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Infosys: Financing an Indian Software Start-Up

It was late afternoon rush hour on January 13, 1999 and N. R. Narayana Murthy and Nandan Nilekani had just arrived from another business trip to the United States. As he watched the heavy traffic in the crowded streets of downtown Bangalore, Murthy thought "I must have made this trip several hundred times since founding the company back in 1981." Tiring as it may be, it was an essential element of his business. Murthy was CEO and Chairman, and Nilekani was President and COO, of Infosys Technologies Ltd. ("Infosys" or the "company"), a company located in Bangalore, India that developed software and provided information technology (IT) consulting services for international clients. But this time, Murthy and Nilekani were not coming back from a visit with customers but with U.S. investment bankers. Infosys had gone public on the Bombay Stock Exchange ("BSE") in 1993 but was now considering an offering in the United States that would include a listing on one of the U.S. exchanges. As the driver of the EuropeCar dodged the traffic of the streets of Bangalore, several questions rushed through Murthy's head. Did it make sense to go ahead with the U.S. offering from a strategic standpoint? From a financial standpoint? If they completed the offering, which of their courtiers should they go with: the tech-laden NASDAQ or the more prestigious NYSE? What were their alternatives outside of an offering and what were the relative merits of each?

On their way to the Infosys Campus, Murthy and Nilekani passed the Indian subsidiaries of IBM, Hewlett-Packard, and Microsoft. Even though the offering was important, there was still business to attend to in terms of running Infosys' operations. Infosys was on the high of a run on the BSE (see Exhibit 1), but that was no cause for over excitement. "We have a moral obligation to all of our shareholders—our employees and our financial investors—to keep posting results that will give adequate returns to them, and to run this company while keeping with the highest principles of corporate governance," Murthy often explained. "That is quite a task." With all of these concerns swimming through Murthy's head, the car pulled up to the driveway of the Infosys Campus. The security guard saluted as Murthy and Nilekani talked about the long night ahead.

India and Software—An Uncommon Match?

The civilization of the Indian sub-continent dates back about 5,000 years, when cities thrived in the Indus valley. Invading forces from across the region established a series of powerful empires over the centuries, including the Muslim Mughal emperors (see Exhibit 2 for a map of India). The resulting mix of ethnic and religious groups and the emergence of social structures such as the Hindu caste system laid the foundations for much of contemporary India.

Dean's Fellow, William J. Coughlin, MBA '99 prepared this case under the supervision of Professor Walter Kuemmerle as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

From the 15th to the 17th centuries, European traders maintained a limited presence in the subcontinent, eventually overshadowed by the more aggressive interests of the British. By around 1840, the mandate to rule India eventually went to the British crown.

British rule in India ended in 1947 after a sustained campaign for independence. Soon after independence, India was partitioned amid great bloodshed to create the Islamic State of Pakistan, while India assumed a secular constitution. India's first Prime Minister was Jawaharlal Nehru, leader of the Indian National Congress. Under his government, India established a complex system of socialist economic controls. From the early 1980s, there was a growing consensus in the country in favor of economic liberalization. Political inertia and powerful vested interests initially ensured that little was done, save for limited incentives to exporters, minor industrial deregulation and some simplification of the taxation regime. But a serious financial crisis in 1991 led to emergency IMF funding, and changes were introduced to reduce government control of the economy (see Exhibit 3 for economic information on India).[1]

The economic policy supported by the government prior to 1991 caused many problems for business, especially for those businesses that wanted to import goods from a foreign market. In 1981, it would take 18-24 months to import a computer. Furthermore, the infrastructure in India was very poor; a telecommunications facility was not simply costly, but really not available. It wasn't until 1985 that the first satellite communications link was set up. In the light of India's poorly developed technology infrastructure and import restrictions it seemed somewhat unlikely in the 1980s that Indian software firms could grow at a rapid pace. On the other hand, India's top universities produced a large pool of highly skilled engineers with sound mathematical and analytical training.

This labor pool was faced with a lack of employment opportunities in traditional manufacturing industries and at the same time particularly qualified to develop software. Computer software consisted of the programs, routines, and symbolic languages that controlled the functioning of computer hardware and directed its operations.[2] Estimates of the size of the global software industry in 1999 ranged from $300 billion to up to $750 billion if the software development performed by users in-house was included.[3] The industry was growing at 15-20% rates, and even faster than that in developing countries, although more than 80% of demand was in developed countries.

Based on a survey by the software industry association, NASSCOM, India's software exports increased from $128 million in 1990-1991 to $2.65 billion in 1998-99 representing a compound annual growth rate of 46%. In 1999 software accounted for approximately 5% of the country's total exports, and the industry was projected to grow to $3.9 billion in 1999-2000.[4] (See Exhibit 4 for data on India's software industry). North America (the United States and Canada) absorbed 61% of Indian software exports, Europe 23%, Japan 4%, and Southeast Asia 4%. The North American share was down from nearly 80% in the 1980s (see Exhibit 5 for the top five Indian software exporters). Domestically, India was plagued by software piracy rates estimated at approximately 70%.

Indian exporters concentrated on support services, maintenance and the like (in which their share of world demand was estimated to be 10% or more)[5], rather than on higher-end services such as application solutions and software consulting or the development and marketing of packaged software. However, several successful Indian software firms had recently added IT consulting and

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[1] The preceding part of this section was adapted from the Economist Intelligence Unit, *Country Profile: India*.

[2] The remaining paragraphs in this section were adapted from "The Indian Software Industry at the Millenium," by Pankaj Ghemawat, (HBS No. 700-036).

[3] Paul Taylor, "India's IT Mantra," Survey of Indian Information Technology, *Financial Times*, December 2, 1998.

[4] The NASSCOM data cited here and in the rest of this case are all drawn from that organization's website unless noted otherwise.

[5] Paul Taylor, "Software Exports," Survey on Indian Information Technology, *Financial Times*, December 2, 1998.

related high-end services to their offering. Services performed on-site (at the client site) accounted for 59% of India's software exports in 1998-1999, compared to 95% in 1990. The shift from onsite toward offshore[6] (i.e., in India) business had been accompanied by significant changes in contractual form.[7] Lower-end work was typically governed by time-and-materials contracts, and higher-end work by fixed-price contracts, which were particularly subject to large overruns, a large fraction of which were typically borne by the Indian software vendor (see Exhibit 6 for information on the "value chain" in software).

Issues of contractual form continued to be important because customized software continued to dominate India's software exports: standardized products and packages, which typically required large investments in R&D and marketing, accounted for only about 10% of total exports. Once again, Indian exporters concentrated on the low-end of this segment; on systems software and utilities and niche products for other developing countries rather than, for example, mass-market applications. The share of packaged software in Indian exports had actually slipped towards the end of the millennium because of the increasing focus on Y2K solutions (and the emergent demand for Euro conversions). Y2K-related revenues accounted for about 20% of total exports.

Infosys—The Beginning

Narayana N. R. Murthy was born the son of a schoolteacher in 1946. He grew up in a modest environment and graduated with Masters degrees in Electrical Engineering and Computer Science from I.I.T Kanpur in 1969. After graduation, he took a job in Paris instead of pursuing a higher degree:

> I was preparing to go to either the United States or Israel for a Ph.D. when the job in Paris was offered to me based on a paper I had presented in Italy. Professionally, it gave me a chance to be part of a team that was to design a huge new operating system. But, for me personally, the job was even more compelling. I was 23 years old and, like all good Indians at the time, I was something of a socialist who lived on a heavy diet of Nehru's socialist philosophy. So, for me, post-1968 Paris was a very interesting time.

The decision worked out to Murthy's expectations. In 1971, Murthy found himself in the midst of the post 1968 student revolution. During his time in Paris, he attended talks by existentialists, and even met the head of the French Communist Party. These interactions and experiences gave him a chance to formulate his personal philosophy on life:

> With a reasonably active Communist Party, I was able to witness first hand the maximum impression of socialism and I came away with four observations. First, the only way a society can create wealth for people is not by distributing it but by actually fostering its creation. Second, after looking at business as a whole, I came to grudgingly acknowledge that there are relatively few people who are capable of leading the creation of wealth on a meaningful scale. Third, good people need the proper incentives—money, power . . . whatever, it can take many forms—to create that wealth. My greatest insight out of all of this was that it is not the job of the government to create wealth but to create the environment where the incentives for wealth creation exist.

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[6] The offshore percentage includes packages developed in India that were sold overseas.

[7] The discussion in this paragraph is based on Abhijit V. Bannerjee and Esther Duflo, "Reputation Effects and the Limits of Contracting: A Study of the Indian Software Industry," unpublished working paper, MIT, June 9, 1999.

When his tour in Paris was completed, Murthy hitchhiked back to India over the course of the next year living on the $450 he had saved for himself. After a two and a half-year stint with a public sector think tank, he decided that the public sector was not for him. "I wanted to see first hand how wealth was created and to see if I could make it," he said. So in 1977 he joined a start-up of a friend of his called PCS and became the head of the software group. But soon he wanted to create his own enterprise and, after four years at PCS, he left to start Infosys with six other PCS employees.

While the seven founders had complementary skills in finance, technology, human resources and marketing, they shared the vision of creating wealth in a legal and ethical manner and going public in ten years. But they were short on capital. Venture capital did not exist in India at that time and banks did not provide funds without collateral. Furthermore, none of the founders had ties to significant family money or to one of the large Indian family group companies. Thus, the founders started with just $1,000.

Because the domestic market held no real opportunity for the new company, Infosys focused on international markets for its software products. Indian-made computer hardware was not sufficient for development of software that could meet the demands of an international market, so Infosys had to use foreign equipment. However, because of the laws existing in India at the time, hardware was virtually impossible to import, even if the firm had the money to do so. As a result, the company had to perform the work on customer's equipment outside of India:

> We struck a deal with a company in New York that needed to upgrade its systems from a 16-bit to a 32-bit computer. So we went to the United States and met with them. We said, "Here are our strengths and here is how we can add value for you, but here are our constraints." And they said, "No problem. You can use our equipment." We entered into a six-year contract where they paid all of our expenses, let us use their equipment and paid us a consulting fee.

With that, Murthy sent the founding members to New York to work on the project and Infosys had officially begun operations.

Managing and Financing Growth

Weathering the Early Storms

Infosys slowly started to add new customers and to take on new projects over the next several years. From 1981 through 1989, the company grew from its original seven founders to a company with over 100 people. Despite some early cash flow concerns, operations were running relatively smoothly until the crisis hit in 1989. Murthy offered the following summary:

> In 1989, we almost closed down business. The turning point was when one of the founders left the firm and migrated to the United States. Infosys had customers but was still fledgling. Because the factor conditions hadn't changed dramatically, we were forced to send people outside of India to complete the work. 90% of the work was still being performed outside of India at the client site. This wasn't the vision we had for the company; we wanted to add maximum value *inside* of India.

Nilekani agreed with Murthy's assessment. "The departure of a founder brought the realization that we were executing a bad strategy. Steady growth with a low profile just didn't work.

Some MNCs (Multi- National Corporations) were already here and we knew more would come. If we didn't do something, we knew we would get crushed, especially on the people side."

At that point, Murthy called a meeting and offered to buy out all the shares of the remaining founders. (See Exhibit 7 for resumes of Infosys remaining founders.) Within half an hour, the other five founders rallied behind him and vowed to continue with Infosys. An external booster followed this new internal impetus - the liberalization of the Indian economy. There were five key reform measures that made a difference for the Indian software industry. These were a more responsive government, the establishment of software development parks, current account convertibility, the permission of 100% foreign ownership for any high technology company, and the elimination of government dictated pricing of new equity securities. In 1983 the company moved its headquarters from Bombay to Bangalore because of the better access to engineering talent and because of better quality of life there which would help in attracting engineering talent from all over India.

Infosys' Financial History

Infosys had used little outside capital to fund its business. Beyond the initial $1,000 on which the company was founded and periodic working capital funding, there had only been six outside capital infusions prior to January 1999. These capital infusions took the form of four loans ($225,000 in fiscal year 1986, $250,000 in fiscal year 1989, $150,000 in fiscal year 1991, and $100,000 in fiscal year 1992) for purchasing hardware and other moveable property, an IPO in 1993, and a private placement to international investors in fiscal 1995. Infosys CFO, Mohandas Pai, explained the company's financing philosophy:

> The financing history of Infosys is partially the history of the business and partially the culture instilled by Murthy. Service businesses generally have positive cash flow and this helped shape our financial policy. But equally important is the company's reluctance to use debt financing. The conservative, middle class background of Murthy and the other founders has directly contributed to that reluctance. As a result, we are quite frugal and have avoided debt as much as possible. Financing has mainly been through profit retention, lower than market salaries for the founders, tight cost control (the founders always chose the low cost option provided the quality of deliverables was not compromised), and relatively low capital expenditure (computer equipment was shared between employees and fully utilized.)
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> Early on 1994, we drew up a financing policy that had three main elements. First, we need to have liquidity of up to 25% of revenue in the form of cash and liquid assets. This is to ensure we can cover our next eight months of expenses—especially salaries—at any time. Next, we pay a dividend only if we have a cash surplus above that level and it will represent no more than 20% of a year's profits. Even though we are a high growth company, Indian investors demand a dividend. Much of this stems from the old wealth tax of 2% - a tax that was levied because you owned something. Even though equity shares were made exempt from this wealth tax in 1993, Indians still look for yielding assets. We fund all capital expenditures and working capital needs out of our cash flow. Borrowing, if at all would only be a bridge to match cash flow and would always be fully collateralized by the cash balances. In those days banks were not willing to lend money to a people intensive, as opposed to an asset intensive, business. Even though debt financing is more accessible today, we still do not employ it.
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> Once the reforms were passed in 1991, we were able to take advantage of the capital markets with one of the first market-priced IPOs in 1993. There were two motivations behind the IPO. The first was to realize the value of the investment by

> the employees and to contribute to the creation of wealth in India. The second was to take advantage of the tremendous growth opportunities in India through investment in the business. One of the first investments was in new facilities that could absorb the growth we anticipated in the business. We invested Rs 130 million in the new facilities even though our 1993 revenue level was only Rs 145 million (1992 revenues were 95 million).[8] After the IPO, our business really took off—revenues doubled and we had a stock split in 1994. We started making three to five year projections and we realized we needed more resources. Since we didn't want to constrain liquidity, we decided to complete the private placement in fiscal 1995 to fuel our anticipated resource requirements.

Since that time, Infosys had seen tremendous growth in its business (see Exhibit 8 for recent financial data). These initial investments allowed Infosys to expand the scope of its business and the company had been able to generate sufficient cash flow for all of its past capital needs. During that time, Infosys had grown to become one of the largest and most successful companies in the Indian software industry. Moreover, the company achieved its goal of becoming a leader in Indian business. (See Exhibit 9 for a full list of Infosys accomplishments.)

Infosys in 1999—The Star of India?

Putting People First

Between 1989 and 1999, Infosys dramatically transformed their business and image. Where as in 1989 only 10%-20% of the work was being performed in India, operations had dramatically improved by the start of 1999. At that time, 75% of the work performed by Infosys was conducted domestically, yet only 2% of the company's sales were to Indian customers. It was estimated by industry insiders that Infosys' attrition rate was around 11%, well below the Indian average of 25%-30% in the software industry and dramatically below the 50%-60% levels found at software companies in Bombay[9]. In fact, Infosys was considered one of the most desirable places of employment among Indian students. Murthy explained the reason for the turnaround:

> The changes in government policy were a boon to our business, but they were certainly not going to make Infosys a success in and of themselves. We knew that it was up to us to create a sustainable business. But if the solutions to the problems were within Infosys, the question became "how can we transform Infosys to get people to want to work here?" We needed to create an environment where people used speed and imagination in everything that they did, where people benchmarked themselves on a global scale and where we recognized what our strategic resources were. We needed to become a globally respected firm and a leader in the Indian market.

As a result, Infosys worked to create an environment that would enhance the overall experience for employees. With the funds from the IPO in 1993, Infosys began construction of the company's "campus," a number of multi-floor buildings on a five-acre facility that includes basketball and volleyball courts, shower rooms, banking and ATM facilities, and fleet of 26 busses that ran to several different locations. "We even have sleeping facilities for the employees if a project

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[8] In January 1999, The exchange rate between the Rupee and the US Dollar was approximately Rs 42.5: $1.

[9] Source: Casewriter interviews with Indian software experts outside Infosys.

requires them to work late into the evening," explained Senior Vice President of Human Resource Development, Hema Ravichandar. She continued:

> There are three reasons why a person would stay with Infosys. People stay if there is learning value-added, if there is financial value-added, and if there is emotional value-added. We must address each of these needs if we are going to attract and retain employees.
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> On the learning side, Infosys allows you to have a chance. We give you responsibility early and allow you to progress quickly in the organization due to the fact that we are growing so fast—both in terms of revenues and employees.
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> On the financial side, it is not just salary. Infosys was the first company in India to institute a stock option plan. In addition, as a compensation benefit, we created a series of loan programs for our employees. We offer low interest and zero interest loans while the current interest rates in the market are at 16%-18%. Depending on one's level and tenure, we even offer a home loan with a second lease on property, which means employees can take an Infosys home loan in addition to another loan for a house, something which has been virtually impossible to secure for most people in India. The home loan comes with a ballooning repayment facility that means the employee can pay more as time goes by and his/her salary increases. These initiatives are the embodiment of company's philosophy of assisting in asset and wealth creation in India, but there are benefits to Infosys as well. For example, the plans are progressive in nature and are a function of level and salary; as one progresses, you first become eligible for a two wheeler loan, then for a car loan, then a home loan, and so on. As a result, the attrition rate of people who participate in the housing loan program is much lower than the overall level of 11%.
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> The emotional side, however, is perhaps the most important element we have created in this organization. The culture at a company is hugely important and is a little more difficult to quantify. For example, if someone has just lost a close relative, Infosys really helps out and is always there to get people through tough times. The friendliness, openness and transparency of the organization are really the key factors in our ability to attract and retain people.

Infosys As the Market Leader

In addition to the operating environment Infosys had created, there were several areas where Infosys had taken a leadership position in the Indian market. Much of that leadership was formalized in the Indian business environment as Murthy and other employees held numerous leadership positions in Indian business associations. Murthy served as president of NASSCOM, the software trade association in India, from 1992 to 1994.

Aside from these formal positions, Infosys had been a leader in India mostly by example. In addition to being the first company to institute an employee stock plan, they were also the first Indian company to file a 10K and the first to perform a full audit according to U.S. GAAP. Nilekani explained the push for transparency:

> Most of the large and successful companies in India have existed for some time and were run akin to personal empires, even if they are now public. In the old regime, there used to be the 2% wealth tax. Often this tax was higher than the yield the owner was receiving on the asset, which meant he would need to sell off some of this asset in order to pay the tax. What this did was create a perverse system where there was no incentive to increase the value of an asset; in fact quite the opposite was

true. People were only able to get value out of their businesses through other means, rather than through the creation of shareholder value.

As a result, there has been very little transparency in traditional Indian businesses. What we understood early on was that investors—especially foreign institutional investors—place a high value on transparency. One of the reasons why Infosys has been able to realize the value it has in the public market is its willingness to be transparent. We have won many awards, in India and throughout Asia, for the standards we have set in our reporting and disclosure policies.

Pai summarized Infosys' leadership position as follows:

Murthy has established the vision of creating maximum value in India in a legal and ethical manner, but this vision extends beyond Infosys itself. We have learned that you can create wealth in a legal and ethical manner. We have a huge competitive advantage by keeping management and ownership separate and a bigger competitive advantage through our transparency. But we do not want to just simply keep it for ourselves. We want to share all of our best practices with all Indian companies and will even help them implement it. That is how you create maximum value in all of India.

Growing Pains

Increasing Productivity

Although Infosys could look back on many accomplishments, the company faced several challenges in the months and years ahead. The major issue on the horizon was with regard to productivity. Although Infosys compared favorably to U.S. companies on a productivity basis when using operating profit as the measuring guideline, the company lagged far behind when looking at revenues per employee (see Exhibit 10 for comparable productivity data). The cause for concern was in the wage differential between India and the United States. According to Infosys, Indian wages for software engineers were growing at approximately 25% per annum (see Exhibit 11 for industry cost comparisons). With the wage differential closing, top line productivity gains were a top priority at Infosys. Murthy explained Infosys' views on the challenge:

In order to remain competitive on a global basis, we need to close the gap in per capita revenue by moving up the "value chain" of software development. To do so, we must accomplish three objectives. First, we need to increase our customer penetration. Currently, our largest project is $7 million. In order to increase our revenue base, we are going to have to a) take on more projects and b) take on bigger projects. Right now, about 80% of our revenues represent repeat business, which is on the high range of our target (70%-80% repeat business). One tool we have used to acquire a new customer is to work on Y2K projects. Although this is relatively mundane work, it has acted as an in road to the client and has allowed us to begin a partnership with the client—to begin a long-term relationship. Since this is a temporary phenomenon that is about to end, we have been very selective in the Y2K projects we have taken and have been working to decrease our exposure to the business. Our goal is to limit our Y2K exposure to 25% at its peak (see Exhibit 12 for historical and projected Y2K exposure).

In order to take on bigger projects, we need to convince the customer of our ability to do so. That leads to our second objective—increase our brand equity. We need to create a buzz around the Infosys name but we need to take a distinctive

approach. Where Andersen Consulting can enhance its brand through mass marketing, we are not in a position to do that. Our target audience is maybe 15,000 people worldwide—CIOs and executive directors. As a result, we need to focus more on seminars and direct marketing -- one-on-one customer meetings. While we have made strong inroads on this effort, we still have our work cut out for us.

A third objective is to increase the amount of fixed price contracts we work on.[10] (See Exhibit 13 for historical and projected fixed price contracts.) There are three risks in increasing that figure. First, we are not able to appropriately define the scope of the project. Second, we do not know where we are going on a project because the customer has not figured out where he/she wants to go. Third, both the customer and Infosys are dependent on a third party technology that neither of us can control. However, the customer is king and if he/she prefers for us to take up a project on a time and materials basis, we will. So increasing the mix of fixed price projects is an objective but it will take some time to achieve. Better communication with the client can fix some of these problems but not all of them.

While there were numerous challenges, Infosys felt that several of its software development concepts were cutting edge. Its "Global Delivery Model," for example, was a distributed project management methodology that divided projects into components to be executed independently and concurrently--part at the client site and the rest at remote development centers. Spreading development across time zones allowed for 24-hour workdays, and simultaneous processing of different modules accelerated delivery time of larger projects.

Cultural Concerns

In order for Infosys to accomplish many of the objectives with regard to productivity, the company believed that it would need to increase the number of foreign personnel working for the firm. As of the start of 1999, Infosys only had eight non-Indians working at the company. In order to accomplish its goal of high growth, Infosys believed that the company had to grow, both organically and, perhaps, through acquisition. "We are entering a new era where all companies want to be more global," explained K. Dinesh, director and Head of Productivity, Quality, and Management Information Systems (MIS). "Therefore, we must learn to handle different cultures better—both outside and within the firm. That growth probably can not all come organically, but we must not lose our focus or our distinctive culture. It is what makes this place special."

Hiring and Retaining Employees

The cultural issues surrounding the expansion of international personnel touched on the issue of the firm's ability to hire and retain Indian personnel as well. Infosys had seen tremendous growth in sales over the past several years and had been able to support that growth through a commensurate expansion of its headcount (see Exhibit 14 for historical sales and employment figures). In order to rapidly grow their employee base without diluting their talent pool, Infosys had carried out a rigorous interviewing process with potential candidates. "We seek the candidates that have the highest degree of learnability," according to Murthy:

[10] The company was generally engaged on projects in two manners: on a fixed price contract basis and on a time and material reimbursement basis. Fixed price contracts were generally viewed as "higher value added" projects as the software company took on increased risks (such as the length and complexity of the project, which directly effect the costs) and were compensated for managing those risks.

After looking at the resumes of potential candidates, we select a relatively small number of people for testing (see Exhibit 15 for Infosys' recruiting process and statistics). These tests consist of a set of puzzles and math algorithms in order to gauge which candidates have the highest learnability. Those candidates that pass are then interviewed for a position with Infosys.

In the past, Infosys had been able to offer a highly meritorious career path for people due to its growth. The rapid pace of growth had allowed and even demanded that it give an increasing amount of responsibility to its employees. The challenge for the company going forward was to preserve the spirit and to offer a similar career horizon for new hires in the face of an increasing base of employees.

A United States Offering—To List Or Not To List?

Facing these challenges in the marketplace, Infosys had a key decision to make at the start of 1999: whether to commence a stock offering in the United States. Infosys had gone public nearly six years earlier, listing on the Bombay Stock Exchange. That listing had not only fulfilled one of Murthy's original goals of completing an IPO of Infosys but had also fulfilled the goal of creating wealth for Infosys' managers and employees by creating a liquid asset out of the equity that they held. Although the exit event had already been created through the original IPO, Infosys viewed a U.S. offering as providing many benefits according to Nilekani:

> Our main challenge is to move up the value chain by increasing our revenues per employee and by increasing our customer base. To accomplish this goal, it is essential that we enhance our brand. Because of our size and our niche market, we cannot rely on tools like advertising and other "traditional" forms of marketing. That may work for IT consulting companies that can leverage advertising across many businesses and by doing so generate much higher revenues—but that might not work for Infosys. What we need to do is create a buzz in the market—create word-of-mouth publicity that will highlight the uniqueness of our company compared to our competitors. Currently, our competitors are perceived to be the other Indian companies in the market. We need to be viewed in relation to our "true" competitors—technology companies such as Cambridge Technology Partners in the United States. An American Depository Receipt (ADR) offering in the United States will allow us to accomplish that goal. We may be an Indian company, but most of our customers are in the United States. The U.S. offering would allow us to create and to leverage that buzz in our customers' home market.
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> Secondly, an ADR offering in the United States would help accomplish other goals, such as the recruitment of international employees. Not only would the offering enhance Infosys' image with potential employees in the United States, but it would also provide us with flexibility. We would be able to offer the potential employee a completely U.S. dollar-based compensation package as the options and stock he/she would be given will be listed in the United States. Thirdly, in addition to providing currency for our employees, a listing would also provide currency for acquisitions in the United States or any another international location. Finally, it would be helpful for our current investors as well. As 26% of our investors are located in the United States and in other locations outside India, we aim to help them by gaining government approval to allow foreign investors to convert existing shares into ADRs. This increases our degrees of freedom in how we conduct business going forward.

If we decide to go ahead with the listing, the issue of which exchange to list comes up. We have to choose between the New York Stock Exchange (NYSE) and the NASDAQ. There are benefits to listing on either exchange. As the first Indian company to list in the United States, we have a responsibility to make the right decision (see Exhibit 16 for listing considerations).

While there were clear benefits of an offering, there were also some questions surrounding the viability of an U.S. offering. First of all, it was not at all clear the company needed the extra cash that would come from an offering. More important was how the process of listing would be leveraged (see Exhibit 1 for a stock price graph for Infosys). The company had seen its stock appreciate at 142% per annum between the IPO in 1993 and 1999, which was both a tribute to the success the company had enjoyed and a tremendous responsibility for management. "Remember, we have a moral obligation, to both our employees and to our shareholders, to perform to their expectations," warned Murthy.

Wall Street research analysts also offered views on Infosys and the company's valuation. (See Exhibits 17-19 for comparable trading information, earnings forecasts, and market information). Bob Austrian, from Banc of America Securities, highlighted some of Wall Street's views:

I have positioned Infosys as "the Star of India," playing on the name of the gem in the Museum of Natural History in New York – an incredible object of priceless value. Blending world-class software services with an offshore model, Infosys has been the IT Star of India – the best in performance and growth; the best in transparency and managing expectations; the best in most everything in India. (See Exhibit 20 for estimated versus actual performance.) They had a conservative discipline in everything they did. Plus, they have been riding a very favorable trend of outsourcing IT needs. The offering would be fantastic for investors as there are very few, if any, comparable ways to invest in this part of the world and there is a huge desire to invest in international markets.

However, there are certainly some risks involved. First, the valuation is way out there—very rich by most measures. Second, there has been a serious shift in trends at the start of 1999, not the least of which is the Y2K boon to revenues subsiding in the near term. The ERP (Enterprise Resource Planning) software segment had slowed down and was way out of favor at the start of the year. And the shift to e-commerce had begun and the company needs to find a way to exploit that segment. Finally, on the company specific side, the on-going diligence situation is quite difficult for myself and for investors. With the company in India, there is no way to check up on them quarter to quarter, let alone week-to-week. These factors are not only in the minds of the investors but also the company. The last thing in the world they want to do would be to champion itself and have the market fall apart; that is very dangerous.

David Grossman, from Thomas Weisel Partners, elaborated on Infosys' prospects:

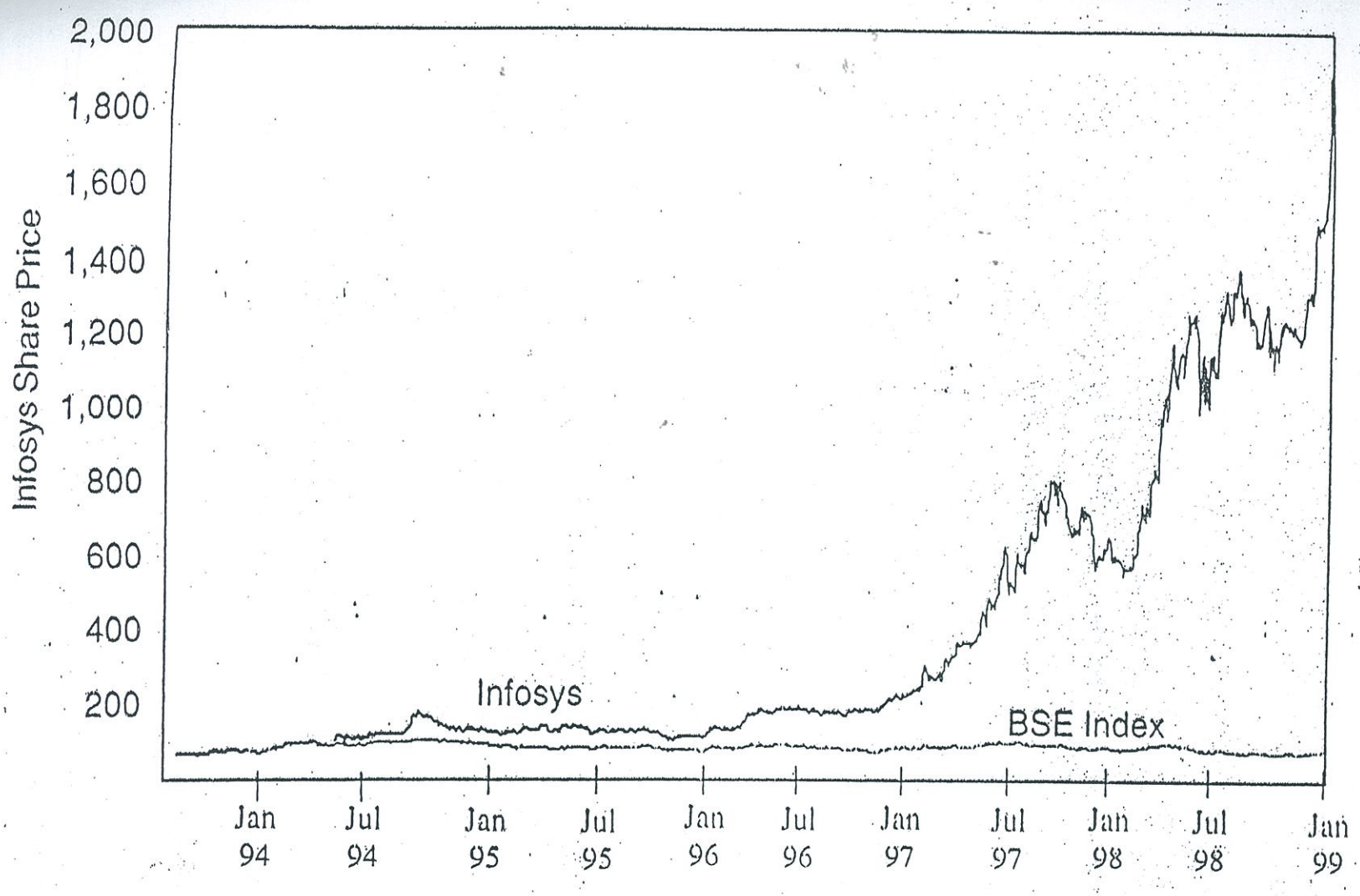
The Company was the first professional services firm to leverage in a consistent way the breadth of highly trained English-speaking technical talent in India, the cost advantages in India, and the ability to execute software development projects remotely in another country and time zone. Infosys has proven to be a master at managing offshore opportunities, especially with *new* technologies. Technology moves very fast and Infosys is always vulnerable to the risk that it will not be capable of delivering those services in highest demand with its offshore model. Other risks are that Indian companies have historically been weak in sales

and marketing, especially in the U.S. Furthermore, Infosys needs to establish a brand in the U.S. to protect its margins and drive future growth.

With all of this, Murthy asked, "The question becomes—What are our options? Does the offering really help us overcome some of our current challenges or are there other methods that would be better—or at least less 'expensive'?"

As Murthy and Nilekani walked towards their offices, they passed by the construction site at one of the buildings of Infosys' sprawling campus. Murthy observed how construction workers were unloading large batteries to be installed as a back-up for power failures. The contrast of the somewhat unreliable electricity supply in Bangalore and the campus expansion of one of the world's most advanced firms for customized software reminded Murthy of how far Infosys had come since its founding in 1981. But it also reminded Murthy of the fragility of success, especially in India. Just as the company had been on the brink of bankruptcy ten years before, improper decisions could spell trouble for the company in 1999.

Exhibit 1 Stock Price Graph



Source: Infosy

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Exhibit 2 Map of India

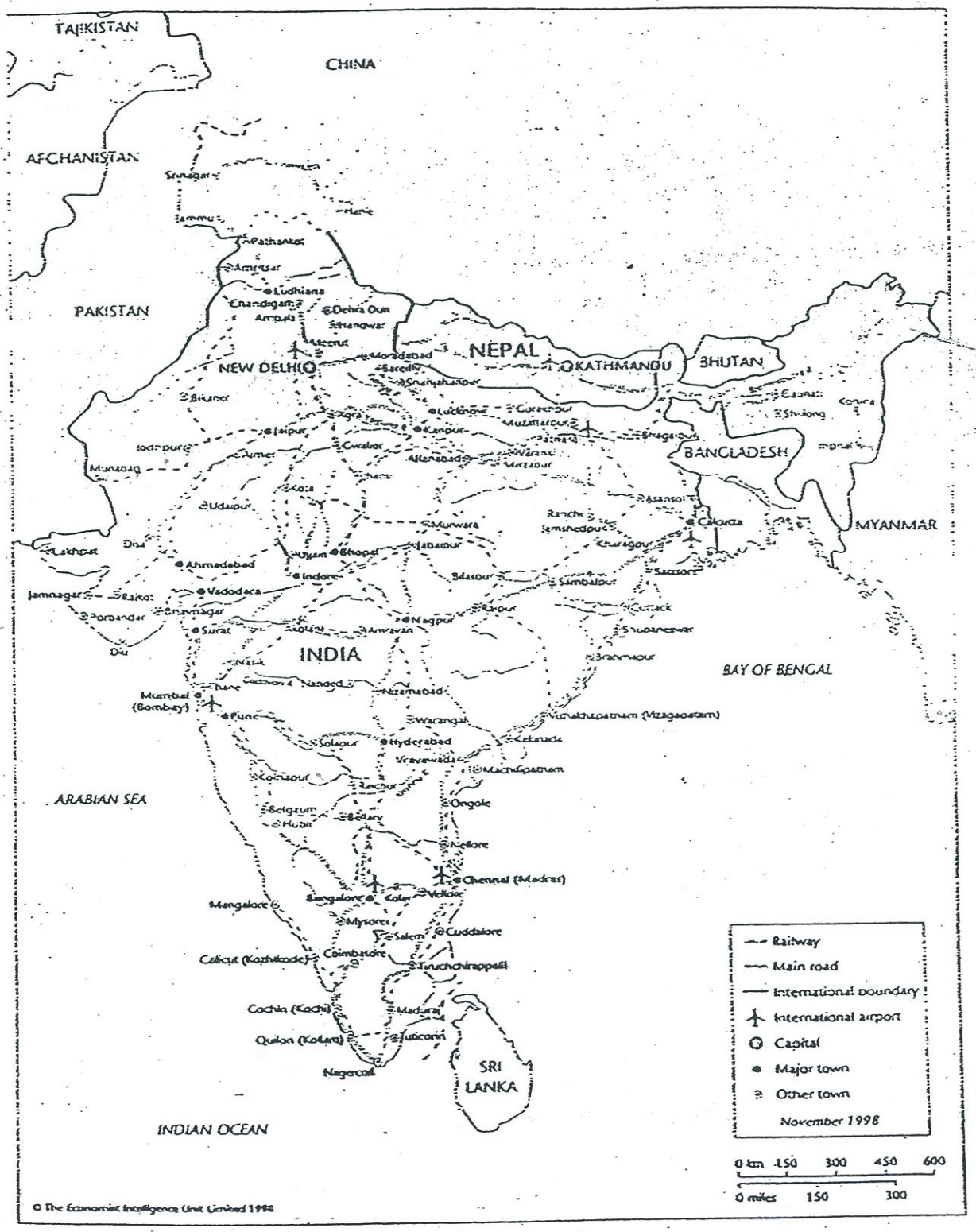


Exhibit 3 Comparable Economic Information

Indicators	1996 India	1996 UK	1996 U.S.	1991 India	1991 UK	1991 U.S.
Local currency : US$[a] (year average)	Rs35.43	£0.64	—	Rs22.74	£0.56	—
Population[a] (millions)	956.6[d]	58.8[d]	265.3	827	57.8	252.6
GDP[a] (market prices in local cur. bn)	12,619[d]	733.9[d]	7,580	5,420	575.7	5,917
Exports[a] (in local currency bn)	656.8[de]	164.0[d]	613.5[d]	413.9	102.3	416.9
Imports[a] (in local currency bn)	775.3[de]	175.6[d]	769.9[d]	461.6	112.5	491.0
GDP % real growth[a]	5.7%[d]	2.3%[d]	2.5%	5.4%	-2.0%	-1.0%
GDP % financial, bus. & other services[b]	11.1%[fh]	22.2%[f]	35.6%[gi]	10.2%[h]	24.6%	35.8%[i]
Capital Markets[c] (Jan. 31)						
Price index	172.9	183.5	192.3	100.0	100.0	100.0
Volume of shares traded (millions)	27,491	12,229	12,263	n/a	5,187	4,164
Market Value (in local currency bn)	2,584	857	5,658	736	403	2,583
Val. of volume (in local currency m)	5,552	43,613	508,923	n/a	12,309	134,425

Ratings Index (unless otherwise noted), 1995[j]

Ratings are on a scale of 0 to 10. Higher scores indicate more desirable situation.

Finance Market	India	UK	U.S.
No. of listed domestic companies (1994)	appr. 5,000[n]	2,070	7,770
No. of companies followed by at least one analyst[k]	347	n/a	n/a
No. of securities analysts (individuals)[k]	121	1,347	523,000
Ability of foreign investors to control domestic companies	6.57	9.38	8.46
Local capital markets accessible to domestic & foreign co.	5.66	8.72	8.22
Stock markets reflect real value of companies	4.32	6.35	6.91
Availability of venture capital	4.58	7.64	8.31
Adequate financial regulations	6.26	7.53	7.54
Accounting standards	5.70	7.80	7.10
Information & Infrastructure			
Urban population (%)	26.8%	89.5%	76.2%
No. of business students[l] (% of pop.)	0.1%	0.4%	0.9%
Radios per 1,000 pop.[l]	81	1,429	2,122
Phone lines in use per 1,000 pop. (1994)	9	477	576
TVs per 1,000[l] (1994)	40	439	817
Newspaper circulation per 1,000 pop. (1992)	31	383	240
Electricity generation (annual Kwh per capita, 1993)	363	5,533	11,158
Adequacy of power supply	2.76	8.40	9.00
Adequacy of roads	2.15	5.49	8.34
Adequacy of telecom infrastructure	4.00	8.26	9.09
Overall efficiency of distribution systems	5.14	7.54	8.78
Political Risk Factors[m]			
Efficiency of judicial system	8.00	10.00	10.00
Rule of law	4.17	8.57	10.00
Corruption	4.58	9.10	8.63
Risk expropriation	7.75	9.71	9.98
Risk of contract repudiation by government	6.11	9.63	9.0

Source: "Modern India," HBS No. 797-108, p. 11

[a]As reported in *Economic Intelligence Unit (EIU) Country Reports*, various countries, 1st quarter, 1997 and 4th quarter, 1996. [b]As reported in *EIU Country Profiles*, various countries, 1996-1997 and 1993-1994. [c]Datastream International, 1997. Indian data from CRISIL 500 Equity Index, Bombay, India. [d]*EIU* estimate. [e]Merchandise exports and imports only. [f]1995 data. [g]1993 data. [h]Real estate and finance only. [i]Includes real estate and insurance. [j]Unless otherwise noted, data is from *World Competitiveness Report*, 1996. [k]*US Statistical Abstract*, Table 654, 1996 (US) and *Nelson's Directory of Investment Research*, Vol. II, 1996 (UK) and 1997 (India). [l]*UNESCO Statistical Yearbook*, 1996. [m]*Law and Finance*, by Raphael La Porta, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert W. Vishny, working paper #5661, The National Bureau of Economic Research, Inc., July 1996, Table 7. The ratings are an average of the months of April and October from the *International Country Risk's* monthly index between 1982 and 1995. The "Efficiency of judicial system" rating is a 1980-1983 average of raw numbers provided by the Business International Corporation. [n]Estimates vary widely.

Exhibit 4 India's Software Exports, Domestic Sales and Imports (Rs. Billion / $ Million)

Year	Exports	Domestic Sales	Exports/ Total Sales (%)	Software Imports	Hardware Imports
1987-88	Rs. 0.70 $52	Rs. 1.00	41	-	$154
1990-91	Rs. 2.50 $128	Rs. 2.25	52	$25	$14
1991-92	Rs. 4.30 $164	Rs. 3.20	57	-	$22.5
1992-93	Rs. 6.70 $225	Rs. 4.90	57	$56	$18
1993-94	Rs. 10.20 $330	Rs. 6.95	59	$60	$33
1994-95	Rs. 15.30 $485	Rs. 10.70	59	$100	$7
1995-96	Rs. 25.20 $735	Rs. 16.70	60	$133	-
1996-97	Rs. 39.00 $1110	Rs. 25.00	61	-	-
1997-98	Rs. 65.3 $1790	Rs. 35.8	64	-	-
1998-99	Rs. 109 $2650	Rs. 49.5	68	$ 500 (estimate)	-

Sources: NASSCOM; Heeks, R. *India's Software Industry: State Policy, Liberalisation and Development*, (New Delhi: Sage Publications, 1996)

- Figures not available.

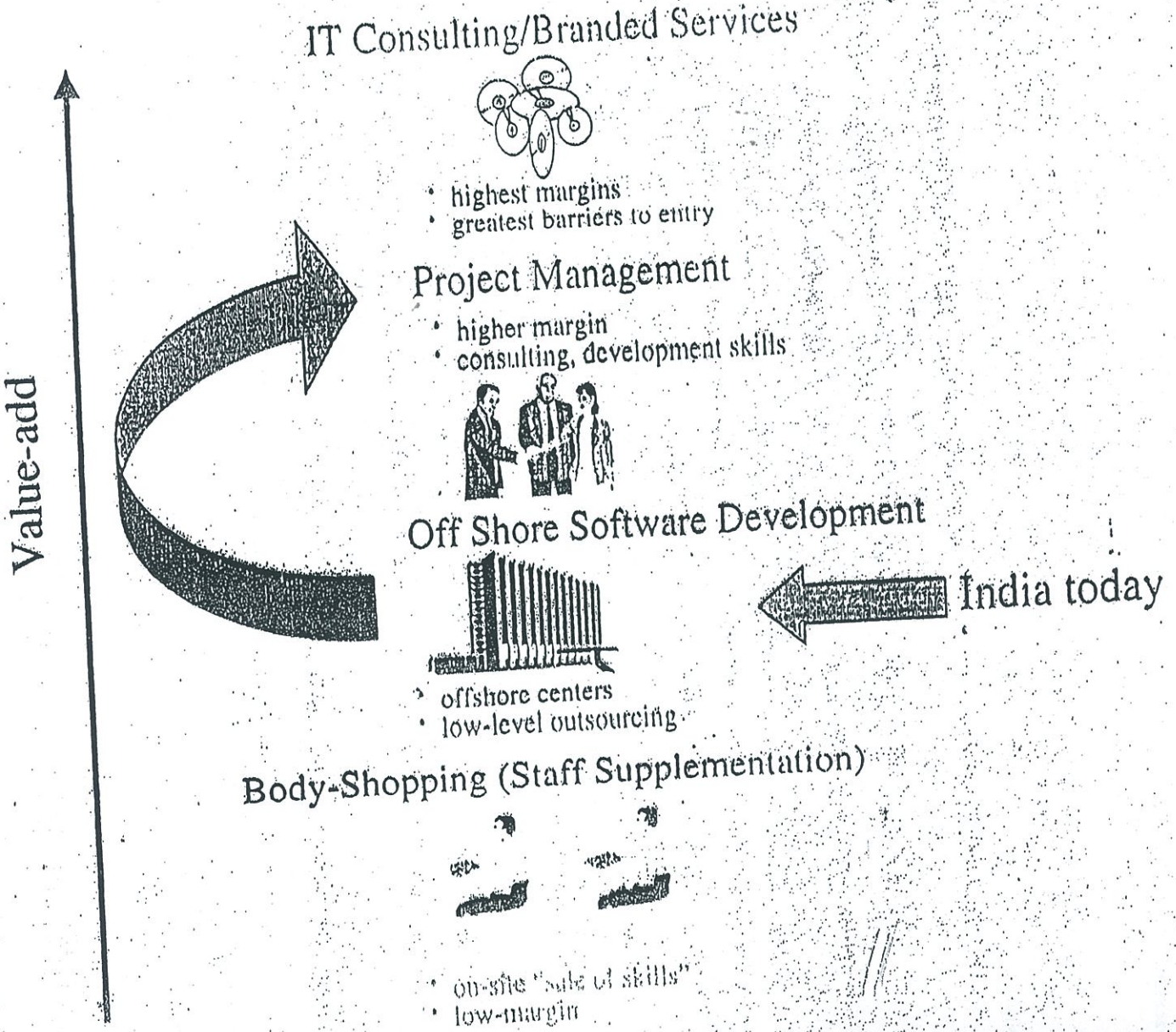
Note: The figures for the domestic software activity do not include in house development of software by end users, which is presumed to be a considerable amount.

Exhibit 5 Top 5 Indian Software Exporters

	Company	Rs. Million	Description
1	Tata Consultancy (TCS)	15,185	India's first software company and the largest software independent in Asia. Owned by the Tata industrial group. Revenues had grown at an annual rate of 40% over the past five years and were split 90:10 between exports and the domestic market.
2	Wipro	6,325	Diversified public company. Software 40% of sales; software exports 63% of operating profit. 75% of shares family controlled. CEO transformed company from sleepy manufacturer of hydrogenated oils to a leading Indian high-tech company.
3	Pentafour	5,118	Approximately 44% of revenues were accounted for by software exports, 19% by software multimedia, 4% by domestic software and 3% by training. Family controlled company that recently underwent governance changes (including divesting holdings in other family companies).
4	Infosys	5,002	Approximately 92% of its revenues were generated by software exports, with domestic software accounting for the remainder. Revenues and earnings had grown at 60%-80% rates over the past two years. Infosys was the first Indian IT services firm to achieve CMM level 4 certification. CMM level 5 certifications were relatively rare.
5	NIIT	3,949	Revenues spread across software exports (30%), software multimedia (17%, focused on educational packages), domestic software (16%), and training (37%). India's largest computer training firm. NIIT was considered part of the closely held HCL (Hindustan Computers Limited) group, which on a consolidated basis had been the largest IT group in India until overtaken by TCS in 1997-98.
	Top 5 Total	35,579	
	India's total exports	109,400	
	Share of top 5 firms	32.5%	

Sources: NASSCOM; "The Indian Software Industry at the Millennium," HBS No. 700-036.

Exhibit 6 IT Software Value-added Chain for Software Service Providers



Source: Adapted from BT Alex.Brown Incorporated

Exhibit 7 - Infosys Founders (Description of duties in January 1999)

1. *N R Narayana Murthy:* Mr. Murthy is the Chairman of the board and Chief Executive Officer of Infosys Technologies Limited. He has varied experience in developing software products, project management. He also has extensive exposure to the international business environment. He is credited with designing the first BASIC INTERPRETER for an Indian computer manufacturer. Mr. Murthy has also served as the President of the National Association of Software and Service Companies (NASSCOM). He was given the "IT Man of the Year" award for 1996 by Dataquest, India and also the prestigious JRD Tata Corporate Leadership Award in 1998. He is a Fellow of the All India Management Association and the Computer Society of India. Mr. Murthy holds a Bachelors degree in Electrical Engineering from the University of Mysore and a Masters degree from the Indian Institute of Technology (I.I.T.), Kanpur.

2. *Nandan M Nilekani:* Mr. Nilekani is the Head of the Marketing and Sales functions of Infosys Technologies Limited. Before this, he has held various positions at the company including that of 'Head of the Banking Business Unit' and 'Manager of International Marketing'. Mr. Nilekani is a co-founder of NASSCOM and has over 20 years of experience in the software industry. He holds a Bachelors degree in Electrical Engineering from IIT, Mumbai. Under the new reorganization announced in August 1998, Mr. Nilekani will assume the duties of Managing Director, President and Chief Operating Officer of the company.

3. *N S Raghavan:* Mr. Raghavan has served as a Director of Infosys Technologies Limited since 1981. He is also the head of Human Resources and Education at Infosys. Prior to this he held various senior management positions at the company. Mr. Raghavan is a veteran of the software services industry and has over 30 years of experience. Before starting Infosys in 1981, he worked at Patni Computers in India. He holds a Bachelors degree in Electrical Engineering from Andhra University.

4. *S Gopalakrishnan:* Mr. Gopalakrishnan has been the Head of Client Delivery and Technology at Infosys Technologies Limited since 1996. From 1994 to 1996, he served in the capacity of the Head of Technical Support Services at Infosys. From 1987 to 1994, he managed projects at the US based K SA/Infosys joint venture as the Technical Vice President. Before 1987, he guided the technical direction of the company as the Technical Director of Infosys. He has over 19 years of experience in the software technology industry. He holds a Masters degree in Physics and Computer Science from I.I.T. Chennai.

5. *K Dinesh:* Mr. Dinesh is the Head of Quality, Productivity and MIS at Infosys Technologies Limited. Prior to this he has held various senior project management positions at the company and was responsible for the worldwide software development efforts of the company. He is the author of DMAP, a large application package used by various distributors for inventory management. He has over 22 years of experience in the software industry and holds a Masters degree in Mathematics from Bangalore University.

6. *S D Shibulal:* Mr. Shibulal serves as the Head of Manufacturing, Distribution and Year 2000 business unit and also the Internet and Intranet business unit. Prior to that he worked on various software development projects for Infosys in the United States. From 1991 to 1996 Mr. Shibulal was on sabbatical from Infosys and served as Senior Information Resource Manager at Sun Microsystems. He holds a Masters degree in Physics from the University of Kerala and a Masters in Computer Science from Boston University.

Exhibit 8 Infosys Recent Financial Data

	Rs. in millions (except per share data, other information and ratios)					
For the Years Ended March 31,	1982	1994	1995	1996	1997	1998
Particulars						
Revenue	1.2	300.8	577.0	934.1	1,438.1	2,603.7
Operating profit (PBIDT)	-	97.1	198.6	339.5	500.6	886.1
Interest	-	0.5	-	-	6.1	-
Depreciation	-	8.1	46.0	86.3	105.2	227.5
Provision for taxation	-	7.6	19.4	43.1	52.5	55.0
Profit after tax from ordinary activities	0.4	8.1	133.2	210.1	336.8	603.6
Dividend	-	11.7	23.1	36.3	39.9	70.3
Return on average net worth (%)	96.88	39.61	29.71	29.53	34.96	42.24
Return on average capital employed (PBIT/average capital employed) (%)	96.88	43.13	31.79	33.12	40.16	46.09
As at the end of the Year						
Share capital	0.01	33.5	72.6	72.6	72.6	160.2
Reserves and surplus	0.38	253.5	552.0	725.8	1,055.8	1,569.4
Loan funds	-	-	63.4	42.6	-	-
Gross block	0.002	82.7	253.2	468.6	712.9	1,051.4
Capital investment	0.002	71.3	252.3	155.5	273.1	344.1
Net current assets	0.63	139.4	324.7	411.7	542.0	972.3
Debt—equity ratio	-	-	0.10	0.05	-	-
Market capitalization	-	2,011.0	3,488.0	3,593.0	7,310.4	29,275.0
Per share data						
Earnings from ordinary activities (Rs.)*	377.77	2.45	4.03	6.35	10.18	18.25
Dividend per share (Rs.)	-	3.50	4.50	5.00	5.50	6.00
Book value (Rs.)	383.10	9.00	19.00	24.00	34.00	52.00
Other information						
Number of shareholders	7	6,033	6,526	6,909	6,414	6,622
Credit rating from CRISIL*						
Commercial paper	-	-	"P1+"	"P1+"	"P1+"	"P1+"
Non-convertible debentures	-	-	"AA"	"AA"	"AA"	"AA"

Source: Infosys

Note: The above figures are based on Indian GAAP.

*On a fully diluted basis and adjusted for bonus issue of 1:1 during 1994-1995, 1997-1998, and 1998-1999.

*CRISIL = Credit Rating Information Services of India Limited

Exhibit 9 List of Infosys' Accomplishments

Infosys Firsts

Infosys Technologies Ltd. was:

1. The first major Indian software company to obtain immediate certification to ISO 9001, an international software quality standard.
2. The first Indian software company to conceptualize, articulate, and implement the 24-hour productive day and the Offshore Software Development Center (OSDC) concepts.
3. The first Indian company to follow the U.S. GAAP system of accounting.
4. The first Indian company to value human resources and publish the valuation with their statement of accounts.
5. The first Indian company to value its brand and publish this information with its balance sheet.
6. The first Indian company to publish all mandatory and optional disclosures.
7. The first Indian company to distribute audited quarterly reports to its investors.
8. The first Indian company to guarantee publication of audited annual balance sheets by April15 of each year. (Year end closing is March 31).
9. The first Indian company to provide audited balance sheets in soft copy format (Floppy disks and CD ROM) to investors. Infosys was also the first Indian company to make its balance sheet available on the Internet.
10. The first Indian company to offer employee stock options to all qualified employees.
11. The first Indian company to have installed 1,400 nodes in one given location.
12. The first Indian company to have 160,000 sq. ft of built up software area in one location in India.

Source: Infosys

Exhibit 10 Productivity Parameters, Indian vs. U.S. Software Companies

Indian Software Sector: Key Productivity Parameters

(US$ 000s)	DSQ Software	Infosys	NIIT	Pentafour Software	Satyam Computer	Tata Infotech	Wipro
Sales/Employee	31.551	32.014	30.037	67.366	27.775	33.081	30.270
Operating Cost/Employee	22.309	21.341	20.137	37.700	17.364	23.410	20.882
Operating Profit/Employee	9.242	10.674	9.900	29.666	10.411	4.671	9.388
PBIT/Employee	8.452	8.184	9.235	22.087	6.894	4.557	8.118
Net Profit/Employee	6.734	7.500	6.287	16.185	6.081	3.502	5.521
Capital/Employee	28.902	17.755	25.863	80.310	27.330	12.000	30.324
ROCE (%)	29.2	46.1	35.7	27.5	25.2	38.0	25.8

* Calculated based on an average exchange rate of Rs 37.2/US$ for FY1998

U.S. Software Sector: Key Productivity Parameters

(US$ 000s)	Cambridge Technology Partners	Complete Business Solutions	Computer Horizons Corp.	Information Management Resources	Keane Assoc.	Mastech Corp.	Sapient Corp.	Technology Solutions Company
Revenue/Employee	166.158	70.769	102.270	71.349	93.312	80.281	134.165	208.974
Operating Cost/Employee	139.837	63.628	89.681	54.370	79.204	69.218	103.826	177.198
Operating Profit/Employee	26.321	7.141	12.588	16.980	14.108	11.063	30.339	31.776
PBIT/Employee	23.781	6.688	12.277	14.987	11.511	10.864	29.786	28.012
Net Profit/Employee	13.454	4.289	6.918	10.157	6.552	6.393	18.349	16.157
Capital/Employee	51.597	27.023	39.193	66.575	31.893	36.686	111.335	100.535
ROCE (%)	46.1	24.7	31.3	22.5	36.1	29.6	26.7	27.9

Source: "India Software: A Comparison of India's Top Software Exporters." *Morgan Stanley Dean Witter*, August 7, 1998
Note: Cambridge Technology Partners' revenues were generated almost entirely through fixed-price contracts.

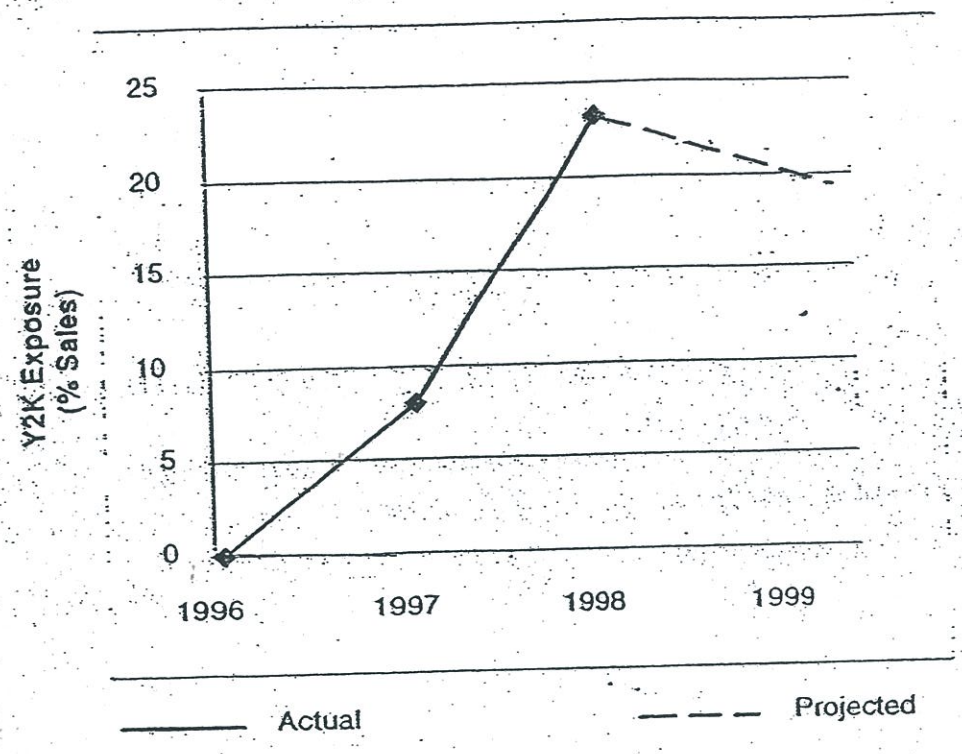
Exhibit 11 1994 Software Industry Cost Comparisons (Indexed)

Country	Programmer	Systems Analyst
USA	1164	1124
Japan	1293	1185
Germany	1351	1196
France	1135	1307
Britain	781	1287
Mexico	652	658
India	100	100
Russia	80	84
China	75	80

Sources: *The Economist* (1994); Krihsna Guha, "Software Houses," *Financial Times*, October 26, 1998; "The Indian Software Industry at the Millennium," HBS No. 700-036, p. 24.

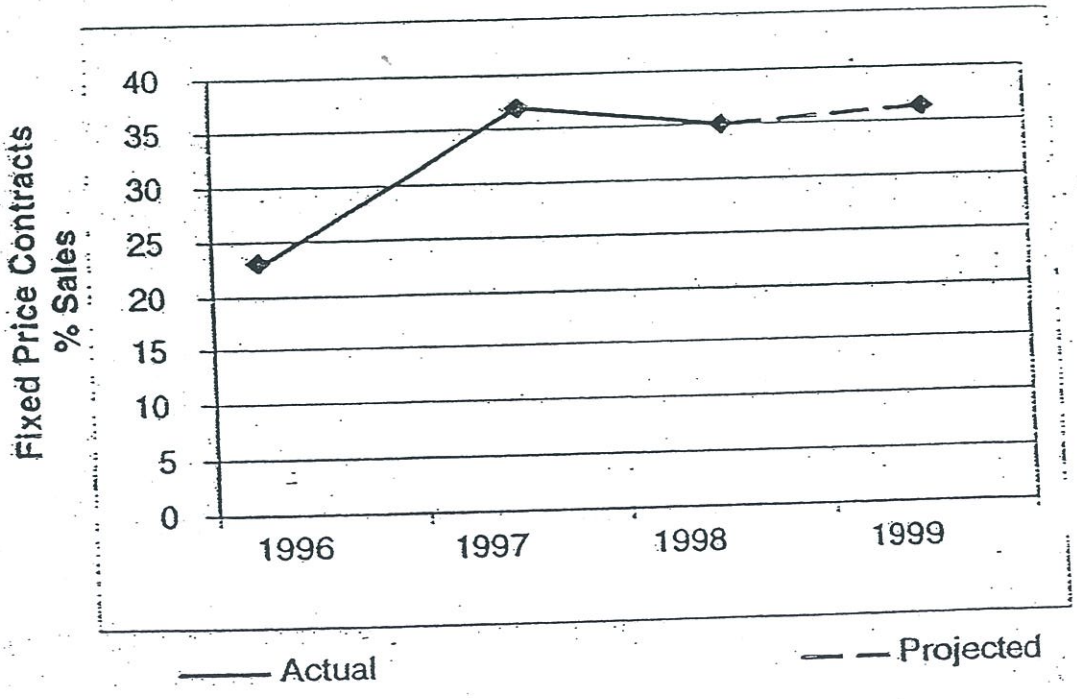
According to estimates by Jardine Fleming, it cost $3,000 per month by the end of the 1990s to outsource work to an Indian programmer, compared to about $6,000 in basic salary for a U.S. programmer, or $9,000 per month including benefits. The costs of using Indian personnel were compounded by turnover rates that had reached 25-30% per year.

Exhibit 12 Infosys Historical and Projected Y2K Exposure



Source: Infosys

Exhibit 13 Infosys Historical and Projected Fixed Price Contracts



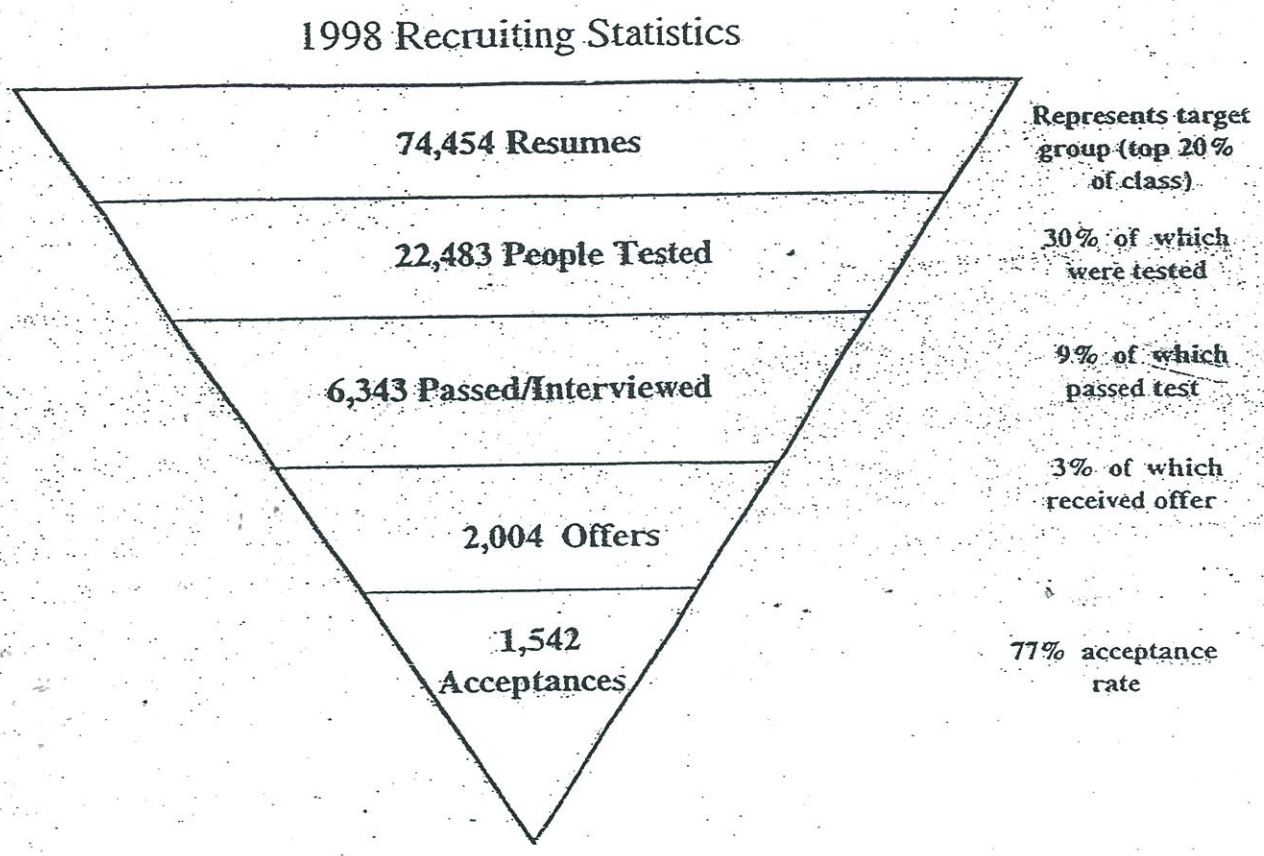
Source: Infosys

Exhibit 14 Infosys Historical Sales and Employment Figures

As of March 31,	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total Revenues											
Indian GAAP—Rs. million	27.5	25.4	41.5	55.1	94.6	145.2	300.8	577.0	934.1	1,438.1	2,603.7
U.S. GAAP—US$ million							9.5	18.1	26.6	39.6	68.3
Total employees	73	110	136	176	300	450	573	904	1,172	1,705	2,605

Source: Infosys

Exhibit 15 Infosys' Recruiting Process and Statistics



Source: Infosys; Thomas Weisel Partners

Exhibit 16 Listing Considerations

	NYSE	NASDAQ
Advantages:	• World's largest equity market • Greatest liquidity • Highly prestigious/visible • High listing standards create important perception of quality • Focus of a designated specialist • Larger institutional investor base	• Peer group: favored market for technology stocks • Low cost • Large and liquid market • Significant liquidity through market making system (multiple market makers) • Easier to fulfill listing requirements • May avoid shadow of larger companies • Exemption from providing voting rights can be obtained
Disadvantages:	• Higher listing costs • Much smaller group of comparable firms • Mandatory to provide voting rights to ADR holders	• Not as highly visible as NYSE • Less prestigious

Source: Infosys

Exhibit 17 Comparable Trading Information (Early 1999)

	Average Daily Volume	Shares Outst. (MM)	Market Cap ($MM)	Calendar EPS 1998A	Calendar EPS 1999E	Calendar EPS 2000E	Calendar P/E Ratios 1998A	Calendar P/E Ratios 1999E	Calendar P/E Ratios 2000E	LTM Revenues ($MM)	Mkt Cap/ LTM Revenues	5 Yr. Growth Rate
U.S. Domestic Consulting & Systems Integration Companies												
AnswerThink Consulting Group	253	34.7	927.4	$0.20	$0.46	$0.78	133.8x	58.2x	34.3x	103	9.0x	50%
Cambridge Technology Partners	3111	61.9	843.3	0.91	0.73	-	15.0x	18.7x	-	581	1.5x	25
Dendrite International	296	25.1	530.2	0.51	0.65	0.80	41.4x	32.5x	26.4x	113	4.7x	35
International Network Services (6)	276	41.0	2,852.5	0.56	0.91	1.28	124.1x	76.4x	54.3x	238	12.0x	50
Metzler Group	742	37.0	1,166.3	0.94	1.33	-	33.5x	23.7x	-	249	4.7x	30
Sapient	224	26.5	2,147.9	0.74	1.05	1.51	101.7x	71.7x	49.8x	160	13.4x	50
Whittman-Hart	582	55.9	1,229.8	0.37	0.52	0.72	59.5x	42.3x	30.6x	308	4.0x	35
Average:							72.7x	46.2x	39.1x		7.0x	39%
U.S. Domestic & Offshore Development Companies												
Cognizant Technology Solutions	184	9.5	245.9	$0.70	$0.98	$1.28	36.8x	26.3x	20.1x	59	2.4x	35%
Complete Business Solutions	556	36.3	655.1	0.83	1.16	1.53	21.8x	15.6x	11.8x	377	1.7x	35
Information Management Resources	543	37.7	669.5	0.73	0.95	1.20	24.3x	18.7x	14.8x	158	4.2x	44
Mastech Corp	684	49.9	616.9	0.73	1.00	1.34	17.0x	12.4x	9.2x	305	2.0x	37
Syntel	89	39.1	320.0	0.63	0.64	0.79	13.0x	12.8x	10.4x	168	1.9x	23
Average:							22.6x	17.1x	13.3x		2.8x	35%
European IT Services (These companies do not trade in the United States but do trade in European markets)												
Cap Gemini (Paris)	-	68.2	11,763	$3.86	$4.88	-	44.7x	35.4x	-	4,010	2.9x	30%
Druid (6 London)	-	22.1	539	0.52	0.64	-	46.8x	38.3x	-	67	8.1x	35
Logica (6 London)	-	278.9	2,911	0.16	0.20	-	67.3x	51.3x	-	777	3.7x	25
SEMA Group (London)	-	459.5	5,127	0.20	0.23	-	57.2x	48.0x	-	1,941	2.6x	25
Average:							54.0x	43.2x			4.4x	29%
Infosys Technologies Limited (3)*	-	16.0	1,213.0	$0.96	$2.31	$4.17	79.2x	32.8x	18.2x	106	11.4x	35%

Source: AT Financial, First Call, Zack's company reports, BancBoston Robertson Stephen's estimates, and CS First Boston estimates

*Infosys data as of January 11, 1999 as quoted on the Bombay Stock Exchange.

Note: Numbers in parentheses following company name indicate month of fiscal year if other than December.

Exhibit 18 Earnings Forecast

Income Statement—Year end March 31 (US$ millions)

	1996	1997	1998	1999F	2000F	2001F
Net revenues	26.61	39.59	68.33	120.82	178.16	266.59
Total revenues	26.61	39.59	68.33	120.82	178.16	266.59
Expenses						
Cost of sales	15.64	22.62	40.16	64.58	93.76	145.67
SG&A	4.35	7.38	13.23	18.66	28.41	40.43
Deferred stock compensation*	0.36	0.77	2.57	16.60	5.84	6.00
Total operating expenses	20.35	30.77	55.95	99.84	128.01	192.10
Operating income	6.26	8.82	12.38	20.98	50.15	74.49
Nonoperating income	1.46	1.32	0.80	1.71	4.00	5.20
Interest expenses	-	0.17	-	-	-	-
Pre-tax income	7.72	9.96	13.18	22.70	54.15	79.69
Taxes	0.89	1.32	0.77	5.13	7.58	11.16
Subsidiary preferred stock dividends	-	-	-	0.20	-	-
Net income	6.82	8.64	12.41	17.36	46.57	68.54
Net income ex-deferred stock comp.	7.18	9.41	14.98	33.97	52.41	74.54
Weighted shares (basic)	29.03	29.04	30.53	31.10	33.32	33.74
Weighted shares (diluted)	29.28	29.70	31.33	31.47	34.08	34.51
Basic EPS	0.24	0.30	0.41	0.56	1.40	2.03
Diluted EPS	0.23	0.29	0.40	0.55	1.37	1.99
CSFB EPS	0.25	0.32	0.48	1.08	1.54	2.16
Head Count						
Software professionals	957	1,396	2,182	3,132	4,432	5,932
Others	215	312	440	521	631	706
Total	1,172	1,708	2,622	3,653	5,063	6,638
Revenue/software professional	31,358	33,647	38,195	43,468	47,291	51,383
Revenue/employee	25,645	27,490	31,561	38,511	40,882	45,565

Cash Flow Statement—Year end March 31 (US$ millions)

	1997	1998	1999F	2000F	2001F
Cash flow from operating activities					
Profit after tax	8.64	12.41	17.36	46.57	68.54
Change in working capital		(2.29)	(9.77)	(7.68)	(12.37)
Net cash from operations	9.73	16.25	17.79	53.14	77.49
Cash flow from investing					
Investment in fixed assets	-7.27	(8.44)	(23.17)	(26.47)	(37.51)
Net cash from investing	(7.35)	(8.44)	(23.17)	(26.47)	(37.51)
Cash flow from financing					
Issue of common stock	0.46	2.02	70.38		
Issue of preferred stock	0.00	2.32			
Preferred dividend		(0.07)			
Long-term loan	-1.25	-	-	-	-
Dividends paid	-1.06	(1.47)	(3.40)	(5.24)	(7.45)
Net cash from financing	(1.85)	2.80	66.98	(5.24)	(7.45)
Currency translation effect	-1.90	(3.51)			
Net increase in cash & cash equivalents	0.52	7.10	61.60	21.43	32.52

Source: CSFB

*Under U.S. GAAP, expense recognized for the difference between exercise price and market price on date of option grant, amortized over vesting period.

Exhibit 19a Market Information

Infosys Beta	1.20
Beta for U.S. software companies	1.46
Beta for all Indian software companies versus Bombay Stock Exchange	0.73
U.S. equity risk premium	7.0%
Indian equity risk premium	10.0%
30 year U.S. treasury bond	5.15%
Indian bonds:	
Indian government long bond (local currency)	12.15%
AAA corporate bonds (U.S.$ denominated)	8.50%

Exhibit 19b Individual Betas for Some Indian Software Companies (versus Bombay Stock Exchange)

Infosys	0.92
Aptech	0.85
NIIT	0.96
Pentafour	1.27
Satyam Comp.	1.13
Wipro	0.95

Source: CSFB Research, MorganStanleyDeanWitter, Infosys

Exhibit 20 Analysts' Estimates Versus Actual Performance

	Fiscal Year 1997*			Fiscal Year 1998*			Fiscal Year 1999*		
	Est.	Actuals	% Δ	Est.	Actuals	% Δ	Est.	Actuals*	% Δ
Net Income (Rs in MM)	306.0	336.8	10.1%	469.6	603.6	28.5%	870.0	1,352.6	55.5%
EPS (Rs.)	41.1	46.4	12.9%	31.0	37.7	21.6%	27.5	40.2	46.2%

Source: First Call , company financials, and Thomas Weisel Partners.

*FY 1997 estimates reflect analysts' consensus in October 1996. EPS estimate and actual number is not adjusted for stock split.

*FY 1998 estimates reflect analysts' consensus in April 1997.

*FY 1999 estimates reflect analysts' consensus in April 1998.

*FY 1999 actuals reflect TWP estimates, exclude non-recurring compensation charges and are converted into rupees.