by 2010. Analysts segmented the market into two broad categories: *Product Support* and *Professional Services*. *Product Support* included *Hardware Support and Maintenance* (\$87 billion) and *Software Support* (\$49 billion). These covered installation, technical support, and repairs but excluded development or enhancement of IT hardware and software. *Product Support* services were sold both via long-term support contracts and per-incident fee-based arrangements.²

Professional Services included *Consulting* (\$52 billion), *Development and Integration* (\$193 billion), *IT Management* (\$155 billion), and *Process Management* (\$94 billion). These services formed a rough

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process-chain for how IT was deployed. *Consulting* helped companies align business and IT strategies and adjust operations to take advantage of IT. Consulting recommendations often led to *Development and Integration* projects which involved the development and deployment of customized IT solutions. *IT Management* involved ongoing operation of IT infrastructure, application software, and help desk operations on behalf of clients. *Process Management* went beyond operating IT systems to run IT-enabled business processes for clients, such as transaction processing. This was a component of a broader adjacent market called IT-Enabled Services (ITES) or Business Process Outsourcing (BPO), often abbreviated ITES-BPO.³ The combination of IT Services and ITES-BPO was often abbreviated IT-ITES. (See **Exhibits 1–3** for sales, rankings, and market share.)

Consulting and *Development and Integration* were typically sold on a project basis while *IT Management* and *Process Management* were generally sold via long term outsourcing contracts. Outsourcing contracts often required vendors to hire members of a client's IT staff and purchase its IT equipment. Contracts were typically structured either on a fixed price or a time-and-materials basis. Under fixed price contracts, profitability was often contingent on achieving productivity improvements over the life of the contract and might be deferred until gains were achieved. Recently, new pricing models had also begun to link price more directly to business value delivered.

According to a Gartner survey, median gross margins for IT Services companies by service line in 2004 were 21-30%. Business consulting and IT consulting had the highest gross margins at 38% and 36.3% respectively while data center and staff augmentation had the lowest, 22.9% and 23.3%. Project based contracts had higher margins (33.5%) than ongoing outsourcing contracts (27.8%). Smaller companies (revenues below \$100 million) outperformed with 34.4% average gross margins.⁴

Vendor Selection and Contracting

Clients typically entered into IT outsourcing contracts only after very substantial analysis and deliberation. Since 2001, the industry had seen 250-350 deals each year with contract value over \$50 million and 25 deals over \$1 billion (however average contract values were declining as clients shifted toward multiple smaller and shorter deals).^{5,6} The integration of IT into clients' business processes made outsourcing enormously complex and raised significant execution risks. Given the cost and risk, sales cycles often exceeded one year and contracts were often for up to five years of service or longer. Chief Information Officers (CIOs) typically led the decision-making process for clients but the deliberations often involved the CEO and executives from human resources, legal, and various business units. The largest deals also typically required board of directors approval.

Clients consistently ranked technical expertise as the most important criterion for vendor selection followed by varying combinations of experience, financial stability and price. While buyers did not generally cite vendor brands as an important factor, research indicated that brands did have substantial influence on their ultimate decisions.⁷ Relationships also played an important role in vendor selection. IT Services companies built relationships both with clients at the company level as well as with individuals who could carry their reputation into new companies as they changed employers. Industry analysts such as Gartner, Forrester, and IDC were important influencers, especially through their evaluation of vendor capabilities with respect to specific technologies and project types. Specialized consultants were also involved in assembling multi-vendor contracts that were becoming increasingly common for very large deals.

Systematization and Quality

Historically, IT was viewed more as an art than a science, delivered according to stereotype by eccentric teenagers laboring in solitary garages at night while drinking large quantities of highly caffeinated beverages. Over time, efforts were made to systematize processes for predictable delivery

of quality IT products and services. A major milestone was the development of the Capability Maturity Model (CMM) by the Software Engineering Institute (SEI) at Carnegie Mellon University. The CMM was written under a contract from the U.S. military for use in assessing the ability of defense contractors to complete IT projects. Originally published in 1989 for software development, CMM and its successor CMMI have since been expanded and revised substantially.

CMM appraisals measured the maturity of an IT organization's *processes*. Appraisals ranged from Level One (Initial) to Level Five (Optimizing). To receive a high CMM appraisal, a company had to achieve stringent standards of process discipline and have systems in place to monitor processes and improve them over time. Many organizations reported that process improvement based on the CMM led to improvements in cost, schedule, productivity, quality, and customer satisfaction.⁸ Critics, however, commented that CMM resulted in a bureaucratic focus on filling out forms and that some vendors misrepresented high maturity levels achieved in isolated units or projects as applying to their whole organizations.

In contrast to process assessments such as CMM, there were no broadly accepted measurement standards for output performance in IT Services. Surveys, however, indicated that performance was highly uneven across projects and vendors. According to The Standish Group, only 34% of IT projects in 2004 fully met business expectations on-time and on-budget, half were "challenged"—they were completed and became operational but over budget, late, and with fewer features and functions than initially specified, and 15% were considered to have failed.⁹ According to a Forrester Research survey in 2005, only 37% of users felt their IT shops delivered new or enhanced applications on-time and only 42% felt they were delivered with expected levels of quality.¹⁰ Fewer than 5% of organizations achieved "best in class" 99.9% availability of computer systems.¹¹

Offshoring and Indian IT Services

Offshoring (shifting selected activities to lower cost international locations) first appeared in the custom application development and maintenance (CADM) sub-sector of IT Services in the late 1980s. Offshore software development was spurred by the large differential in skilled labor costs between advanced economies such as the United States and emerging markets such as India. (See **Exhibit 4** for comparative data on labor cost and supply of technical professionals.) Software development was very labor intensive with personnel-related costs accounting for 70-80% of total costs.¹²

NeoIT estimated a typical offshore project delivered savings of 25-30%. Nasscom^a estimated 25-50% savings for IT Services work offshored to India.¹³ Lower labor costs were partially offset by higher communication and management costs, but costs could be reduced further by efficiency gains. (See **Exhibit 5**.) Nearshore^b project savings were estimated at 10-15%. Clients typically achieved smaller savings for the first project sent offshore and better results with more offshoring experience.

In FY 2005, India was the dominant location worldwide for offshore services with an estimated market share of 65% for offshore IT Services and 46% for offshore BPO.¹⁴ By FY 2007, Indian IT Services industry revenues were \$23.5 billion (\$18.0 billion from exports). Total Indian IT-ITES (including hardware) was \$39.6 billion and 5.2% of India's GDP.¹⁵ The largest export market in FY 2006 was the Americas (67%) followed by Europe (25%) and financial services was the largest client

^a Nasscom (National Association of Software and Service Companies) was a highly effective industry association that promoted the interests of the Indian IT and ITES sectors via collaborative problem solving and public policy advocacy.

^b Nearshore locations such as Latin America for the United States and Eastern Europe for Western Europe offered greater geographic and cultural proximity to clients and the convenience of operating in similar time zones while still providing savings versus onshore services.

industry (38%) followed by High-tech/Telecom (19%).¹⁶ (See **Exhibit 6** for growth of Indian IT Services.)

While initially motivated by cost and capacity considerations, quality became a major selling point as the industry matured. (See **Exhibit 7** for Motivators of Offshoring.) In early 2007, 48% of the world's CMM Level 5 software centers were located in India.¹⁷ Successful implementation of offshore delivery required high levels of process discipline, especially in documenting customer requirements. High CMM appraisals were also viewed as important qualifications for marketing offshore services.

Custom Application Development and Maintenance (CADM) accounted for 49% of Indian IT Services exports in FY06¹⁸ and it was estimated that India had reached a 16.4% global market share in application development.¹⁹ However, this service accounted for only 5% of worldwide IT Services spending and Indian IT Services companies were aggressively pursuing growth in new business segments. Majors such as TCS, Infosys, Wipro, and Cognizant were all aggressively pursuing the broader range of IT Services offerings, including IT consulting, systems integration, and outsourced management of IT resources. Many were also pursuing opportunities in ITES-BPO, business consulting, engineering services, and software products. (See **Exhibit 8** for mix of export services.)

Analysts maintained robust growth projections for offshore IT Services. Gartner predicted nearshore and offshore IT Services would grow sixfold from 2004 to 2010.²⁰ Nasscom estimated the total addressable market for offshore IT Services was \$200-250 billion, implying only 10-14% penetration. Similarly, Nasscom estimated a \$120-150 billion addressable market for ITES-BPO, implying 9-12% penetration.²¹ Expectations for continued growth were bolstered by an anticipated shortage of IT professionals in the U.S. There had been a 50% decline in the proportion of college students declaring majors in computer science from 2000 to 2006²² and computer science bachelor's degrees granted fell 28% from 2004 to 2006.²³ Computer science enrollments, however, were highly volatile and had suffered a similar decline between 1983 and 1987.²⁴ Meanwhile, the U.S. Department of Labor projected 25-50% increase in employment in most IT related occupations between 2004 and 2014.²⁵ Proponents of offshoring argued that this implied an environment where the alternative to offshoring would not be higher cost local development, but rather not doing some projects at all.

Critiques of Offshoring

While offshoring had grown rapidly in the late 1990s and early 2000s, many offshoring projects had failed to meet client expectations. A survey by offshoring consultant Ventoro indicated that only half of respondents actually achieved savings via offshoring and that offshoring actually increased costs for 25% of respondents.²⁶ Vendors, however, would often cite insufficient client preparation or poorly defined client processes as the most frequent cause of failure.

Offshoring had also become hotly politicized in the United States and Western Europe. In the U.S., for instance, TV "newshost" Lou Dobbs had run sustained tirades against offshoring to lower-cost countries. And in the UK, the industry's second-most important market, a television station had mounted a sting operation that purported to show that personal information on hundreds of thousands of Britons that had been provided to Indian BPO operations had been sold illegally in India for as little as £8 per person. According to a March 2006 poll by the Pew Research Center, 71% of Americans believed "outsourcing is bad for the American economy because it sends good jobs overseas."²⁷ Economic research studies, however, indicated the benefits of offshoring could exceed the costs to the U.S. A study by the McKinsey Global Institute estimated that for every dollar of business services offshored, the U.S. economy gained \$1.12 to \$1.14 via cost savings, freeing up of workers to perform other jobs, repatriated profits, and exports.²⁸

Indian Competitive Environment

India's IT Services sector was much more concentrated than the global industry. The top 3-4 players (revenues over \$1 billion) earned 45% of revenues, the next 7-10 players (revenues \$100 million to \$1 billion) earned 25%, offshore operations of IT majors earned 10-15% and smaller players (over 3000, revenues <\$100 million) earned the remaining 10-15%.²⁹ The largest firms were also the fastest growing and held a substantial and growing profitability advantage over smaller firms. In 2005, the top 3-4 companies had EBITDA margins of 26-33% and ~40% revenue growth while the next 7-10 had 12-26% EBITDA margins and ~35% revenue growth.³⁰

After TCS, *Infosys Technologies* was the second largest Indian IT company. Infosys earned \$850 million in FY 2007 on revenues of \$3.1 billion and ended the year with 72,241 employees and a market capitalization of \$28.7 billion USD. Infosys was generally recognized as the strongest Indian IT company at branding and marketing. It had the industry's highest offshore billing rates and profit margins. While Infosys pursued a range of growth opportunities, two were particularly noteworthy. It had made the industry's most visible push into business consulting via the launch of a U.S. subsidiary led by the former top-selling partner at Deloitte Consulting. It had also strengthened its position in BPO, buying out its partners to transform its BPO subsidiary Progeon into 100% owned Infosys BPO. Infosys was also noteworthy for its almost complete focus on foreign markets. It was not a significant participant in the Indian domestic market. (See **Appendix 1** for a profile of Infosys)

Wipro Technologies was India's third largest software exporter and a major competitor in the Indian domestic IT Services market. Wipro's Global IT (excluding domestic) sales in FY 2007 were \$2.6 billion. Its Global IT workforce was 67,818 employees (50,354 in IT Services and 17,464 in BPO). Wipro's "string of pearls" strategy called for aggressive growth via acquisition. The company built India's largest outsourced R&D business leveraging internal R&D capabilities from its hardware business and acquisitions of Ericsson India R&D in 2002 and NewLogic in 2005. Wipro's 2002 acquisition of Spectramind gave the company an early position in BPO, where it held the #2 ranking. In IT Services, Wipro had developed a strong position in outsourced infrastructure management, reducing its reliance on application development and maintenance business. In 2007, Wipro added to its infrastructure services portfolio with the \$600 million acquisition of U.S. based Infocrossing.

Cognizant Technology Solutions was based in Teaneck, NJ, but 75% of its employees were located in India making it the fifth largest IT Services company in India. Cognizant's 2006 revenues were \$1.4 billion and the company had 38,800 employees. The company's revenues grew 61% in 2006, far outpacing the average of 40% growth recorded by its peers. Cognizant positioned itself as "easier for Western companies to do business with than other top-tier vendors."³¹ Its business, however, was less diversified than that of its peers, deriving virtually all 2006 revenues from application development and maintenance and 86% from the United States.

Leading foreign IT Services companies were also rapidly building capabilities in India. At the beginning of 2007, *IBM Global Services* was the largest foreign employer in India with 53,000 personnel, up from 9000 only 2.5 years earlier.³² In a speech on June 6, 2006 in Bangalore, IBM CEO Samuel J. Palmisano announced, "We will triple our investment in India from \$2 billion over the last three years to nearly \$6 billion in the next three years....that investment will ensure that we make the most of the opportunities to grow in this marketplace, while it also enables IBM to fulfill its vision to become a globally integrated company."³³ *Electronic Data Systems (EDS)* took a major position in India by acquiring a 52% stake in Mphasis BFL of Bangalore and expected to have 20,000 employees in India by the end of 2006.³⁴ By August 2007, *Accenture* planned to have 35,000 employees in India and was hiring nearly 1800 people per month in the country.^{35,36} (See **Appendix 2** for a profile of IBM Global Services.)

Indian Labor Market Context

Indian IT-ITES employment grew from 284,000 people in FY2000³⁷ to 1.6 million people in FY2007 (690,000 in IT Services Exports, 553,000 in ITES-BPO Exports, and 378,000 in the domestic sector).³⁸ (See **Exhibit 9** for employment trends.) Per a 2005 McKinsey study, projected export growth would increase employment demand by FY 2009-2010 to 850,000 IT professionals and 1.4 million employees in ITES-BPO. The same study estimated that as of 2005, India had the largest pool of talent appropriate for offshore IT-ITES, 1.77 million people or 28% of the worldwide total (followed by China with 11%). It projected that the current growth trend in output of graduates from Indian academic institutions would be able to meet projected demand in IT Services. However, a shortfall of 500,000 employees in ITES was projected by 2010.³⁹

A variety of initiatives were under way to address potential talent shortages. Nasscom and major IT firms collaborated with academia and government to strengthen the pipeline of new graduates. An industry-wide skills assessment and certification program helped companies find appropriate talent. IT companies broadened their hiring to a wider range of backgrounds and added locations in smaller cities, relying on intensive internal training programs to bring new hires up to standard.

Rapid employment growth translated into higher wages. Average pay for Indian IT professionals rose ~15% in 2006.⁴⁰ Wage growth was most pronounced for experienced workers. Nasscom cautioned, however, that rapid wage growth in India did not necessarily imply erosion of India's labor cost advantage. Per Nasscom, "A 15% increase in people related costs for an FTE in India amounts to an increase of \$900-1,100 USD; in comparison a 3% increase in people-related costs for an FTE in the US amounts to an increase of \$1,200-1,400 USD."⁴¹ (See **Exhibits 10** and **11** for wage trends.)

Tighter labor markets also resulted in growing attrition rates. Attrition was also exacerbated by hiring activities of large foreign multinationals which typically had hired experienced professionals instead of building the training capabilities that enabled large Indian firms to hire personnel fresh from university and reportedly paid salaries 20-25% higher than Indian firms.⁴² To control attrition, firms increased wages, offered employees stock or options, invested in training, and increased perks.

TCS History

TCS pioneered India's IT Services sector in 1968 and remained its largest participant in 2007. Founded as a division of Tata Sons, Ltd. to serve its fellow Tata Group companies, TCS soon took on Indian clients outside the Group. Its initial projects involved punch card operations to automate clients' data processing. Director-in-Charge (and later Deputy Chairman) F.C. Kohli soon targeted export markets, winning the company's first foreign client in 1974 and building a joint venture with U.S. computer-maker Burroughs Corporation. Exports enabled the company to learn from overseas markets and earn foreign exchange to import modern equipment. Kohli explained, "We wanted to build technological capability. It was not possible to do that in the domestic market. We had to go abroad, build capability, and transfer it back."⁴³

In 1978, Tata Sons split the Burroughs business off from TCS to create an entity called Tata Burroughs (which later became Tata Unisys and then Tata Infotech) leaving TCS without its export contracts. TCS set about aggressively rebuilding its client base. Selling foreign clients on entrusting their software development to an Indian firm without the Burroughs relationship was difficult. However, Kohli leveraged his personal reputation and relationships as former President of the IEEE (Institute of Electrical and Electronics Engineers) Region 10 (Asia/Pacific) to win contracts for TCS. In 1979, future CEO S. Ramadorai opened TCS's first U.S. office. With an order from IGIC (a data

center for U.S. banks), TCS resumed its growth trajectory and soon added marquee clients such as American Express. In 1984, exports overtook domestic sales, reaching 80% of revenues in 1992-93.⁴⁴

In the mid-1980s, TCS began expanding its export business beyond sending engineers overseas to work under the direction of client management. It started taking on project management responsibility for work executed at client locations, shifting from time-and-materials billing toward fixed price contracts and offering complete IT solutions for its clients.⁴⁵ A major milestone in TCS's evolution was its contract to computerize the Swiss banking clearing house SEGA and its cross-border counterpart Intersecttle (later merged into SIS). Despite bidding a higher price, TCS won the project over the client's regular consultants, Arthur Andersen, based on TCS's superior analysis of the company's requirements. Successful execution established TCS's reputation for quality delivery of large mission-critical projects in the important financial services vertical. TCS's recently developed processes for offshore delivery were also demonstrated and refined on this project.⁴⁶

In the late 1980s, TCS began accelerating its shift to offshore development. By the late 1990s, TCS had 27 development centers in India and derived substantial revenues from offshore work. In the late 1980s and early 1990s, TCS also began investing in the development of software products—both tools for internal use to improve productivity and proprietary products for sale to clients. In the early 2000s, these were supplemented with additional service businesses, as described below.

The Tata Group

Approximately 80% of TCS shares were held by Tata Sons, Ltd., the Tata Group's primary promoter company. The Tata Group's 2005-06 revenues were \$21.9 billion, equivalent to 2.8% of India's GDP. It included 96 operating companies in seven business sectors: information systems and communications, engineering, materials, services, energy, consumer products, and chemicals. The Tata Group also had the highest combined market capitalization among India's business groups.

Since its founding in the 1860s, the Tata Group was known for its dedication to promoting India's economic development and upholding high ethical standards. JRD Tata, Group Chairman from 1938-1991 encapsulated this philosophy in his statement that "No success or achievement in material terms is worthwhile unless it serves the needs or interests of the country and its people and is achieved by fair and honest means." The Tata Group famously refused to pay bribes and lost several business opportunities due to this policy. Current Chairman Ratan Tata oversaw codification of the Group's values in the Tata Code of Conduct, signed by all of the Group's over 200,000 employees.

TCS in 2007

Vision

TCS, as indicated by its name, had long aspired to be a trusted business advisor to its clients. In early 2001, TCS publicly articulated the goal of becoming one of the Top 10 global IT Services companies by 2010. By the end of 2006, it had already achieved this goal along multiple dimensions: it ranked 5th globally in market capitalization, net income and number of employees. On revenues, it ranked 12th but had targeted a goal of \$10 billion by 2010.^c This "10x10" goal was more than a financial milestone. It represented the company's ambition to squarely join the industry's top tier alongside global leaders such as IBM and Accenture. (See **Exhibits 12** and **13** for TCS's financial statements, **Exhibit 14** for a breakdown of its cost structure, **Exhibit 15** for historical trends in its revenues, cost, and profits per employee, and **Exhibit 16** for comparative performance data.)

^c Rankings include only TCS direct IT Services competitors: public sector, telecom, and BPO focused vendors are excluded.

Organization and Management

TCS's organization comprised four types of units: practices (divided further into industry practices and service practices), marketing geographies, delivery centers, and corporate functions. These units were responsible for the key value creation and support processes, articulated in great detail in business process handbooks, that were required to run the business.

Process targets were derived from the overall strategy and an associated balanced scorecard which were developed in the planning process. Individual members of the top management team took responsibility for translating and cascading these measures to their direct reports, who in turn performed the same function for *their* direct reports, and so on, with iteration as necessary. Where processes depended heavily on relationships with other companies, including suppliers and partners, the measures were translated into expectations and requirements from the relevant external entities.

The emphasis on measurement served as the basis for a layered system of reports and reviews that centered on the key operating units and on large accounts. Dashboards that displayed the critical measures, targets, and actual levels during the review period—and that used uniform color coding—were used throughout the organization to facilitate visual management and served as the basis of inter-unit comparisons and internal benchmarking.

This management process was overseen by a top management team that had demonstrated remarkable stability in an industry noted for rapid turnover. TCS's top five executives had all been with the company for over twenty years, and the CEO and CFO almost since its inception. Most of the senior managers had been trained as engineers and all of them had served in operational roles at some point in their careers, factors that CEO S. Ramadorai cited as key enablers of operational excellence.

The pursuit of operational excellence was also eased by the project-focused nature of most employees' work: roughly 80% of TCS's employees were deployed in projects and another 19.5% in project and account management, with business unit and functional management accounting for the remainder. With broadening of TCS's offerings and geographic scope, however, expanding the leadership pool of approximately 500 people was a top corporate priority.

Offerings

TCS intended to achieve the \$10 billion target primarily through nine types of offerings. Core IT Services (76.2% of FY 2007 revenues) had been split into four service practices of which by far the two largest were *technology services* (52.2%), formerly known as application development and maintenance, and *enterprise solutions* (12.2%) involving implementation of large enterprise software solutions such as Enterprise Resource Planning, Supply Chain Management, and Customer Relationship Management; the other two were *testing/assurance* (2.3%) and *business intelligence/knowledge management* (9.5%). In addition, in the early 2000s, TCS began to pursue five "growth engines" each of which the company saw as offering the potential to contribute \$1 billion in revenues in the medium term:

- **IT Infrastructure Services (6.0%):** TCS offered clients end-to-end IT infrastructure outsourcing solutions including: Command Center Services, Managed Security Services, End User Computing Services, Helpdesk Services, Data Center Management, Database Management, and Infrastructure Readiness.
- **Platform-based Business Process Outsourcing (BPO—5.8% of FY 2007 revenues):** TCS's BPO strategy called for the development of differentiated offerings leveraging the company's

technology platforms and experience in selected industry verticals: the company stayed out of the low-end call center business, for example. To speed its growth in BPO outside of India, TCS acquired Comicom, Chile's largest BPO provider, in 2005.

- Engineering and Industrial Services (5.8%): TCS's Engineering and Industrial Services (EIS) offerings were designed to assist clients with product development, production management, and asset management strategies. The EIS practice included over 4000 professionals, most with specific industry expertise. Major client industries included aerospace and automotive.
- Global Consulting (3.4%): TCS's global consulting practice offered IT Operations Consulting, IT Risk Management, Business Services, and IT Strategy Consulting.
- Asset Based Offerings (2.8%): TCS developed enterprise software products to address the needs of selected industry verticals, such as the FNS BANCS, QUARTZ, and NCS solutions for the banking and financial services industries. The company also produced software development tools such as MasterCraft for internal use and external sale.

These offerings combined to give TCS the broadest scope of any Indian IT Services company. And with the addition of the five growth engines, TCS had become a multibusiness company.

Markets and Customers

The same emphasis on breadth was evident in the geographies and the industries ("verticals") that TCS served. Geographically, TCS operated 175 offices in 50 countries. It had been the first Indian IT Services company to engage in large-scale penetration of geographies other than the U.S. by moving into the U.K. and (later) continental Europe, and more recently, had been the first to build up a large Latin American business. In addition, unlike its leading local competitor, it also reported a significant volume of IT Services business in India. Overall, the Americas accounted for 56.2% of TCS's revenues in FY 2007, UK and Europe for 28.5%, India for 9.0% and other geographies for 6.3%.

In terms of verticals, TCS again had a very broad presence but its key revenue generators were banking, financial services and insurance (42.2%), telecom (17.0%), manufacturing (15.3%), retail (7.1%), life sciences and healthcare (4.3%), transportation (3.2%) and energy and utilities (2.4%). There had been substantial effort over time at building up vertical-specific expertise.

Where TCS did focus was on selling to large accounts, especially Fortune Global 1000 corporations, thus a larger share of its revenues was accounted for by its largest client (GE). This focus had recently been reinforced by the institution of internal planning workshops focused on 125 key accounts, an emphasis on cross-selling and on winning larger deals, and the global network delivery model described below. TCS's Latin American delivery centers were a key contributor to the company's selection by ABN-Amro in 2005 for a €200 million worldwide outsourcing contract, the largest IT Services deal won up to that date by an Indian firm. However, TCS's deal sizes were still relatively small and its shares of customers' wallets limited to, at most, a few percentage points. TCS's shares by service, geography and vertical were even smaller, ranging from 0.1% to 1%, except in India, where TCS had ~10% market share. IBM's share of the ABN Amro deal, for example, was nearly 10 times TCS's, but that figure included infrastructure and assets for which TCS did not bid.

Within TCS, even the focus on large enterprises had been challenged: IT spending by small and medium-sized businesses (SMBs) was nearly on par with that of large enterprises and was growing slightly faster. Thus, it had been estimated that the provision of services to Indian SMBs—who were very underserved—might be capable of generating another \$1 billion business by FY 2009.

Sales and Contracting

Sales teams of business development managers (BDMs) responsible for acquiring new clients, business relationship managers (BRMs) responsible for developing business with existing clients, other designations such as regional managers (RMs), regional directors (RDs) and customer relationship directors (CRDs) as well as global relationship managers (GRMs) for large accounts were supported by the marketing team in the relevant geography, which is where overall responsibility for meeting sales targets was vested, and corporate marketing and communications, in engineering value propositions for customers and prospects.

A variety of efforts had been implemented or were underway to improve sales performance: the setting up of a dedicated career path in sales instead of simply rotating personnel who had proved themselves in delivery through it, the launch of a sales transformation program called RevenueStorm, controls such as forced exit from marginal accounts or imposition of minimal rate bands, enablers such as digitization, tools such as profitability calculators and training in contract renegotiation (essential given escalating Indian costs), attempts to induct experienced salespeople from outside the organization, and an ongoing effort to develop global accounts with \$100 million revenue potential.

TCS typically won competitive bids when technical capabilities, process discipline, and price were key criteria. When TCS lost, relationships and brand were often important factors. The old adage that “no one ever gets fired for choosing IBM” continued to hold sway in some companies. Other causes of lost bids included client preference for a local vendor and proposals calling for either more or less offshoring than fit with the client’s comfort level or preference.

Fixed-price contracts—as opposed to time and materials contracts—accounted for 41% of TCS’s revenues, versus significantly lower levels at other Indian competitors (e.g., 27% at Infosys). TCS planned to maintain this ratio, but to improve the profitability of fixed-price projects through better rates (about 5% higher, on average, than for time and materials work) and more offshore leverage. In addition, contracting-related complexities that would further test the salesforce included insourcing requirements, work parceled out among multiple vendors, and other complexities that increasingly characterized large deals, as well as longer term trends toward outcome-based pricing.

An example of insourcing and associated complexities was provided by TCS’s formalization, in October 2005, of a 12-year £486 million (\$850 million) Life and Pensions administration outsourcing deal—India’s largest up to that point, with the Pearl Group of the United Kingdom. The agreement required TCS to establish a U.K. subsidiary regulated by the U.K.’s FSA (Financial Services Authority), which was named Diligenta. Via Diligenta, TCS took on 950 employees from Pearl. TCS retained 75% ownership of Diligenta while a minority stake went to Pearl. Under the agreement, TCS was to pay Pearl £55 million which would be recovered over a four year period. The deal immediately established TCS and Diligenta as the second largest player in the UK market for Life and Pensions administration outsourcing, although profitability would depend on cost reductions through transformation of Pearl’s systems to the TCS platforms, process improvement, selective offshoring, and economies of scale from doing other deals using the same platform.

Another example involving risk- as well as gain-sharing was the five-year, \$250 million (back-ended) outsourcing deal signed with another company from the Tata Group, Tata Teleservices (TTSL). In return for service-level agreements backed by guarantees, TCS would charge TTSL based on a rate per active TTSL subscriber dependent on the growth of TTSL’s subscriber base.

Marketing and Public Relations

Marketing was an area that had not historically been a competitive strength for TCS. Objective indicators varied relative to Infosys: TCS had been estimated to own the more valuable brand, and had logged more mentions in non-Indian media in the last six months of 2006, but Infosys had received more coverage in more prestigious outlets, and probably still had higher recall outside India. Some of the difference could be attributed to the fact that Infosys had been publicly listed for much longer than TCS and so had received more attention from financial analysts and investors. But there also seemed to be a cultural difference between the companies. At TCS, many described a preference to make claims only about what the company had already delivered versus newer (perhaps unproven) capabilities. In the words of a (satisfied) client, Alex Robinson, CIO of Norwich Union (Aviva),

"TCS is more like a 'whale under the water,' not flashy or pushy (in the right sense), but silently moving under the surface with gravity in a sure, collected and confident manner. Many of the competitors are like 'dolphins,' jumping with a lot of flash and dash to show what they have got, but they clearly lack the depth of TCS."

Without trying to mimic its competitors, TCS had moved, in recent years, to market itself a bit more aggressively. Customer meets had been initiated, some advertising had been undertaken, and Chief Marketing Officer Jayant Pendharkar was spearheading a major new advertising campaign as part of a broader rebranding initiative under the tagline "Experience Certainty," as described below.

Human Resources

In FY07, TCS added 32,462 new employees (22,750 net of attrition) to grow the total workforce to 89,419 employees (including employees at subsidiaries). TCS expected that in FY08, it would be the world's largest new employer of technical talent. TCS's FY07 new hires included 5,967 outside of India in locations such as China, Hungary, Poland, and Latin America. According to S. Padmanabhan ("Paddy"), EVP and Head – Global HR, this raised the non-Indian proportion of TCS's workforce from 6.5% to 9.6%. As of Q2 FY07, the average age of TCS staff was 28.2 years old and 75% of the workforce was male. (See **Exhibit 17** for a workforce experience, qualifications, and attrition data.) During the previous fiscal year, TCS received over 625,000 applications, of which 3.5% were selected. More than 85% of applicants who received offers from TCS accepted them.⁴⁷ For the third consecutive year, TCS was rated India's best employer in IT Services by Dataquest-IDC.⁴⁸ However, there were a number of such awards: Infosys, for instance, claimed to have been rated *the* best employer in India in four out of the previous six years.

TCS's extensive training programs enabled it to expand over time the scope of its hiring. Initially, hiring was mainly from the prestigious Indian Institutes of Technology and other premier institutes, and only graduate engineers were recruited. With in-house training, TCS had begun to hire top candidates from a broader variety of backgrounds. New hires began with a four-week induction program that acclimatized them to life at TCS and explained company policies. The program emphasized development of a process and quality mindset. Training in specific technology areas required for a new recruit's initial work assignment followed. These additional programs ranged from 23 to 29 days long. TCS estimated that it spent \$25-30 million on training, excluding the opportunity costs of faculty and attendee time. For comparison, Infosys publicized estimates suggesting it spent about \$150 million, apparently including opportunity costs. What was verifiable were Infosys's very large investments in training infrastructure as well as a training program for new inductees that ran for 16 weeks. Training requirements at TCS were eased somewhat by its reliance on a more experienced pool of hires. Roughly speaking, the hiring mix at TCS was split 60:40 between fresh hires and more experienced people, versus 90:10 at Infosys.

Going forward, TCS's HR practices were being updated to address the need for more specialized roles through creation of separate programming and sales streams, among others, and to cater to and integrate an increasingly diverse workforce across businesses and geographies. Overseas hires were sent to work in India for six months, and programs were organized to provide international rotations for Indian employees. Attempts were made to extend some HR programs globally (such as systems for employee appraisal and competency management) while adapting others to local cultures (such as employee satisfaction measurements and employee communications). Cultural sensitivity and language training were also provided. Ensuring perceived equity in treatment across hires of different nationalities, however, remained complicated.

TCS had a reputation for conservative compensation policies. According to a Deutsche Bank analysis, TCS paid its junior employees on par with its peers but senior employees on average were paid comparatively less.⁴⁹ Despite these policies, TCS's 11.3% attrition rate was the lowest among large Indian IT Services firms. "While our compensation matches industry standards, the fact that we have the lowest attrition, shows that culture in the company makes people stick around" according to CEO S. Ramadorai.⁵⁰ Attempts to advertise this basis of competitive advantage had, however, been muddled by competitive responses that clouded the issue by highlighting other, narrower measures of attrition focused on non-entry level hires. In addition, attrition had inched upward in recent years. To combat attrition, TCS invested heavily in training, increased compensation—including EVA-based incentives, and offered an extensive package of perks and welfare benefits.

Infrastructure

TCS's growth objectives also required massive infrastructure investments. Major new delivery centers were being developed in Chennai, Pune and Noida, among other locations. However, TCS's existing infrastructure remained fragmented, hurting efficiency as well as exacting soft costs in terms of internal communication and customer perceptions.

To support its growing workforce, TCS was also investing in its training infrastructure. According to CFO S. Mahalingam, TCS intended to expand its Corporate Learning Center at Thiruvananthapuram into a global center along the lines of General Electric's famed Crotonville facility.⁵¹ The center resembled a university campus, with hostels for overnight accommodation and recreational facilities, in addition to classrooms and laboratories.

Operations

TCS delivered its services via what the company called the Global Network Delivery Model, which "enables the company to service a customer's requirement through a combination of near-shore, regional, and global delivery centers and provide superior value by effectively addressing regulatory, language, and time zone requirements".⁵² (See **Exhibit 18**) Near-shore centers such as Phoenix and New Jersey in the United States provided customers convenient access to TCS with staff available in the customer's own time zone and familiar with the customer's culture and local business environment. Near-shore centers were typically smaller centers and were used mainly for analyzing client requirements at the beginning of a project and supporting implementation of new systems. Regional centers such as Hungary for Europe and Uruguay for the Americas served both local and global customers. They offered in-demand capabilities and language and cultural sensitivity. Global delivery centers (India and over time China) provided highly efficient offshore service to clients requiring either large scale or deep technical expertise not available elsewhere.⁵³

As of late 2006, TCS had operations in 35 countries across six continents with delivery centers in the United States, Canada, Brazil, Uruguay, South Africa, United Kingdom, Hungary, India, China, and Japan. Geographic breadth improved TCS's ability to serve global clients. As N. Chandrasekaran

(Chandra), TCS's Global Head of Operations and chief architect of the global network delivery model put it, "We are the only company to have a clearly articulated Global Network Delivery Model consisting of GDCs, Regional Delivery Centers, and Nearshore Delivery Centers. It assures the customers one global service standard." Others agreed. Journalist Thomas Friedman had devoted two columns in The New York Times to TCS's operations in Latin America:

A tiny country of three million people, wedged between Brazil and Argentina, Uruguay has come from nowhere to partner with India's biggest technology company, Tata Consultancy Services, to create in just four years one of the largest outsourcing operations in Latin America...Four years later, TCS Iberoamerica can't hire workers fast enough. When I visited its head office, people were working on computers in hallways and stairwells....It turns out that many multinationals like the idea of spreading out their risks and not having all their outsourcing done from India...The firm runs on strict Tata principles, as if it were in Mumbai, so to see Uruguayans pretending to be Indians serving Americans is quite a scene...in today's world having an Indian company led by a Hungarian-Uruguayan [Gabriel Rozman, Head of TCS's Latin American operations] servicing American banks with Montevidean engineers managed by Indian technologists who have learned to eat Uruguayan veggie is just the new normal.⁵⁴

Clients were also proving receptive, as exemplified by the ABN Amro deal cited above. And analysts rated TCS's multilocation capabilities as superior to its Indian and Western competitors. But Chandra sounded a cautionary note: "It is imperative that delivery maturity of Global Delivery Centers match those of the India-based centers."

While TCS pioneered the offshore delivery of IT Services, it had been less aggressive in shifting work offshore than its competitors. In FY07, TCS generated 41% of its revenues from offshore delivery versus 50% for Infosys. Because offshore work was priced lower than onshore, shifting work offshore reduced revenues. However, due to savings achieved by eliminating travel, overseas living expenses, and visa costs, offshore work generated significantly higher margins. Per CSFB analysis, every 1% shift from onsite to offshore could improve margins 20-40 basis points.⁵⁵

Across its global network, TCS pursued continuous improvement in productivity and quality. While some of the outcomes to date are discussed below, in the context of "Experience Certainty," Chandra described some of the drivers of operational performance at TCS:

- Software Reuse: Reuse of intensively tested software components reduced development costs 3-10 fold while simultaneously reducing defects. TCS managed the life-cycle of its software component assets via its "MIGHTY" Reusable Asset Management Platform.
- Defect Prediction Model: Early identification and correction of defects was another well-known driver of cost and quality in the software industry. A bug fix that could be accomplished in only 1 to 1.5 hours if identified in routine code reviews would take 5 to 17 hours to fix in released code.⁵⁶
- Center of Excellence – Technology Maturity Model (CoE-TMM): Focused centers of excellence were designed to ensure TCS remained up-to-date on evolving technologies and best practices and could readily deploy them for clients. The Technology Maturity Model ensured TCS's capabilities kept pace with the technology evolution.
- Process Maturity: TCS's proprietary iQMS framework combined elements of ISO 9001:2000, CMMISM, PCMM®, Six Sigma and SW CMM®. TCS was "the world's first organization to achieve an Enterprise-wide Maturity Level 5 on both CMMI and P-CMM using the most rigorous assessment methodology."⁵⁷

These models were embedded in a culture that stressed compliance with processes and measurement. And work on other operational improvements continued. KnowMax was the latest of a series of knowledge management systems at TCS, and focused on standardizing, simplifying and integrating information, including tacit knowledge, to enhance people-to-people collaboration. The system stored information in terms of 60 asset types, with content being subject to stringent reviews. CEO Ramadorai also cited Tata Group values, encapsulated in the phrase “Leadership with Trust” as a driver of operational excellence. TCS had to achieve a high degree of operational rigor in order to consistently meet its commitments, i.e. to merit the trust of its clients and business partners.

Innovation

TCS pursued innovation in three primary areas: its business model, services it offered to clients, and its delivery methods. Across these areas, the company employed a structured approach allocating 60% of effort to derivative innovation (continuous improvement, 12 months horizon), 30% to platform innovation (next generation platforms, 1–2 years horizon), and 10% to breakthrough innovation (disruption, 2+ years horizon). (See **Exhibit 19** for R&D Priorities as of early 2007.)

According to *BusinessWorld*, TCS ranked 38th among Indian corporates with total R&D spending of Rs. 320 million in 2005-6 (~\$7 million, 0.28% of sales). The same source ranked Infosys 14th, with R&D spending of Rs 1,020 (~\$23 million (1.1% of sales)).⁵⁸ However, TCS countered that if it used the broader definition of R&D favored by Infosys, it would probably report 1.5-1.6% of sales. Foreign competitors’ R&D spending dwarfed that of all the Indian majors combined. Accenture’s 2006 R&D spending was ~\$300 million, and IBM’s exceeded \$2.6 billion (though much of IBM’s R&D was devoted to its hardware business and hence not directly comparable for TCS).⁵⁹

Internal innovation efforts were complemented by the “TCS Co-Innovation Network” including start-ups, alliance partners, and academic institutions.⁶⁰ There was general agreement within TCS that linkages between R&D and the rest of the business should be strengthened. K. Ananth Krishnan had recently been appointed Chief Technology Officer with a mandate to make that happen.

Finance and Inorganic Growth

Capital was not particularly scarce in the Indian software business per se: TCS’s capital employed accounted for about 25% of sales and, as a result, ROCE could in good years exceed 100%. But accessing external sources of capital helped increase the funds available to Tata Sons, as well as increasing analyst and media interest. As a result, TCS went public in India in August 2004. At \$1.2 billion USD for a 13% stake in the company, the IPO was India’s largest to date and first IPO of over \$1 billion USD. CFO S. Mahalingam (“Maha”), who had overseen the IPO, noted with some satisfaction that the IPO was oversubscribed more than sevenfold. After initially listing at Rs. 850 the price rose to around Rs. 1400 in the first six months of trading. By the beginning of 2007, other sales by Tata Sons had reduced the Tata Group’s interest in TCS to approximately 80%.

There was broad speculation that TCS would eventually add an overseas listing, most likely in the United States. Investment bankers suggested that a U.S. listing could increase the value of TCS’s shares traded in India by 10%. ADRs for Indian companies often traded at a premium overseas. For example, Infosys traded 10-20% higher on the NASDAQ versus on the BSE (Bombay Stock Exchange) in 2006.⁶¹

Internally generated funds had so far proved sufficient to fund the acquisitions that TCS had undertaken. (See **Exhibit 20** for a partial deal map covering recent acquisitions and joint ventures.) In addition, on July 15, 2005, TCS announced a merger with Tata Infotech (the former Tata Burroughs business split off in 1978).⁶² This rationalized the Tata Group’s IT Services holdings and bolstered the

company's position in the Indian domestic market, especially in the telecommunications and defense sectors. Looking to the future, the ability to sustain margins was an important factor in TCS's analysis of potential acquisitions, as well as the appropriate balance of acquisitions complementing existing businesses versus ones that were supplementary in the sense of adding similar businesses.

The "Experience Certainty" Strategy

During the summer of 2006, the TCS executive team considered how to differentiate the company from its Indian competitors and compete more aggressively with global leaders such as IBM and Accenture. Reviewing TCS's competitive strengths and weaknesses, the team's attention was drawn to a recently completed study of the company's operational performance.

Between April 2005 and March 2006, TCS had collected extensive data on 2543 IT Services projects (1303 maintenance and support projects, 1240 development and implementation projects). The data yielded elaborate metrics. (See **Exhibit 21** for a sample.) They revealed advantages along several dimensions, of which five will be described here. First, 96.6% of TCS's deliverables were completed on-time according to its own data, and 87% of its customers felt that it met its schedules. Second, 98.8% of deliverables were delivered by TCS without Severity 1 or 2 defects and 89% of its customers felt that delivery met their quality expectations. Third, TCS's defect rate was only 1.4 defects per 1000 function points, versus an industry benchmark of 4.1. Fourth, fixed price projects were delivered with 3.3% budget variation, versus an industry benchmark of 11%. Finally, the cost of quality was estimated to be 16% for TCS's maintenance projects and 25% for its development projects, versus a general cost of quality estimated to vary from 62% at CMM level 1 to 22% at level 5.⁶³ (See **Exhibit 22** for some elaboration.)

TCS executives believed these data proved what they had long hoped and suspected, that TCS led the industry in its ability to predictably deliver high quality IT Services. Prior to releasing the findings, TCS sought external validation of its metrics and measurement systems. The company commissioned a study by Ron Radice, a former director of Carnegie Mellon's Software Engineering Institute (SEI) and author of three books on software development and software quality metrics. Radice's report described the TCS metrics system as "the best I've seen" and that it could itself "be positioned as a model" for the industry.⁶⁴

A parallel effort was undertaken with a Madison Avenue marketing consultant to gain deeper insight into what clients were looking for from IT Services vendors and how they perceived TCS versus its competitors. The study revealed that clients were yearning for truly predictable delivery of IT Services, more so even than for technology innovation.

Based upon these findings, TCS decided to launch the largest global marketing campaign in the history of the Indian IT Services industry, with the tagline "Experience Certainty." (See **Exhibit 23** for the launch advertisement.) The company also simplified its service offerings into three categories: IT Services, Business Solutions, and Outsourcing. The TCS executive team stressed, however, that "Experience Certainty" would be more than just an external marketing slogan. A substantial budget had been allocated for internal training to ensure the workforce, especially front line sales and delivery personnel, would reinforce the concept of certainty in regular interactions with clients. Furthermore, efforts across TCS's functions were underway to raise the bar on the certainty of interactions within TCS, highlighting commitments ranging from day-to-day collaboration on project teams to divisional financial targets. Reinforcing internal and external commitments would shield TCS from any complacency that could creep into the company as it sought to extend its history of success all the way to the industry's global top tier.

Appendix 1: Infosys Profile

Bangalore-based Infosys Technologies was India's second largest IT Services firm. The company posted an operating profit of \$852 million on revenues of \$3.1 billion in FY07 with revenue growth of 44% and operating profit growth of 42%. Infosys employed 72,241 people in 39 offices worldwide and had a market capitalization of \$28.7 billion USD. In Q4 FY07, Infosys drew 49.7% of its revenues from application development and maintenance, 18.4% from package implementation, 7.3% from testing, and 5.2% from business process management. The company's consulting business was growing rapidly, accounting for 4.3% of revenues in Q4 FY07 versus 3.0% during Q4 FY06.⁶⁵

Infosys was generally recognized as strongest among its peers at branding and marketing. Infosys spent 6.7 percent of its revenues in FY07 on sales and marketing, versus the technology industry average of only 1–2%.⁶⁶ The Infosys brand was valued at Rs. 22,915 crore (approximately \$5.2 billion) at the end of FY06.⁶⁷ HR and training programs were also viewed as among Infosys's key strengths.

Infosys consistently delivered strong financial performance with industry-leading offshore billing rates and high profit margins. One of the factors enabling its strong profit margins was the high proportion of revenues derived from offshore work (i.e. work performed in India). Infosys derived 50.2% of its revenues from offshore services in Q4 FY07. Infosys was aggressively acquiring property in India to facilitate its continued growth. Some analysts, however, raised the possibility that Infosys might be sacrificing revenue growth to protect its profit margins. Infosys had also been criticized for the firm's limited use of M&A and very small presence in the Indian domestic market.

Infosys was making the industry's most visible push into business consulting. It hired Stephen Pratt in 2004, formerly the top-selling partner at Deloitte Consulting, to serve as CEO of its new subsidiary, Infosys Consulting Inc. The unit was based in the United States and focused primarily on U.S. clients. As of FY07, the new unit was not yet profitable but expected to reach profitability soon and was viewed as a powerful source of downstream IT revenues.

To strengthen its position in BPO, Infosys bought out the portion it did not own of its BPO subsidiary, Progeon, and renamed it Infosys BPO. While Infosys was a smaller player in BPO than Wipro, it had a relatively rich service mix. Low-margin voice services (call center operations) made up less than 30% of Infosys's BPO work compared to the industry average of over 60%.⁶⁸

In March 2007, S. Kris Gopalakrishnan took over as CEO from Nandan Nilekani, who continued as co-chairman. Mr. Gopalakrishnan announced four priorities for the company: (a) improve competitiveness in operational excellence, (b) improve customer experience with large transformational deals, (c) increase employee engagement especially outside of India, and (d) deepen services by building competencies and broaden service portfolio through innovation and incubation.

Infosys was set up by a group of software professionals headed by N. R. Narayana Murthy in 1981 with an initial capitalization of only \$1000 USD. Infosys had long been a leader among Indian companies in terms of transparency and disclosure. It was the first Indian company to adopt U.S. GAAP accounting (1995) and first to list on an overseas exchange (NASDAQ, 1999) – making more than 100 Infosys employees dollar millionaires (at least temporarily).

Appendix 2: IBM Global Services Profile

Armonk, NY based IBM Global Services, a division of International Business Machines Corporation, was the world's largest IT Services firm with 207,000 people,⁶⁹ \$48.2 billion USD revenues in 2006, and 27.5% gross margin. IBM Global Services revenues were broken down into Global Technology Services, further divided into Strategic Outsourcing (35%), Integrated Technology Services (15%), Business Transformation Outsourcing (4%), and Maintenance (12%); and Global Business Services (33%), including consulting. Revenue growth in 2006 was 1.9%. Global Services contributed 53% of IBM's revenues and 37% of its pre-tax income. IBM's global R&D expenditure was \$6.1 billion,^d 6.7% of revenues.⁷⁰ IBM's strategy called for the company to offer the industry's most comprehensive innovation-driven portfolio of services to design, build, deploy, and manage IT.

According to Interbrand, IBM was the third most valuable brand in the world (\$56.2 billion in 2006), trailing only Coca-Cola and Microsoft.⁷¹ The old adage among IT managers was that "nobody ever got fired for choosing IBM." IBM had deep industry expertise across a broad range of sectors and used that knowledge to sell the business value of its technology services to senior executives. IBM had a strong record of using consulting to sell follow-on technology implementation services. Critics, however, complained that IBM was expensive, inflexible, and locked customers in to IBM-proprietary technologies. While IBM was present in 170 countries, many smaller branches were operated by local partners hampering IBM's ability to deliver consistent services on a global basis.

IBM was under pressure from Wall Street to improve margins and accelerate growth. The company identified four "growth engines": (a) business performance transformation (consulting-type services drawing on capabilities from across IBM), (b) emerging geographies such as Brazil, Russia, India, and China, (c) new markets (retail on demand, sensors & actuators, and information-based medicine), and (d) acquisitions. Results from the first three quarters of 2007 indicated IBM's Services business was making progress toward accelerating growth and improving margins. Revenues were up slightly more than 10% and growth had accelerated in the third quarter. Gross margins rose from 29.7% to 29.9% in Global Technology Services and from 22.6% to 23.7% in Global Business Services.⁷²

IBM was rapidly expanding in India, having grown its workforce there from 9000 people in 2004 to 53,000 in 2007. In 2006, IBM announced plans to invest \$6 billion in India to pay for "increased resources including hiring and training, infrastructure costs (facilities, real estate, taxes), capital expenditures to support IBM and client requirements, and expansion of our software development in India." Per a Goldman Sachs analyst, IBM expected net savings of \$300-400 million from "moving more of its services delivery and support to lower-cost countries and increasing integration between its various geographies."⁷³ IBM was also a major competitor India's domestic IT Services market.

IBM asserted, however, that its shift to global delivery was about much more than labor arbitrage. Bob Moffat, SVP of Integrated Operations, explained in a podcast, "IBM really does view this on a global sense, and it's how can we leverage our multi-national presence for operational advantages, getting the right skills at the right place at the right time, at the right cost, to really leverage the worldwide pools of labor that exist, right, to really be able to give a client value."⁷⁴ IBM was also adapting its internal organization for globally integrated operations. Its "human supply chain" concept was designed to ensure optimal utilization of scarce skills on a global basis, though there were indications of employee resistance to resulting travel and relocations.

According to a BusinessWeek article, IBM's investment in India was designed to head off Indian firms' growth in IBM's core outsourcing segment. "While Indians have had a huge impact on software programming services, they are just starting to make a mark on the strategic outsourcing

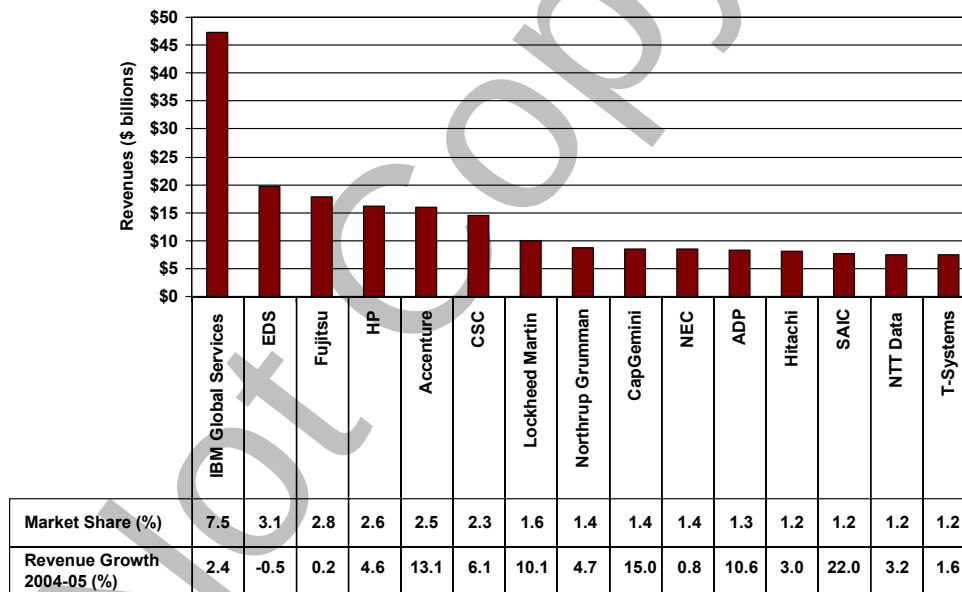
^d Not limited to IBM Global Services; includes Hardware R&D and compared versus IBM total revenues of \$91 billion USD

business – which includes managing data centers. IBM hopes that by rapidly automating data center tasks and establishing superior service processes, it will be able to establish an insurmountable lead in this area.” Larry Longseth, a VP at IBM’s strategic outsourcing unit said, “We see that if we don’t move quickly, the Indians will do to strategic outsourcing what they have done to applications development.”⁷⁵

Exhibit 1. Worldwide IT Services Spend History and Forecast by Service (USD Millions)

		2004	2005	2006	2007	2008	2009	2010
Product Support	Hardware Maintenance & Support	83,629	86,715	88,787	91,292	93,625	96,420	99,592
	Software Support	45,693	49,285	52,680	56,502	60,466	64,901	69,907
Consulting & Systems Integration	Consulting	47,912	51,613	54,945	58,881	62,684	66,652	71,015
	Development and Integration	180,638	192,534	204,007	218,058	231,382	244,829	259,344
Core Outsourcing	IT Management	146,721	154,902	163,913	176,364	189,234	203,195	218,443
	Process Management (part of BPO)	85,451	93,744	99,808	107,625	116,162	125,953	137,268
TOTAL		590,044	628,793	664,140	708,722	753,554	801,950	855,569

Source: Gartner Dataquest, Market Statistics 2006 (November 2006)

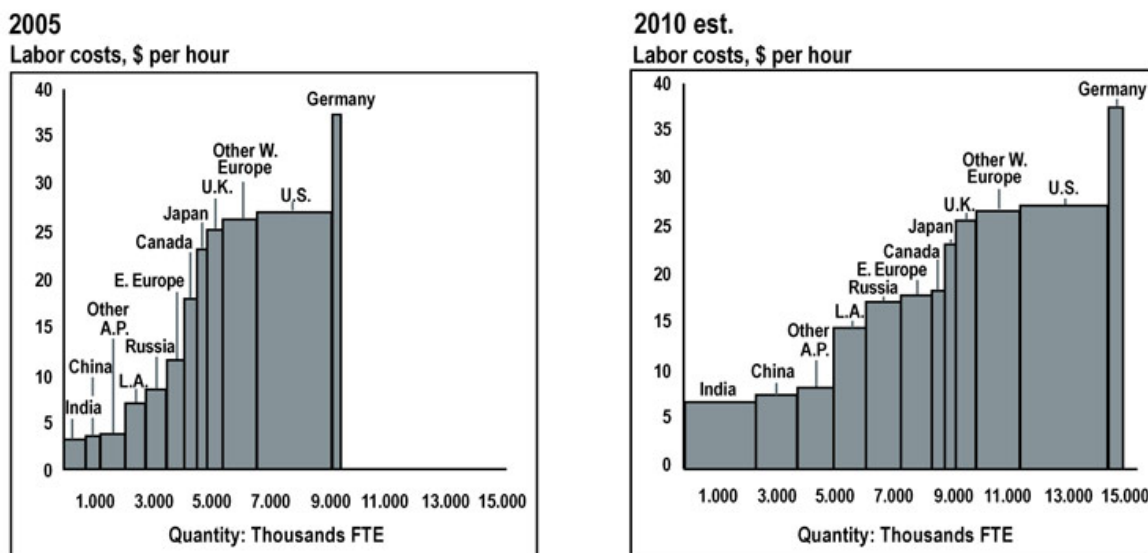
Exhibit 2. Worldwide Top 15 IT Services Vendors by Revenue, 2005 (USD Million)

Source: Gartner Dataquest (August 2006)

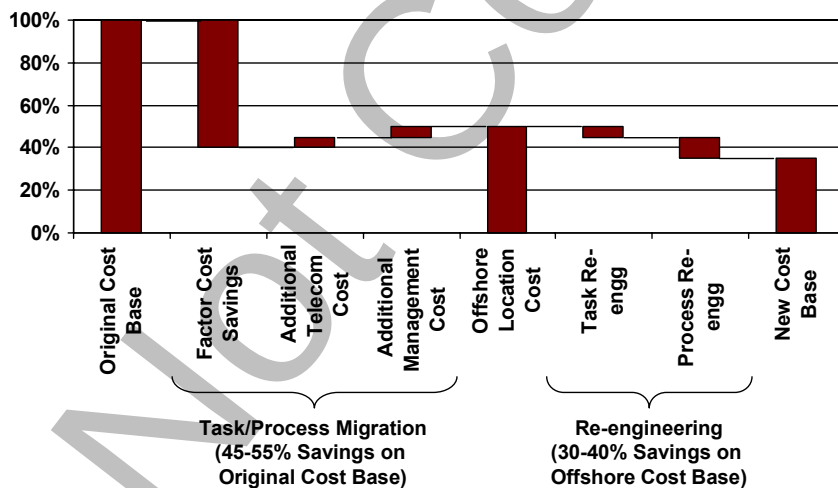
Exhibit 3. Market Share by Service, 2005

Service	TCS	Infosys	IBM	Accenture
Consulting	0.5%	0.1%	6.3%	4.1%
Development and Integration	0.7%	0.6%	8.0%	4.2%
IT Management	0.1%	0.0%	13.1%	2.0%
Process Management	0.1%	0.1%	1.7%	2.5%
Software Support	1.1%	1.1%	3.4%	0.6%

Source: Gartner Dataquest (August 2006)

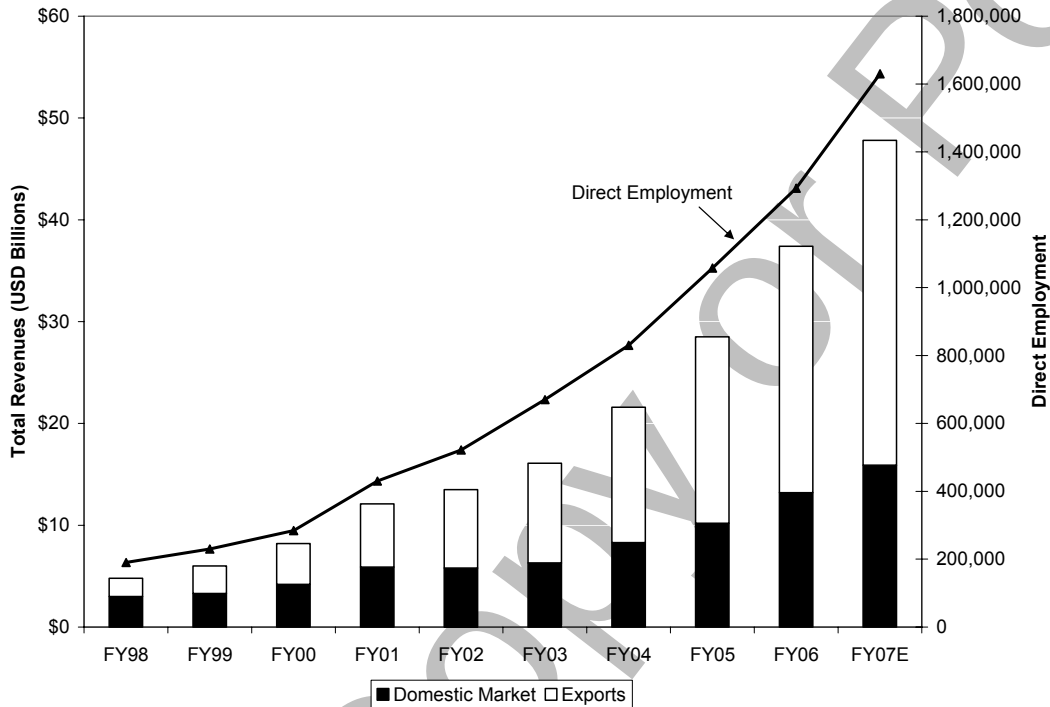
Exhibit 4. Evolution of Global Skilled Workforce (Hourly Labor Cost versus Thousands of FTEs)

Source: IBM (based on IDC; MGI Labor Database; McKinsey analysis; IBM analysis)

Exhibit 5. Cost Comparison Onshore versus Offshore (IT and ITES)

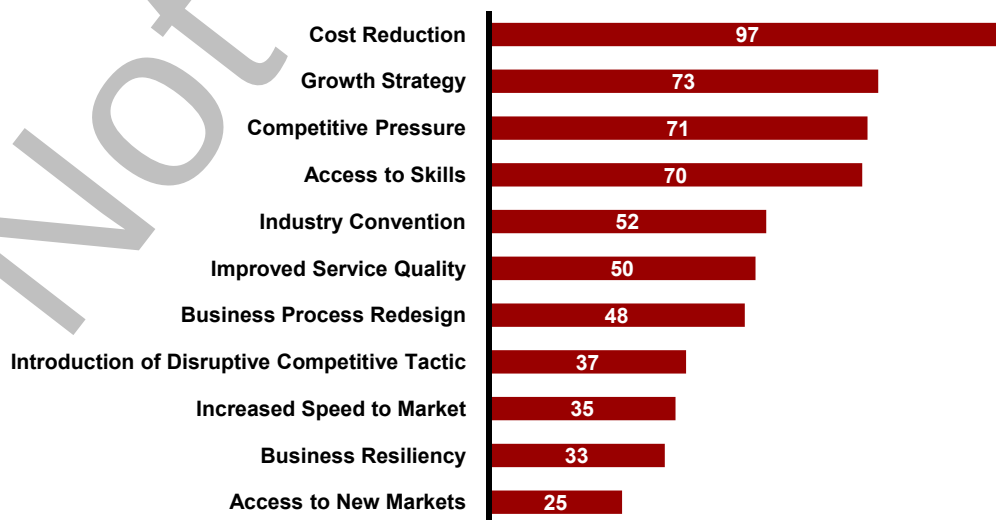
Source: Nasscom (Nasscom Strategic Review 2007, p. 97) based on McKinsey Global Institute and Everest Research (2006)

Exhibit 6. Growth of Indian IT (including hardware, software, and services) and Related Business Services Industry (IT and ITES)



Source: Nasscom (Nasscom Strategic Review 2007, p. 54)

Exhibit 7. Motivators of Offshoring and Outsourcing (IT and ITES)



Source: Offshoring research Network; Duke University Fuqua School of Business; 2006, cited in Nasscom 2007 India Leadership Forum Key Observations

Exhibit 8. Indian IT Services Exports: Growth Trends in Key Service Categories (USD Billion)

	FY 2004	FY 2005	FY 2006
<i>Project-oriented engagements</i>	4.04	5.58	7.71
Custom application development	3.71	4.98	6.54
IT consulting	0.13	0.25	0.35
Systems integration	0.15	0.20	0.37
Network consulting and integration	0.05	0.15	0.17
Software Testing	-	-	0.28
<i>Outsourcing engagements</i>	2.57	3.29	4.36
Application management	2.27	2.69	1.59
IS Outsourcing	0.30	0.60	0.84
Others (SOA, Web Services, E-business/E-commerce)	-	-	1.94
<i>Support and Training</i>	0.64	1.10	1.23
Total	7.25	9.96	13.305

Source: Nasscom (Nasscom Strategic Review 2006, p. 60 and Nasscom Strategic Review 2007, p. 142)

Exhibit 9. Indian IT Sector: Knowledge Professionals Employed (excluding Hardware)

	1999-00	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
IT, Engineering and R&D, Software Products Exports	110,000	170,000	205,000	296,000	390,000	513,000	690,000
IT-enabled services Exports	42,000	106,000	180,000	216,000	316,000	415,000	553,000
Domestic sector	132,000	246,250	285,000	318,000	352,000	365,000	378,000
Total	284,000	522,250	670,000	830,000	1,058,000	1,293,000	1,621,000

Source: Nasscom (Nasscom Strategic Review 2006, p. 145, Nasscom Strategic Review 2007, p. 146, and Press Release date July, 2, 2007.)

Exhibit 10. Indian IT Services Sector: Median Pay (INR '000s)

Description	Level	2003	2004	2005	2006
Software Engineer	HA 1	267	290	322	376
Sr. Software Engineer	HA 2	424	439	491	560
Team Leader/Module Leader	HA 3	583	655	750	847
Project Leader	HA 4	850	935	1,004	1,216
Project Manager	HA 5	1,178	1,362	1,446	1,727
Programme Manager/Sr. Project Manager	HA 6	1,801	1,884	2,164	2,467
Head – Software Dev/Large Business Unit	HA 7	2,670	2,740	2,912	3,404
Average Exchange Rate (INR/USD)		46.7	45.3	44.1	45.3

Source: Nasscom Strategic Review 2006, p. 150 and Nasscom Strategic Review 2007, p. 147

Exhibit 11. Technical Wage Growth in United States

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Computer Programmers	\$20.43	\$22.06	\$22.29	\$23.33	\$24.31	\$24.84	\$28.90	\$28.98	\$30.89
Computer Systems Analysts/Scientists	\$26.79	\$27.89	\$28.49	\$29.26	\$30.33	\$32.86	\$33.25	\$35.12	\$35.28

Source: U.S. Bureau of Labor Statistics (Department of Labor) National Compensation Survey

Exhibit 12. TCS Historical Income Statements (as reported, USD in Millions)

	FY02*	FY03*	FY04*	FY05*	FY06	FY07
Consultancy Services	844.4	1,075.7	1,499.4	2,086.7	2,710.6	4,084.3
Sale of Equipment & Software Licenses	49.2	78.1	111.0	122.0	189.8	202.2
Other Revenues	7.5	11.0	13.5	20.8	68.0	-
Total Revenue	901.2	1,164.8	1,624.0	2,229.5	2,968.3	4,286.5
Cost of Services	435.6	603.9	780.1	1,121.0	1,441.7	2,239.3
Cost of Equipment and Software Licenses	43.1	70.3	99.1	114.7	165.6	156.0
Selling, General & Administrative Exps.	160.3	224.1	321.9	457.0	592.1	812.7
Research & Development	3.8	4.2	6.9	7.4	9.4	9.9
Total Operating Expense	642.8	902.6	1,208.0	1,700.1	2,208.8	3,218.0
Operating Income	258.4	262.2	416.0	529.4	759.5	1,068.5
Net Income Before Taxes	278.1	278.7	438.5	577.0	763.8	1,113.1
Net Income	227.7	230.9	373.2	470.3	646.1	950.4

Note (*): Excluding Tata Infotech Limited
Source: TCS

Exhibit 13. TCS Historical Balance Sheet Summary (as reported, Millions of USD)

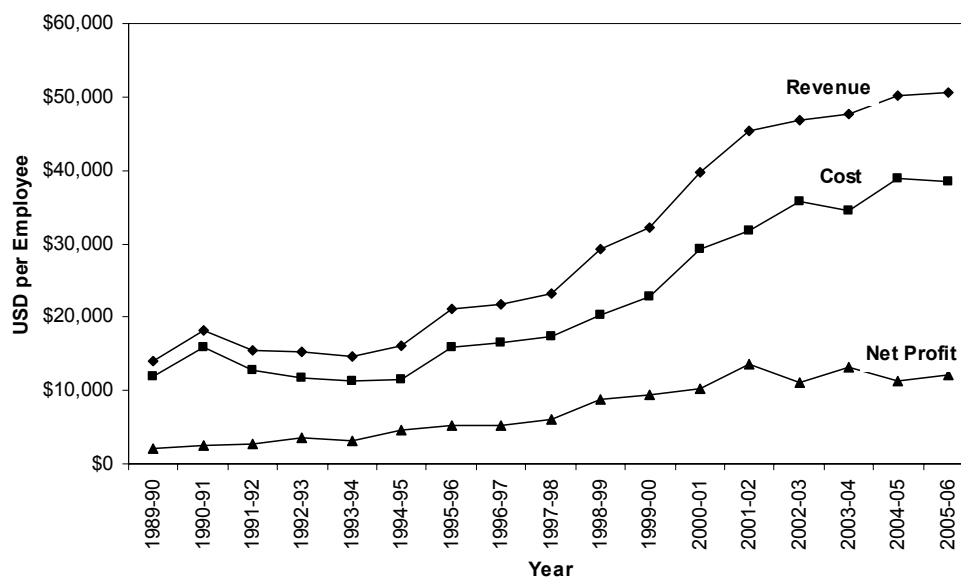
	FY03*	FY04*	FY05*	FY06	FY07
Cash & Cash Equivalents	28.1	35.7	60.3	88.9	282.8
Accounts Receivable	299.1	315.5	466.3	734.8	991.3
Unbilled Revenues	61.9	75.8	50.5	105.6	180.2
Prepaid Expenses & Other Current Assets	122.4	85.3	126.4	182.3	267.6
Total Current Assets	511.6	512.4	703.5	1,111.6	1,721.9
Investments	4.4	7.1	95.9	158.8	291.2
Land & Building	82.7	163.5	168.7	209.7	252.9
Computer Equipment	97.5	47.5	77.5	134.5	143.3
Furniture, Fixture & Office Equipment	40.6	63.3	82.1	116.8	154.4
Accumulated Depreciation	121.9	87.8	122.8	223.0	227.6
Others	56.5	87.5	116.2	410.6	669.3
Total Assets	671.4	793.4	1,121.0	1,918.9	3,005.5
Current Liabilities	360.1	378.5	346.6	531.2	735.2
Long Term Debt	0.8	-	-	33.3	138.5
Deferred Income Tax, Minority Interest, Other Long Term Liabilities	31.0	39.2	41.4	45.4	69.1
Total Liabilities	391.9	417.7	388.1	610.0	942.9
Total Equity	279.5	375.7	732.9	1,308.9	2,062.6
Total Liabilities & Equity	671.4	793.4	1,121.0	1,918.9	3,005.5

Note (*): Excluding Tata Infotech Limited
Source: TCS

Exhibit 14. TCS Cost Structure Breakdown (Rs. Millions)

	FY05	FY06	FY07
Cost of Revenue			
Employee Cost	41,906.12	56,900.90	82,657.09
Equipment & Software	5,004.34	7,421.11	6,783.25
Depreciation	1,111.69	1,931.22	2,912.03
Travel	1,923.18	2,354.20	2,531.27
Communication	808.32	1,184.52	1,526.11
Rent		1,056.78	1,602.55
Other Costs	1,463.11	2,684.23	6,113.83
Total	52,216.76	73,532.96	104,126.13
SG&A			
Employee Cost	8,483.32	12,339.10	18,858.91
Bad Debts & Provisions for Doubtful Debts	414.90	405.23	253.66
Depreciation	465.64	878.64	1,383.95
Rent	1,288.65	1,073.97	1,819.65
Travel	916.32	1,904.18	2,564.70
Communication	635.55	876.81	1,062.30
Recruitment and Training	412.01	785.45	1,319.08
Professional Fees	1,283.10	1,163.65	1,419.62
Other Costs	3,903.03	5,185.87	6,647.22
Research and Development	324.86	415.04	432.50
Total	18,127.39	25,027.94	35,761.59

Source: TCS Presentations to analysts on April 17, 2006 and April 16, 2007

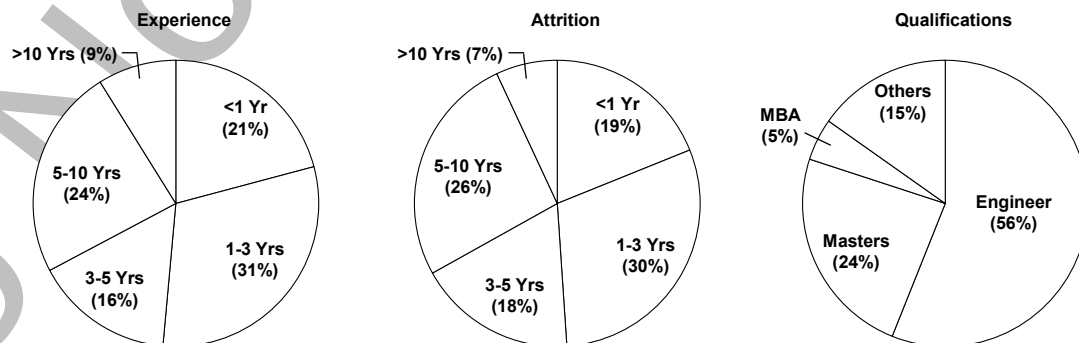
Exhibit 15. TCS Standalone Per-employee Revenues, Costs, and Profits in USD (1989-90 to present)

Source: TCS

Exhibit 16. Comparative Financial and Human Resources Metrics, last completed fiscal year

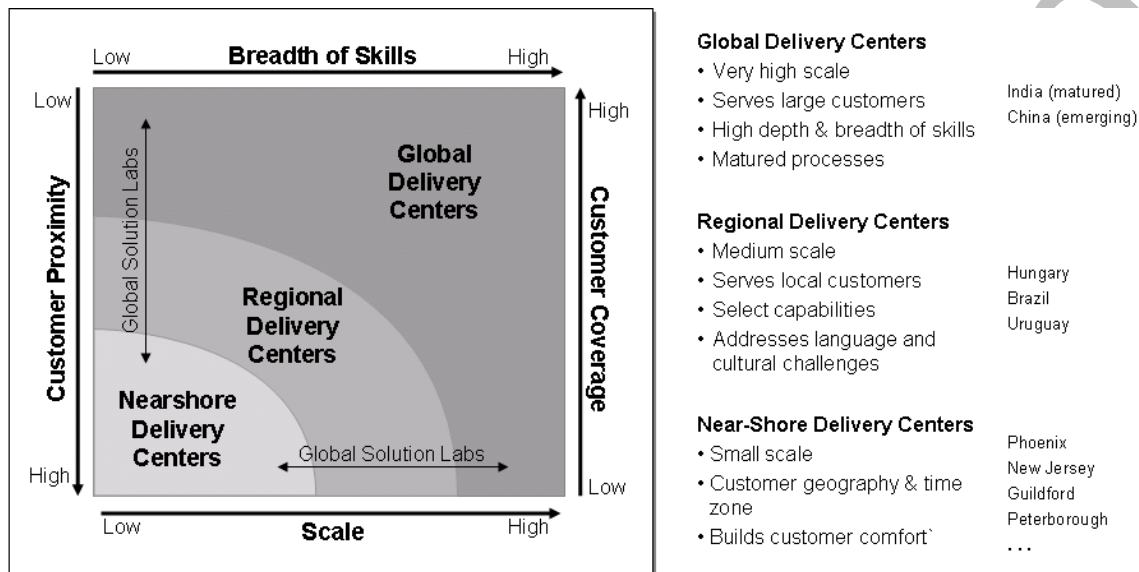
	TCS Year Ending Mar 07	Infosys Year Ending Mar 07	Cognizant Year Ending Dec 06	IBM Global Services Year Ending Dec 06	Accenture Year Ending Aug 07
Financials					
Revenue (in \$B)	4.3	3.1	1.4	48.2	21.5
4-Year CAGR (%)	27	31	40	3	9
Gross Margin (%)	44.1	46.8	44.7	25.9	28.2
Operating Margin (%)	24.9	27.9	18.0	~10.5	11.6
SG&A/Sales (%)	19.0	14.7	24.1		16.4
Geographic Breakdown of Revenues⁷⁶					
North America	52	63	86	43	43
Europe (including UK)	29	27	13	32	48
Asia, India, Rest of World	19	11	1	20	9
Onsite/Offshore Revenue Split (Q4 Only)					
Onsite Revenue (%)	56	50	60		
GDC/RDC Revenue (%)	4				
Offshore Revenue (%)	41	50	40		
Contract Type					
Time and Materials	59	73	75		
Fixed Price	41	27	25		
Human Resources					
Total Staff (Starting, 000s)	66	53	24	~190	140
Total Staff (Ending, 000s)	89	72	39	~207	170
Attrition Rate (%)	11	14	16		18
Utilization (w/ trainees, Q4) (%)	75	68	66		85
Employees w/0-3 Years Experience	49	59			

Source: TCS, Annual Reports, OneSource, Company Press Releases, Analyst Reports

Exhibit 17. TCS Workforce Profile (Q2 FY2007)

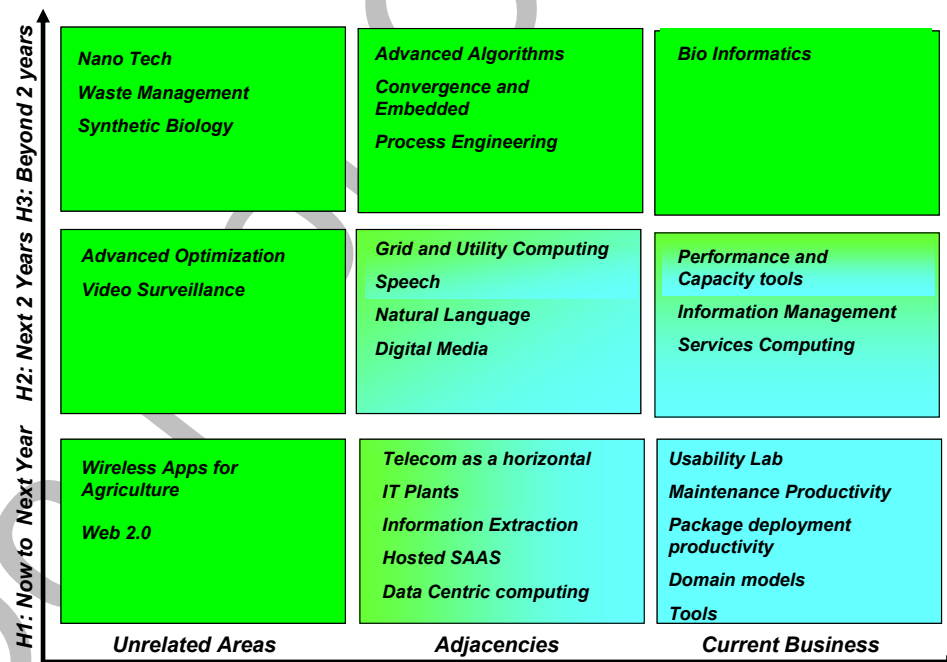
Source: TCS

Exhibit 18. TCS Global Delivery Model



Source: TCS

Exhibit 19. TCS Innovation Landscape



Source: TCS

Exhibit 20. TCS Deal Map, Early 2006

	IT Services	BPO	Consulting	EIS	Infrastructure	Asset Solutions
AMERICAS	Domain	DILIGENTA	Domain	Domain		FNS
UK						
Europe	Market-face					
APAC						
MEA						
LATAM		COMICROM				
INDIA	CMC, C-EDGE			Capability	CMC	

Source: TCS

Exhibit 21. Key Delivery Performance Indicators that are recommended to be shared with customers thru relationship portal (11 metrics)

One Global Service Standard Dashboard				
Sr No	Focus	Metric	Target	Unit
1	Schedule	On Time Delivery	> = 99	%
2		SLA Compliance	> = 95	%
3	Quality	Bad Fixes	0	%
4		Defect Free Deliverables	> = 99	%
5	Customer	Customer Complaints	0	Number
6		Customer Satisfaction Index	> = 80	%
7	Budget	Offshore Leverage	> = 60	%
		Customer Budget Variance	< = 5	%
		Attrition	< 3	%
10		S3 & E4 Professionals	> = 10	%
11	Exposure (Risk)	Project Review Coverage	> = 85	%
12		iQMS Deployment Rigor	> = 4	Sigma

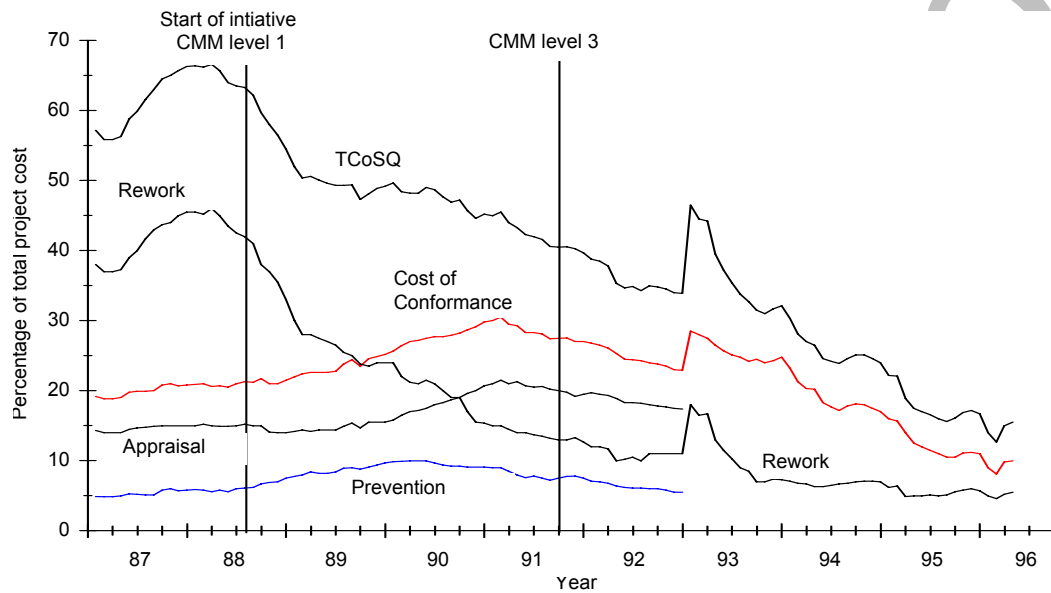
This metric is getting changed in D25 from PMP Professionals. Till the metric and the process settles down we will NOT be sharing this with our customers

TCS Confidential

3 of 34

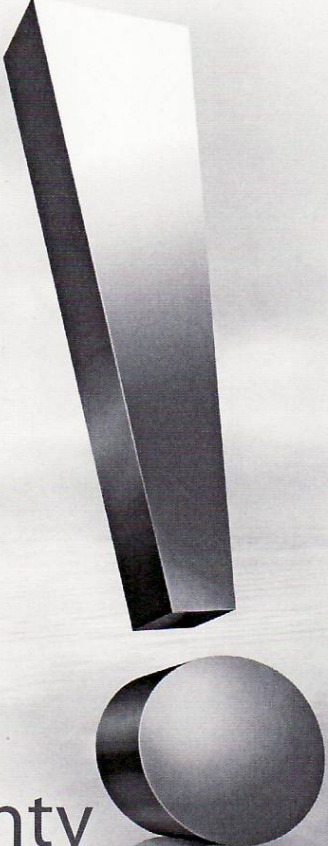
TATA CONSULTANCY SERVICES

Source: TCS

Exhibit 22. The Cost of Software Quality at Raytheon Equipment Division

Source: Dan Houston et J.Bert Keats, "Cost of Software Quality : A Means of Promoting Software Process Improvement", Quality Engineering, Vol. 10, No.3, March 1998

Exhibit 23. Launch Advertisement of TCS Experience Certainty Campaign



Promise what we deliver.
Deliver what we promise. That's

certainty

Critical situations. Ruthless competition. Unforgiving customers. Thankfully you can be absolutely sure of your IT solutions with Tata Consultancy Services (TCS). As one of the world's fastest growing technology and business solutions providers, TCS has built a reputation of delivery excellence based on world-class IT solutions that are on time, within budget and consistently deliver superior quality. So, it comes as no surprise that we pioneered the concept of the Global Network Delivery Model. Developed Innovation Labs and Solution Accelerators. Achieving a level of delivery excellence that provides greater value to our customers and is the industry benchmark. Enabling our clients to experience certainty.

TATA CONSULTANCY SERVICES
Experience certainty.

IT Services ■ Business Solutions ■ Outsourcing

To learn how your business can experience certainty, visit www.tcs.com

Source: TCS

Endnotes

- ¹ Per U.S. GAAP financials (TCS reports in both U.S. and Indian GAAP)
- ² Gartner Dataquest, Market Statistics 2006 (November 2006)
- ³ Gartner Dataquest, Market Statistics 2006 (November 2006)
- ⁴ Gartner Dataquest (August 2006)
- ⁵ Nasscom Strategic Review 2006, p. 43 and Nasscom Strategic Review 2007, p. 47.
- ⁶ Nasscom Strategic Review 2007, p. 47.
- ⁷ McLellan, Laura, "Dataquest Insight: Selection Criteria for IT Professional Services Providers Are Less Variable than Provider Think", Gartner Dataquest, August 31, 2006.
- ⁸ <http://www.sei.cmu.edu/cmmi/results.html>
- ⁹ Standish Group CHAOS report, cited by TCS internal documents
- ¹⁰ Forrester Research Business Technographics March 2005 United States Technology User Benchmark Study, cited by TCS internal documents
- ¹¹ Gartner, "Availability: How Do Your Applications Services Stack Up?" SPA-12-8280, January 17, 2001, D. Scott, cited by TCS internal documents
- ¹² Pankaj Ghemawat, "The Indian Software Industry in 2002," p. 2.
- ¹³ Nasscom Strategic Review 2006, p. 179.
- ¹⁴ Nasscom Strategic Review 2006, p. 136-137. Disaggregated figures for FY 2006 were unavailable, but India's combined share of offshore IT and ITES was estimated to be 58% that year, according to Nasscom Strategic Review 2007 page 50.
- ¹⁵ Nasscom Press Release, "Indian IT Software and Services Revenues to reach U.S. \$50bn mark by FY07-08", July, 2, 2007 and Nasscom 2007 IT Services Market Factsheet (February 2007). Total IT Services revenue estimate of \$23.5 billion is based on sum of \$18.0 billion export revenues (from July 2007 press release) and \$5.5 billion estimated domestic IT Services, based on \$8.2 billion total domestic IT and ITES revenues (from July 2007 press release) and estimated 66.6% ratio of IT Services to total domestic revenues (from February 2007 Fact Sheet). Final breakdown of domestic revenues was unavailable.
- ¹⁶ Nasscom Strategic Review 2007, pp. 56-57.
- ¹⁷ TCS Internal Documents
- ¹⁸ Nasscom Strategic Review 2007, p. 58.
- ¹⁹ Association for Computing Machinery, "Globalization and Offshoring of Software: A Report of the ACM Job Migration Task Force," 2006, p. 26
- ²⁰ Gartner, "Positions 2005: Global Sourcing and the Impact of New Delivery Models on IT Services," March 1, 2006, p. 3.
- ²¹ Nasscom Strategic Review 2007, p. 131.
- ²² CRA Taulbee Survey, cited in Computing Research News, May 2007.
- ²³ CRA Taulbee Survey, cited in Computing Research News, March 2007.
- ²⁴ UCLA HERI Survey of College Freshmen, cited in Computer Research News, May 2005.

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- ²⁵ U.S. Department of Labor Bureau of Labor Statistics, Occupational Projections and Training Data, 2006-07 Edition
- ²⁶ Phillip J. Hatch, "Offshore 2005 Research: Preliminary Findings and Conclusions," Ventoro, LLC, January 22, 2005, pp 16, 22.
- ²⁷ Pew Research Center, poll conducted between 3/10/2006 and 3/12/2006, sample size of 795 adults, accessed via National Journal Polltrack.
- ²⁸ Nasscom Strategic Review 2004, p. 88.
- ²⁹ Nasscom Strategic Review 2006, p. 52.
- ³⁰ Nasscom – McKinsey Report 2005: Extending India's Leadership in the Global IT and BPO Industries, December 2005, p. 46 and p. 191.
- ³¹ Stephanie Moore, "Cognizant's Secret Sauce: Best Practices in Getting to Know your Customer," *Forrester Research*, July 27, 2005.
- ³² The Hindu Business Line, "IBM Headcount Crosses 50,000," January 22, 2007.
- ³³ BusinessWeek, "IBM Wakes Up to India's Skills," June 5, 2006.
- ³⁴ EDS Press Release, "EDS Puts 'Mphasis' on Best Shore Global Service Delivery Strategy," June 8, 2006.
- ³⁵ BusinessWeek, "How Accenture One-Upped Bangalore," April 23, 2007.
- ³⁶ Wachovia, "Accenture: Positive Day with Management Separating Itself From The Pack," March 29, 2007.
- ³⁷ Nasscom Strategic Review 2006, pp. 44-50.
- ³⁸ Nasscom Press Release, "Indian IT Software and Services Revenues to reach U.S. \$50bn mark by FY07-08", July, 2, 2007.
- ³⁹ Nasscom Strategic Review 2006, p. 147.
- ⁴⁰ Nasscom Strategic Review 2007, p. 147.
- ⁴¹ Nasscom Strategic Review 2006, p. 181.
- ⁴² The Financial Express, "IBM's Indian Rope Trick," June 10, 2006.
- ⁴³ Robert E. Kennedy, "Tata Consultancy Services: High Technology in a Low Income Country," HBS Case 9-700-092, March 8, 2001, p 7.
- ⁴⁴ U. Srinivasan Rangan, "Report on the Software Industry of India," 1995, pp. 62-64.
- ⁴⁵ Robert E. Kennedy, "Tata Consultancy Services: High Technology in a Low Income Country," HBS Case 9-700-092, March 8, 2001, pp. 8-9.
- ⁴⁶ U. Srinivasan Rangan, "Report on the Software Industry of India," 1995, p. 70.
- ⁴⁷ TCS Internal Documents
- ⁴⁸ TCS Annual Report 2005-2006, pp. 19-21.
- ⁴⁹ Deutsche Bank, "TCS: King of the Hill", January 25, 2005.
- ⁵⁰ Venkatasha Babu, "The Race to \$10 Billion" in *Business Today*, May 21, 2006, p. 75.
- ⁵¹ TCS Press Release: "TCS in Major Expansion Drive in Thiruvananthapuram," April 15, 2003.
- ⁵² TCS Annual Report, FY 2005.

-
- ⁵³ TCS Q4 FY2005-06 Presentation to Analysts, 17 April 2006, p. 19.
- ⁵⁴ Thomas Friedman, New York Times, September 22, 2006
- ⁵⁵ Credit Suisse First Boston, "Tata Consultancy Services: Blazing a New Trail", June 20, 2005, p. 11.
- ⁵⁶ US National Institute for Standards and Technology, May 2002, Economic Impact of Inadequate Infrastructure of Software Testing
- ⁵⁷ TCS "Value Infinite" Corporate Brochure
- ⁵⁸ M. Anand, "India's Corporate R&D," *BusinessWorld*, December 25, 2006, p. 51.
- ⁵⁹ TCS Internal Documents
- ⁶⁰ S. Ramadorai speech at TCS Customer Meet
- ⁶¹ http://contentlinks.asiancerc.com/Investor/ads_premium.asp
- ⁶² TCS Press Release: "Tata Infotech Ltd merges with Tata Consultancy Services Ltd", July 15, 2005.
- ⁶³ Knox's Theoretical Model for Cost of Software Quality (Digital Technical Journal, vol.5, No. 4., Fall 1993, Stephen T. Knox.), cited by TCS internal documents
- ⁶⁴ Ronald Radice, "D25 Analysis Report for Tata Consultancy Services", October 13, 2006.
- ⁶⁵ Citigroup, "Infosys Technologies: Buy: Disappointing Quarter; Strong Outlook", April 13, 2007.
- ⁶⁶ Venkatasha Babu, "The Race to \$10 Billion: Who Will Get There First: TCS, Infosys, or Wipro?," *Business Today*, May 21, 2006.
- ⁶⁷ Infosys Annual Report FY 2006, p. 145.
- ⁶⁸ The Economic Times, "Infy: Progeon may shed its BPO name", April 12, 2006.
- ⁶⁹ Estimate
- ⁷⁰ IBM Annual Report 2006
- ⁷¹ BusinessWeek Online, "The 100 Top Brands 2006"
- ⁷² IBM Q3 2007 Earnings Release, October 16, 2007.
- ⁷³ The Financial Express, "IBM's Indian Rope Trick," June 10, 2006.
- ⁷⁴ IBM Investor Forum Webcast: Global Delivery, June 5, 2006.
- ⁷⁵ Steve Hamm, "IBM Wakes up to India's Skills," *Business Week Online*, June 5, 2006
- ⁷⁶ IBM geographic breakdown is corporate data for all of IBM from Q3 2006, not only Global Services segment; in Accenture geographic breakdown revenues shown under North America include Latin America and revenues shown under Europe include Middle East and Africa.