



Infosys Technologies Limited (A)

"We will be a globally respected corporation that provides best-of-breed software solutions delivered by best-in-class people"

- N.R. Narayana Murthy
Chairman and CEO
at a speech inaugurating the new
corporate headquarters in 1994

"Infosys maintains pace, posts 91% jump in total income! - The darling of the Indian stock markets, Infosys Technologies, has kept up its scorching pace. For the third quarter ended December 31, 1998, it registered a 91% growth in total income and 107% increase in net profit....."¹ N.R. Narayana Murthy, Chief Executive Officer of Infosys Technologies Limited (ITL) stared at the Economic Times article again. It was 6:30 AM on Wednesday January 13, 1999, and the announcement of Infosys' quarterly results the previous evening had sparked a series of similar articles in all the leading newspapers of India. By any standard, Murthy should have been very proud of what he and his team had achieved since starting Infosys in 1981 with Rupees (Rs.) 10,000 of capital (1 US\$ = Rs. 8.27 in March 1981). Since the company had gone public in 1993, its stock price had appreciated 17,678 percent and continued to increase. In fact, the Economic Times carried another article in the same issue entitled "How to be a millionaire!"² (See Exhibit 1), which showed that a Rs. 10,000 investment in Infosys in 1993 was worth Rs. 1.47 million five years later.

Murthy sat quietly in his office and listened to the buzz of the company coming alive around him. He had always been an early riser and had a reputation of working twelve to fourteen hour days every week. The early morning hours were the best, as they allowed him to act on all the issues he had thought of since leaving the office the previous evening. Today, he

MBA student Bhairav Trivedi prepared this case under the supervision of Professor Jitendra Singh as part of a research project. It is intended to be the basis of classroom discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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reflected again on some of the issues that had preoccupied him in the last several months. How could Infosys continue to maintain and even increase the "scorching" pace it had created? Even more important, as the new millennium approached, what additional steps did it need to take to ensure that it would become a premium world-class company, one that was viewed as a leader in the information technology arena. With its Q3, 1998 revenues going above target, ITL was expected to easily exceed its projected revenues of Rs. 4,000 million (10 million=1 crore) but it still had much to do organizationally to become the global company that Murthy envisioned (see Exhibit 2 for audited financial statements.)

Three main issues highlighted the current focus of Infosys' globalization program. The first required Infosys to achieve a listing on the NASDAQ stock exchange with an American Depository Receipt (ADR) offering. The company had almost launched its ADR in November 1998, but then withdrew this effort when the US markets were affected by the Asian debacle in the middle of 1998³. An ADR would allow ITL to become the first Indian company listed on the NASDAQ stock exchange and would be a step toward being recognized as a global player in the software services industry.⁴

The second required ITL to change organizationally from being a domestic company headquartered in India and providing services to a host of clients spread out across the globe to being a global company delivering local solutions to all of its clients. This goal would require Infosys to set up development centers and local offices in major countries where its clients existed and providing solutions locally to each of its regional markets.

Finally, in order to spearhead these efforts, Murthy felt that the management team at ITL would have to change to concentrate exclusively on globalization. To that end, ITL had announced in August 1998 that Murthy would step down from his job as President in April 1999 and focus almost exclusively on building ITL into a global software services company. Nandan Nilekani, a co-founder of Infosys, was named the next President of the company and would focus on operational issues.⁵

Murthy felt that the foundation for change had been set. Now, only time would tell how the company fared in its quest to become the first truly global software solutions company headquartered in India. He reminisced briefly on how ITL had transformed itself from its humble beginning in 1981 to become a company with one of the largest market capitalizations in India at over Rs. 47,603 million. His goal in 1981 had been to run a company that created wealth for all of its stakeholders. No one could argue that in a few short years, ITL had accomplished this objective many times over. Of its approximately 3,500 employees, ITL had created almost 1000 Rupee millionaires and 40-dollar millionaires! The ringing of the telephone broke Murthy's thoughts. His secretary informed him that his 7 AM meeting was on schedule. Much remained to be done. Another day had begun....

Infosys Technologies - the early years.

On July 2, 1981, seven engineers working for Patni Computers, an Indian re-seller of US-based Data General machines, decided to start their own company. Thus Infosys Technologies was born. (One of them, Ashok Arora, left in 1989 to join a US-based software company.) The six remaining engineers, all from middle-class backgrounds in India, had relatively little experience but desired to succeed in what they did and make something of their lives. (See Exhibit 3 for a list of the founders and their backgrounds.) The total capital the founders scraped together was just Rs.10,000.

From its start in 1981, Infosys relied on overseas business, giving it a global perspective that many other Indian companies lacked. Murthy stayed in India and tried to generate business and manage the corporate office and administrative issues, while the other founders journeyed to the United States, staying for months at a time to perform on-site programming for corporate clients. They shared cheap apartments and did everything possible to keep their costs low. Among the takers for the company's low-cost, high quality customized software solutions was sport-shoe maker Reebok International Ltd. . . Today, the company has over 100 diversified clients across IT markets in the United States and Europe (see Exhibit 4 for a list of key clients in each of the markets that Infosys serves.)

In 1982, the company hired its first employees – three young engineers from the Indian Institute of Technology, Chennai (formerly known as Madras.) “We had very little to offer our first employees and so attracting talent was extremely difficult,” Murthy recalls, “All I could promise them were tremendous opportunities to grow and learn and a work environment that would never be lacking challenge!” “They were really surprised when they showed up the first day for work and discovered that the office, which they all three shared with me, was a converted bedroom in my little apartment,” he now recalls.⁶ Infosys trained each of its early employees at its offices in India and then dispatched them to work at client sites in the States.

Gradually, the company's revenues started increasing, allowing it to invest in resources for training and product development. In those days, the Indian economy was closed to outside investment and the policy context was heavily bureaucratic. For a relatively simple task like importing a computer (no computers were manufactured domestically), a company both had to demonstrate that it was generating significant revenues in foreign exchange and apply for an import license. These licenses took many months to approve, and it was not uncommon for companies to maintain a staff of personnel to negotiate with government offices for approval of their licenses. Although all of its revenues came from foreign markets, Infosys had neither the capacity to incur the cost of purchasing and maintaining its own computer in India nor the space to house such a computer. Its solution to this dilemma was one that is characteristic of its founders' ingenuity in making do with scarce resources. It purchased the computer and had it installed on the premises of a major customer in India. It then bartered its technical knowledge

for computer time and at the same time used the computer to train new employees and develop products. Thus, it realized revenues and gained a valuable tool for training while addressing the costs of maintenance and storage.

The company transformed from a capital-starved operation offering on-site services to foreign customers into a provider of turnkey software development and maintenance. “On-site services were a step in confidence building with our customers. Most of them did not know of our capability and we had to make them feel comfortable with our model before moving our software development offshore to India. We also focused on acquiring domain knowledge in key vertical segments such as retail, distribution, finance, and telecommunication,” explains Murthy⁷. By setting up software factories in India for its growing client base, Infosys could take advantage of lower costs and economies of scale, as well as implement processes and systems that would allow it to gain a strategic advantage for future customers.

While working for a client in late 1985, Infosys came in contact with Kurt Salmon and Associates (KSA), a management-consulting firm located in Atlanta, Georgia. Infosys explored the possibility of a partnership with KSA to expand its marketing effort in the United States. KSA suggested a joint venture, which would allow it to manage quality control and continuity. (In the beginning, KSA and Infosys were 60/40 partners but Infosys increased its share to a 50% stake in 1993. The name of the new company was changed to Software Sourcing Corporation to better reflect its charter.) KSA was responsible for sourcing projects for the joint venture and Infosys provided the software expertise and technical knowledge. KSA/Infosys was formed in 1987 with offices in Atlanta, which were responsible for soliciting software projects while the Infosys offices in India provided the personnel. In 1990, the company achieved sales of \$3.24 million with a profit of \$553,000. “At that time, this joint venture allowed us to build credibility in a market where we were relative newcomers and gave us access to a number of opportunities we would not have otherwise had,” recalled S. Gopalakrishnan, who was responsible for managing the relationship with KSA.⁸ This joint venture was terminated in 1995 when Infosys started a marketing office in the States and marketed its products based on its own brand name. Infosys also won a large project with Reebok of France after investing significantly to prepare for the bid. The 20-person year project involved designing and building an automated ordering and distribution system that would track and maintain Reebok orders worldwide. The project team overcame many hurdles, including the language barrier (many of the project specifications were provided in French) and completed the project ahead of time, which won it accolades and a new customer for life. Infosys gradually gained acceptance and came to be recognized as a quality provider of application services and, by 1993, it worked on projects for GE, Nestle, Holiday Inn, and many other firms.

1989 was a watershed year for the company. Late that year, all the founders gathered to evaluate whether their efforts were going in the right direction. “The company was eight years old and we felt it was time to see if the company we had created was aligned to our long-term

objectives,” says Murthy. N.S. Raghavan, one of the co-founders, recalls, “Murthy spoke to all of us and asked us if we felt comfortable with the company we had built and whether we were committed to the strategic vision of our company.”

Revenues had continued to grow steadily (see Exhibit 5 for revenues from 1982 to 1993), but the co-founders felt that they were spending too much time working in locations far from home. The company employed fewer than 50 people and Murthy felt it was a good time for the founders to decide if the firm’s business model was adequate for making the company a major power in the software industry or whether they should disband the operation. “There were many constraints to allowing us to grow in the manner we wanted to and prime among these was severe restrictions imposed by the government on foreign trade and acquisition of leading edge technology! It took nine months to get a simple import license,” says Murthy⁹. All of the partners debated, and reached the conclusion that they should dissolve the company. “Murthy allowed us to express our opinions and frustrations and stayed silent throughout the debate,” recalls Nilekani. “When we had finished and decided, he spoke for the first time.” Murthy offered to buy out each of his partners and reaffirmed that he had absolute confidence in Infosys’ ability to overcome the hurdles facing it and promised to take the company public within five years if they all stuck it out with him. All of them agreed, and Infosys Technologies survived its first and only major organizational shakeout. “We had supreme confidence in Murthy’s capabilities”, recalls K. Dinesh, “Just to know that he felt we could grow rapidly and go public within five years was enough for us. There was never any hesitation on our part in agreeing to continue.”

By 1992, due to watershed economic reforms (see *India – A source for Software Services* beginning on page 11) instituted by India’s Government in 1991, the company had turned around and reaped record revenues of just under Rs. 100 million.

N. R. Narayana Murthy: The Founder

Narayana Murthy was one of eight children born to a physics teacher in Southern India. Hailing from an average middle-class family, he chose to study electrical engineering and completed a Masters degree in 1969. After his studies, he worked in the computer department of the Indian Institute of Management, Ahmedabad, a renowned business school in Asia, before moving to Paris in 1971 to take up a job with SESA, a French company. In 1974, at the age of 26, confident that he had gained a lot of insight into the world around him, he decided to return to India. Armed with a backpack, Murthy, who considered himself a staunch Leftist, made his way back over land to India, determined to visit all the Communist countries *en route*. “I used to be a leftist in those days, the halcyon days of socialism, the glory days of the Soviet Union” recalls Murthy. “For those of us from developing countries, the fact that America refused to build a steel

plant in India while the Soviet Union did, made us glorify socialism. And the primary tenet of socialism was that wealth should be distributed among all members of society.”¹⁰

While in Paris, Murthy saw what prosperity capitalist Europe enjoyed. This experience planted the first seeds of doubt in his mind. “I realized that even the worst communists believe that you have to work hard, there’s a role for the private sector, and that the only solution to create wealth was to encourage more and more people to create wealth rather than redistribute poverty.”¹¹ While traveling through Bulgaria, his belief in communism received a further blow when he was arrested on a train and thrown into a jail cell for talking to a fellow passenger about capitalist ideas. After three days without food or water, he was suddenly released, with his passport returned to him, and he was asked to leave the country. The reason for this ‘compassionate treatment’, he was informed, was that India was considered a ‘friendly’ country. “That was the last straw,” recalls Murthy, “my experiences had shaken my faith in communism and I was determined to someday create a venture that embodied the best principles of capitalism and socialism – by creating wealth for all its constituents.”¹²

Murthy still stands by the principles that guided him when he helped found Infosys. He set three major principles that are still adhered to today at Infosys. First, the company is primarily transaction-based and not personality driven. Thus, its management focuses on bringing about the best for the company regardless of individual personality issues. Second, the company is focused on the long term, as is reflected in its management compensation and planning. Goals and objectives are set for the long haul. Finally, there is no blurring of the boundary between corporate and personal resources. All employees are urged to be cost conscious, and productivity (net income per employee currently stands at over \$55,000) and quality have always been the guiding principles for employees.

Murthy is known to be a visionary leader who motivates his employees and leads by example. He is frugal, and although his net worth (he owns over 7.6% of Infosys) stands at over Rs. 3,600 million, he still resides in a three-bedroom first floor house in a middle class suburb of Bangalore that he purchased many years ago. To outsiders, he is known as a leader in the technology arena who is able to identify opportunities and capitalize on them. Murthy is credited with establishing a culture at the company that is so unique that Infosys is regarded by graduates of premier engineering and management institutes in India as one of the best places to work.

The Global Information Technology Industry¹³

The Information Technology (IT) industry, which comprises hardware, software, and related services, is relatively young. It started in 1946 when the first electronic computer, the ENIAC, was created at the Moore School of Engineering at the University of Pennsylvania in Philadelphia. The first computers were extremely bulky and often filled entire rooms with wiring and parts. The invention of the transistor in 1948, the integrated circuit in 1958, and the

microprocessor in the early 1970's helped spur the industry's annual sales to over \$55 billion by 1980. The introduction of the personal computer in the late 70's further accelerated industry growth, and many new companies were born as offshoots of "Big Blue", as industry insiders knew IBM. Notable among these were Microsoft, Apple Computer, Sun Microsystems, and Oracle Corporation. By 1992, worldwide annual industry revenues had grown to over \$360 billion, making it the world's largest single industry.

IT markets were heavily concentrated in the developed countries. In 1990, the top six countries accounted for close to 80% of all IT spending, with the US accounting for almost 35% of the market, followed by Japan (19%) and Germany (8%). The US market was growing at about 7% per year and markets in other countries were growing at least as fast, with Japan and Germany experiencing growth of 13% and 10%, respectively. By 1995, these six countries still accounted for over 75% of all IT spending, but other countries in Europe had started to increase IT-related spending.

Hardware accounted for about 50% of worldwide IT revenues in 1990, but its share had started to slide due to advancements in the development of microprocessors. Worldwide hardware shipments rose 8.7% from \$437.5 billion in 1996 to an estimated \$475.5 billion in 1997. The North American market, comprising the United States, Canada, and Mexico, ranked first among the worldwide computer equipment market areas and accounted for 44.7% of the total in 1997. The European market, which includes the Western European countries, was second largest, representing 35.6% of worldwide shipments, while Asia accounted for about 17.0% of the total worldwide computer shipments¹⁴. By 1998, the average price of a PC had slid to about \$1,000, and a host of computers were available in the "sub-1000" market with an increasing number also available for under \$600¹⁵. By 1998, hardware accounted for about 35% of all IT spending and customers were spending more to obtain quality software and services.

Software and Services

From 1990 onward, software and services was the most dynamic segment of the IT industry, with a CAGR of 15%. In contrast, the CAGR for hardware had sunk to about 6%. Software and services was also the most profitable segment of the industry, with an average return on sales of over 10% for packaged software and 7% for professional services¹⁶. On the other hand, the margin for hardware producers was close to zero. The software and services segment of the IT industry could be broadly classified into the following three categories.

Packaged Software represented commercially available off-the-shelf software like operating systems, word processors, spreadsheets, databases, presentation graphics, financial/tax software, entertainment programs, home education, and desktop publishing programs. Leaders in this segment were manufacturers of large-scale proprietary systems like IBM (IBM was one of the few companies that was a leader in both the hardware and software

segments), Fujitsu, Siemens Nixdorf, and numerous “independent” software vendors like Microsoft, Lotus, Computer Associates, Novell, Borland, Autodesk, and Oracle. In 1990, packaged software accounted for roughly 15% of the market, but its share had grown closer to 20% by 1998.

Professional Services represented software consulting, custom programming, systems integration, data processing, and facilities management. Leaders in this segment were IBM, Electronic Data Systems (EDS), Computer Sciences Corporation (CSC), members of the “big six” accounting firms such as Andersen Consulting and KPMG, CAP Gemini, Digital, and Unisys. By 1998, professional services accounted for over 30% of the market. This increase was fueled largely by the discovery of the “Y2K” bug in software programs and the need to design custom solutions to ensure that major computer systems did not “crash” or lose all their data on January 1, 2000.¹⁷

Operations and Back-office Services represented maintenance and back office work such as document conversion, data entry, claims processing, and medical transcription. This segment’s share of industry revenues had declined steadily from 14% of the market in 1990 to only 7% by 1998, with increasing automation and off-the-shelf programs becoming more sophisticated in handling these tasks.

The strong growth in software services was fueled by increases in the use of computers. With the advent of the PC, there was an increasing demand for software applications that could automate a number of tasks. In the early 90’s, the Internet allowed people access to a host of facilities from their homes. By 1998, electronic commerce had propagated further growth in the industry and created a new and renewed requirement for software services, especially contract programming, to set up, operate, and maintain web pages that sold a host of products and services. In addition, as more individuals transacted over the Internet, there was an increasing need for companies to develop secure online systems that could process payments over the Internet without compromising the security of these transactions.

The Professional Services Industry

The beginnings of the professional services industry could be tracked back to the mid-60s when people like Ross Perot saw the need for providing data processing services. Because early computers were very expensive, companies found that it was more economical to contract out their computer work to a service provider like Electronic Data Systems (EDS), which owned the computer and used it for many different clients in an efficient way. These services were known as *data processing services*. Other companies opted to buy the hardware, but contracted out the maintenance and operations. This was called *facilities management*. Soon, with computers steadily dropping in price, more and more data processing was done internally.

In the 1980s, two trends created the need for increased services, albeit in different areas. First, the appetite for specialized software applications grew beyond most manufacturers' ability to provide them and most users' ability to generate them internally. Companies started to require *custom software development* services. Second, the proliferation of computer types in terms of processing power, size, and standards resulted in the need for someone to integrate all these machines through networks so that all the computing power of an enterprise could reliably work together. This was systems *design and integration*. Companies providing data processing services branched off into these areas because of their familiarity with the technology and access to the customers. At the same time, smaller companies specializing in one area or the other mushroomed. These companies also provided *training and documentation* services to enable customers to use their software, and in some cases third party or packaged software.

In the late 80s, yet another niche emerged as computer systems became more complex. Due to the proliferation of software applications and the potential they had to become key sources of competitive advantage, companies began to spend significant sums on hardware and software. It was estimated that the average budget for computing resources was 5% of the total corporate budget of companies. Further, it became increasingly necessary to plan and manage the purchase of packaged software and development of custom software. *Software consulting* began to emerge as a distinct area of professional services that provided this specialized knowledge for planning and management.

In the early 90s, the revenue breakdown in professional services was as follows: custom software development (40%), facilities management (25%), software consulting (13%), system design (10%), and training/documentation (9%). Dataquest, a leading Indian technology research organization and trade journal for the IT industry, estimated that the worldwide market for IT consulting, development, integration, and outsourcing would increase to \$291 billion by 2001, as businesses concentrated on their core competencies and attempted to minimize the size of their internal IT departments. (Exhibit 6 lists the demand for software services by geographic region from 1980 to 1997.)

Increase in Outsourcing

All along, the various functions described above had also been done inside many end-user companies. As technology cycles shortened and the complexity of computer systems grew, more and more companies subcontracted their systems to outside companies. Outsourcing thus became a distinct phenomenon, and many firms began using it in the late 80s and early 90s. Many reasons were cited for this trend:

1. Worsening backlog (two years of backlog was not unusual) because the demand for software applications was growing at a substantially greater rate than was programmer productivity.

2. Many firms had insufficient resources to create and maintain the diversity of skills needed for designing, installing, and integrating increasingly diverse and sophisticated hardware and software applications. Programmers and analysts preferred to work for computer services companies, which offered them better on-going education programs that enabled them to remain on the leading edge of technology.
3. Some developing countries and off shore locations had a significant cost advantage over developed countries, allowing companies that outsourced to take advantage of significant cost savings. Countries like India, China, the Philippines, and Mexico had talented pools of programmers who worked for a fraction of the cost of similar programmers in the US and Japan.¹⁸
4. The technological capabilities of the telecom industry improved in the early 90s. Bandwidths were now increasingly available for data transmission, and this improvement in infrastructure made transmission of software over communication lines reliable.

Coinciding with this significant increase in demand for IT services, the supply of qualified IT professionals had decreased in most developed countries, particularly in the United States, Western Europe, and Japan. According to the United States Department of Education, the number of bachelor degrees awarded in computer science annually at US universities fell from 41,889 in 1986 to 24,404 in 1995. This decrease created a growing shortage of IT professionals in the market; the Information Technology association of America reported that at US companies with more than 100 employees, the number of unfilled positions for IT professionals was 346,000 in January 1998. Furthermore, the US Department of Commerce estimated that between 1994 and 2005, US companies would require more than one million IT professionals to fill newly created positions and replace retiring workers¹⁹. By outsourcing software development and maintenance projects to offshore IT service providers, companies were able to gain access to skilled IT professionals, often in lower cost environments with a large population of English-speaking technical talent.

India – A source for software services

In 1991, the Government of India announced a number of measures to address the economic and financial difficulties the country had been facing. The package contained policies that were aimed at stimulating investment in infrastructure industries and included favorable incentives designed to foster the growing Indian software industry. Although political instability caused India's government to change five times between 1991 and 1998, each government during this time was committed to aiding the software sector. For example, in May 1998 the Indian government established the National Task Force on Information Technology, which had a mandate to make recommendations designed to detail policies to increase India's IT exports. In addition, software firms benefited from a variety of incentives, including relief from import duties

on hardware; a tax deduction for income derived from software exports, and tax holidays and infrastructure support for companies operating in Software Technology Parks. These policies had helped the Indian software industry enjoy a compound annual growth rate of almost 52 percent from 1992 to 1998.²⁰ Murthy stated in an interview with Business Week magazine in June 1998 that a lot of these factors were responsible for Infosys' meteoric rise in revenues. "We were very, very, lucky," he says. "But then chance favors the prepared mind and we were preparing ourselves for this day for a long time, almost 11 years, and when it happened, we seized it with both hands."

A survey of US software companies conducted by the World Bank in 1997 revealed that India was the leading offshore destination for companies seeking to outsource software development or IT projects. The National Association of Software and Service Companies (NASSCOM) in India estimated that India's export revenue from software including software services was approximately Rs. 64 billion in 1997-1998 and will reach Rs. 365 billion by 2001. Combined with India's domestic software requirements, it is estimated that the size of this industry in India by 2001 will be close to Rs. 565 billion. Of the Indian software export market, the US accounted for close to 58% of business, and Europe accounted for 21%.²¹ The Indian software industry had shifted its focus to a greater emphasis on application software development, which was one of the fastest growing sectors of the software industry (see Exhibit 7 for details of India's software industry.) A 1998 survey by Business Today, a leading Indian business magazine, showed that India's software export market grew over 50% between 1997-98 and 1998-99.

Although there is no doubt that economic liberalization in India played a key role in making India a premier source for software services, two other factors were also important. The first is the expertise of a large, highly skilled labor pool that is available for a relatively low cost. With over four million engineers, India ranks second only to the United States as the country with the largest population of English-speaking technical personnel. NASSCOM estimates the number of software professionals employed by Indian companies has grown from approximately 56,000 in 1990 to just over 200,000 in 1998. In addition, India has over 1,800 engineering colleges, which annually train an estimated 68,000 graduates in IT. According to Software Productivity Research, a research organization concentrating on the software industry, the average annual wage for software professionals in India is about 15% the average rate in the US, and although the Indian wages are rising at a faster rate than those in the US, the differential is anticipated to be a source of competitive advantage for many years to come.

The second key factor is the capability of Indian firms to deliver products that consistently satisfy the requirements of clients that have high quality standards. A NASSCOM analysis of international quality standards of the top 300 Indian software companies showed that 109 had already acquired ISO 900 or SEI certification, with an additional 167 anticipated to acquire this

certification by the end of 2000.²² In fact, Motorola India Electronics Pvt. Ltd. and Wipro Infotech Group were two Indian companies among a handful worldwide to have achieved Level 5 certification of the Capability Maturity Model (CMM) of the Software Engineering Institute at Carnegie Mellon University, a standard that certifies the software development processes within an organization.²³ These capabilities led to companies worldwide recognizing India's IT talent and using it to outsource their software development to Indian companies. India's government had poured significant capital into developing resources for telephone and data communications, and with the availability of satellite links for data communication, the conventional hindrances that had restrained the development of this sector in the early 90s were virtually non-existent by 1998. For US firms, the added advantage of a 9.5 –12.5 hour time differential between India (Indian Standard Time is +5.5, i.e., five and a half hours ahead of GMT) and the US allowed work to be carried out by Indian teams on a 24-hour basis, shortening cycle times and improving productivity and service quality.

By 1999, there were more than 626 companies in India engaged in the business of software exports. Of these companies, more than 73 had export revenues in excess of Rs. 100 million, as compared to only 5 companies a few years earlier. 41 companies had exports in excess of Rs. 500 million in 1997-98, indicating the high proliferation and all-around growth of software exports.²⁴ The major software companies in India were Tata Infotech, WIPRO, Satyam, NIIT, Tata Consultancy Services, Infosys, and Mastek. The top twenty companies accounted for over 61% of total software exports (see Exhibit 8 for a list of these companies.) Most of the top six companies, except for ITL, concentrated on areas of specialization within the products and services they offered. The largest of these companies, Tata Consultancy Services, operated almost exclusively by providing on-site services to customers across the world, while most of the others had a mix of on-site and offshore development in their business models.

Infosys – From 1993 to the present.

In February 1993, Infosys conducted an IPO on the Indian stock exchange with its issue priced at Rs. 95 per share. It raised only Rs. 131 million from this issue.²⁵ The majority of the investors in the IPO were foreigners, because few Indians cared to place bets on a company that was not part of the big family groups that dominated the Indian business environment. Consequently, Infosys was made more aware of the importance of investor relations than were most companies. "What we have done in investor relations transcends what we've done in software," claims Nilekani.²⁶ This issue was followed by a private placement of Rs. 250 million in October 1994 with institutional investors. Infosys used the proceeds from these issues to expand its operations in the southern Indian City of Bangalore.

The company acquired land from the State of Karnataka in Bangalore, India and built a 160,000 square foot 'campus' on five acres in a Software Technology Park in Electronics City.

The booming economy, a result of the reforms announced by the Indian government in 1991, had led to various states providing incentives to companies to locate in their areas. The government made land available to companies on a long-term rent-free lease that automatically transferred ownership to the company after 25 years, provided the land was used for the purposes specified. Over the next several years, Infosys established a number of offices around the country and the world. Its worldwide sales headquarters were in Fremont, California, and it had branch sales offices in Atlanta, Bangalore, Boston, Chennai, Chicago, Dallas, Detroit, Frankfurt, London, Los Angeles, Mumbai (formerly Bombay), New Delhi, New York, Seattle, Tokyo, and Toronto. The majority of these offices were small leased facilities that carried an option to expand as required. In addition, the company had established software development and training facilities in Bangalore, Bhubaneswar, Chennai, Mangalore, and Pune to meet the needs of its customers and employees. (See Exhibit 9 for Infosys offices worldwide.)

By the late 1980s, the big picture was clear to Infosys – international business was crucial to its survival and growth. In the early 1990s, in keeping with its growth into a mature organization, it drafted a clear business strategy both to counter threats from competitors and to meet the challenges of operating globally. Many companies had sprung up to take advantage of the growing global demand for software development services. Various MNCs, such as Citicorp, Texas Instruments, Digital Equipment, Hewlett Packard, and IBM, wanted to get in on the act themselves and were starting to set-up operations through subsidiaries and joint ventures. Many of them chose Bangalore for their headquarters not only because of the availability of cheap skilled labor but also because the time difference between India and the States guaranteed a 24-hour work cycle on joint development projects. Murthy observed, “We felt that in a few years only the fittest will survive. A maturing and polarization of the industry was coming that would separate the men from the boys – global players from the also-rans. It was time to formulate a clear strategy for Infosys that would ensure that it remained a global player for many years to come!”²⁷

Infosys’ strategy revolved around five main elements:

A world-class operating model. Management believed that one of the most critical factors to Infosys’ success was a commitment to pursue high quality standards in all aspects of its business. The company decided that it would differentiate its services by rigorously adhering to highly evolved processes, including a detailed approach to planning and execution, multi-level testing, and careful tracking and analysis of quality control. The department of quality control and assurance was established under K. Dinesh. A Quality and Productivity Charter that described the aspirations of the company was created, and every employee was given a laminated copy that they could carry with them (Exhibit 10.) The company aggressively pursued the strategy of ‘zero-defect’ tolerance and achieved ISO 9000 certification in 1993 and Level 4 CMM, a level achieved by only 2% of the more than 1,000 software companies tested worldwide, in late 1997. In addition, Infosys became among one of the first Indian companies to adopt US GAAP reporting

in fiscal 1995 and quarterly audited Indian financial statements in fiscal 1998. (See Exhibit 11 for a history of firsts established by Infosys among Indian companies.²⁸)

Focus on human resources as a core strength. Infosys believed that its continued success relied heavily upon its ability to recruit, train, deploy, and retain highly talented IT professionals. “Our assets walk out of our buildings every evening....We have to get them to come back! The work atmosphere at Infosys is an incentive for our employees to stay with us,” remarked Raghvan. “The Human Resources Department focuses on the cream of Indian analytical talent and selects candidates based on analytic ability and ‘learnability’. We have gone from being just another company to a ‘day-one’ recruiting company at the nations top schools.” (A ‘day-one’ company is a company that recruits on the first day of the recruiting season. At several of the top Indian educational institutions, companies are invited to recruit on campus on certain days of the recruiting season based on their popularity among students. ‘Day-one’ companies typically make offers of employment to students before other companies start their recruiting on campus, and have an edge over these other firms.) Through a campus-like environment, Infosys sought to foster a collegial atmosphere and informal culture that was designed to promote an entrepreneurial spirit and the free flow of ideas. The company also became the first Indian organization to place a value on its human resource capital and brand equity in its balance sheet, stressing the importance it placed on these intangibles. “While the value of our Human Resources for fiscal '97 is placed at Rs. 2,785.5 million, brand value is pegged at Rs. 1,728.3 million. Cumulatively, the value of intangibles is Rs. 4,513.8 million, which is four times the value of our tangible assets,” observed Murthy.²⁹ Corresponding numbers for fiscal '98 indicate that Infosys values its human resources at Rs. 5090 million and its brand name at Rs. 5033 million, giving it a total value of intangibles of Rs. 10123 million.

Differentiate by providing managed software solutions. Since its beginning, Infosys had dedicated itself to providing managed software solutions, many of which were offered on a fixed-price, fixed-time frame basis. By taking full project management responsibility on every project, the company enabled its clients to receive high-quality, cost-effective solutions at lower risk. At the same time, Infosys felt that it would have to move from low value-added areas like on-site programming to more highly valued services like IT consulting and product development in order to preserve its margins in the long-term. It also sought to expand into the area of packaged software solutions to address customers’ common requests and successfully established a brand of bank automation solutions known as Bancs2000. “Indian companies are seen as good constructors.... The perception is that given a problem we could easily write a program to solve it. On the other hand, firms like Arthur Andersen and Deloitte and Touche are hired early in the process and paid a premium because they are perceived to have a better grasp of the business. The trouble is that we seem to be brought in after the major decisions are made,” Nilekani explained.³⁰ Working on the principle that a satisfied customer leads to a successful company,

Infosys sought to deliver high-quality, cost-effective solutions that exceeded the customer's expectations. This goal led to Infosys becoming the natural choice for most of their customers' repeat transactions.

Exploit a well-established offshore development model. Taking a close look at its business, Infosys realized that an essential component of its competitive advantage was its access to low-cost engineering talent in India. It was disruptive to ship this talent across long distances to perform work on-site over short periods. In addition, costs associated with such moves eliminated many of the cost savings that the company could pass on to its customers. The company made several significant investments in infrastructure to manage and execute projects in multiple locations with seamless integration. The first step in this process was to establish the credibility of the Infosys name in the market among its customers. To that end, Infosys typically undertook its first project on-site and established customer confidence in its ability to produce quality, problem-free work. Once it established this credibility, customers felt confident with the offshore concept given that Infosys had the procedures in place to ensure continuous quality monitoring as determined by its Level 4 status in CMM. Offshore development also had a number of advantages.

- Increased flexibility in resource allocation
- Less uncertainty associated with the need to obtain visas and documentation for programming staff to travel abroad
- Increased cost advantages for the customer and profits for Infosys
- Faster turnaround time – a problem communicated in the evening could be resolved by morning due to the time difference between India and the US
- Finally, one of the biggest advantages of an offshore model was preventing the loss of key human assets to the global marketplace. Countries like India face a “brain drain” of talent as foreign corporations recruit increasing numbers of their technical personnel.

By 1998, Infosys was able to successfully execute over 80% of its project work in India while maintaining high levels of customer satisfaction. The company had 11 development centers in India and planned to expand these significantly as it established a global presence. Doing so would allow it to provide faster turnaround and take advantage of synergies in different time zones and markets.

Maintain an equitable business and client mix. This part of Infosys' strategy was the last to be introduced. The company recognized four fundamental tenets of a well-run business. First – predictability; second – sustainability of predictions; third – profitability; and fourth – a good 'de-risking' model. The common thread in all these tenets is an aversion to surprises of any kind. In Infosys-speak, 'de-risking' means limiting its exposure to businesses of various kinds. This

strategy stems from Infosys' history. In 1995, GE accounted for over 20% of Infosys' revenues and 8% of profits.³¹ At the time the contract was to be renewed, however, both sides were unable to agree on the terms and a competitor won the contract. After this happened, Infosys implemented a prudent customer 'de-risking' strategy to ensure low dependence on any one customer. Another key aspect of this strategy, as exemplified by its response to the Y2K problem, was to ensure that no single business segment accounted for more than 25% of its revenues. Although the market demand for solutions in this area escalated with the approach of the new century, Infosys adopted a more sustainable long-term strategy. It gradually reduced its dependence on these projects so that it was generating less than 15% of revenues from these projects by early 1999. It adopted strict guidelines for acceptance of clients to meet its overall revenue and profitability goals. For fiscal 1997, fiscal 1998, and the nine months ended December 1998, its largest client accounted for 15.6%, 10.5%, and 6.7%, respectively, of revenues, and its five largest clients accounted for 43.1%, 35.1% and 29.2%, respectively, of revenues.³² Establishing this balance was key to ensuring that the technology skill set of the company's IT professionals remained diversified. Such diversification was seen as critical not only in providing the company the flexibility to adapt to changing market conditions but also in attracting and retaining highly skilled professionals who seek the opportunity to learn new skills.

Infosys' Corporate Culture – A History of *Firsts*

When the company was founded in 1981, it was guided by a few simple principles.³³ Its founders realized early that some basic tenets consistent with a good value system had to be rigorously observed for the firm to be successful on a sustainable basis.

The first rule was never to use corporate resources for personal benefit. This means that no one uses a company car for a personal errand – a radical break from extant Indian business culture, where corporate titans sometimes have difficulty separating ownership from control. An Infosys employee summed up this policy by saying, "frequently in India, corporate officers make personal use of company assets. We, the employees, have to put up with such practices because there is no choice. Nevertheless, such practices lead to a growing alienation and rebellious withdrawal of creative input. That doesn't happen here at Infosys."

The second rule is that the company treats all its stakeholders, be they customers, employees, shareholders, vendors, or society with fairness, honesty, and transparency. The third rule is that all people are to be treated with equal respect. Both the second and the third rules have led to Infosys having a deeply rooted concern for its employees. The corporate headquarters has a quality daycare center with trained teachers, a gymnasium, tennis courts, library, volleyball and basketball courts, and a fully staffed medical center. In addition, there is a highly subsidized cafeteria with excellent food, and comfortable sleeping facilities for employees who need to work late to finish a project. Although many companies in India have begun to offer

some of these benefits to their employees, what makes Infosys different is that the principals seem to care just as much about employee convenience as they do about the advantages that these practices provide. "We have always viewed Infosys as a vehicle for creating wealth for our employees," says Murthy.³⁴ Thus, Infosys became the first Indian company to offer low-cost stock options to most of its employees. Based on seniority, over 60% of employees are eligible to receive stock options. With the run up in its share price, this practice has created many millionaires among the ranks of employees. An unexpected bonus is that employees now focus on adding value to the company so that its stock price continues to appreciate. "We want our employees to build up capital assets, to be financially independent, and to be proud of where they work," says Raghavan, who heads the Human Resources function (See Exhibit 12 for an organization chart.) To that end, Infosys makes substantial no-interest and low-interest loans to employees, invests heavily in ensuring that its 5-acre campus is well maintained and landscaped, and provides all employees with state-of-the-art technical equipment. In the Indian business environment, where it is not uncommon to see many employees sitting behind 486 and even 386 PCs, Pentium® computers are the norm for Infosys employees.

Infosys also emphasizes the importance of corporate culture. Its fourth rule is that all discussions are issue based. This principle means that important issues are debated fiercely, if necessary, without degenerating into personality conflicts. Employees are free to dissent with the views of their supervisors and are encouraged to set forth their ideas, but everyone works towards implementing it to the best of their abilities once a decision is reached.

To ensure that employees will fit into the corporate culture, Infosys uses a careful selection process to ensure that it selects individuals who are not only extremely bright but also have an attitude and openness that is conducive to teamwork and a willingness to learn. It focuses its recruiting efforts on the top 20% of students from the engineering departments of Indian universities. Job applicants are administered a series of tests and interviews that are designed to select only the best, who can also learn on the job. In 1998, the company received approximately 74,500 job applications, tested 22,483 applicants, interviewed about 6,300 and extended offers to about 2,000, of whom approximately 1,550 accepted, making it one of the most selective recruiters in India. The company invests heavily in training, including 14-week training sessions for newly recruited employees, as well as a variety of two-week skills enhancing workshops and continuing education programs that are administered by a 35-person faculty.

Infosys also empowers employees to an extent unheard of in India and more than most companies worldwide do. Senior management has an 'open door' policy, and it is common to see employees discussing their issues and concerns with members of senior management. Most employees sit in cubicles, with managers' cubicles being in close proximity to their subordinates, thus allowing for a free exchange of ideas and dialogue. There are the usual avenues of involvement, such as a committee of employees that decides the cafeteria menu, but there are

also the unusual and downright radical means of autonomy. One manager told his six direct reports how much money was available for raises, then sequestered them in a room and asked them to allocate it among themselves. If they failed to reach a decision, he would then make it himself. The employees debated, came up with a solution – not a weak ‘everybody gets the same’ compromise – and told him. He implemented it and saved the hours he had spent in previous years making this decision and then having to defend it.³⁵ Infosys now has an internal ‘best practices’ forum so that other managers can see how to use the methods other managers have developed for their own needs. Because of these policies, Infosys enjoys a very high employee retention rate.

Yet, some of the senior employees at Infosys were worried about how well the culture of the company had diffused as the company expanded. “A lot of the new people come directly into senior positions and start to want to change things to their way of working right away,” remarked a 12-year veteran of Infosys.³⁶ “In the old days you joined at a junior position and worked your way up the company ranks, which allowed you to understand how the company operated and what made its culture unique. Today, many of the newer employees coming to senior positions are trying to run their departments as separate entities. This is causing us to move from a company with a single culture to a company with many individual departmental cultures.” Senior management acknowledged that although this practice was true in some instances, it still argued that since a majority of Infosys employees joined the company fresh out of university, they were able to preserve the culture of the company effectively. No one argued, however, that this issue would be a major challenge once the company expanded globally and started recruiting personnel in different countries for their offices.

Infosys in 1998

From 1994 to 1998, Infosys experienced compound annual revenue and net income growth rates of 63.6% and 46.8% respectively, and grew from just under 600 professionals to over 3,500 by the end of 1998.³⁷ The company’s growth strategy focused on a few key elements that helped it achieve these phenomenal growth rates, which were seldom experienced by firms in developing countries.

The first core element of Infosys’ growth strategy was to broaden its service and product offerings (see Exhibit 13 for details of products and services offered.) As a full-service provider, the company believed that it could increase its revenues from existing clients as well as new clients by offering a broader range of products and services. This strategy was also in keeping with its core principle of ‘de-risking’. In 1997, it began initiatives to develop practices focused on e-commerce, and Internet/intranet services, and ventured into packaged applications implementation in 1998. It divided its core services and products group into strategic business units (SBUs) that focused on specific areas of the company’s business and allowed groups to

gain expertise in their respective areas. Although core functional expertise resided within respective SBUs, it was not uncommon for these units to work together on multiple focus projects.

The second element of the growth strategy stressed increasing business with existing clients while developing new clients. In 1998, the company performed services for more than 100 clients across the world. It used its initial work at a client site to gain a better understanding of the client's core business and then tailored its products to expand its offering to that client. This approach was highly effective, as Infosys generated more than 80% of its revenues from repeat customers in fiscal years 1997, 1998, and the nine months ended December 1998. At the same time, it continued to focus on getting new customers. The company used its expertise in Year 2000 conversion services and its newly developed focus on Internet/e-commerce to forge relationships with 13 new customers in 1998. In 1998, it also started to expand its global sales force with to the hope of capturing a larger share of the market for software development services. By establishing development centers in a number of countries, Infosys hoped its geographic presence would allow it to enhance its ability to establish and support new client relationships.

The third element of its growth strategy was to increase its revenue per IT professional and at the same time expand and diversify its base of IT professionals. In order to achieve these goals, it focused on building expertise in vertical markets, refining its software development and tools, and storing and disseminating institutional knowledge. It adopted a policy that continuously monitored revenue per professional and used skills developed in certain areas of the SBUs across multiple areas. It also focused increasingly on getting more fixed-price, fixed-time frame projects, which management believed would provide the benefit of increased revenue with reduced client risk, while offering an incentive to ensure projects were performed efficiently. The vertical integration also gave Infosys the opportunity to attract better-talented IT professionals who sought to enhance their skill sets. It was in the process of adding an additional 890,000 square feet of office space in a plot adjacent to its current Bangalore headquarters. The opening of this new complex was set to take place in 1999. In addition, it was contemplating expanding its development facilities in India and adding new facilities in the United States, Europe, and Asia, all of which were expected to be completed within the next two to three years and bring the total headcount of the company to 6,000 employees.

The last element of Infosys' growth strategy involved pursuing selective strategic acquisitions, which it believed would allow it to broaden its technical expertise and further expand its vertical product offerings. It established a strategic planning group at its corporate headquarters and charged this group with the task of identifying suitable acquisition targets in Infosys' foreign markets. Although it had not yet undertaken any acquisitions, it was searching for

a couple of small firms in each of its major foreign markets that would give it access to newer technologies and different groups of customers.

Conclusion

As he reminisced about the beginnings of Infosys, Narayana Murthy wondered if all that the firm had done in the past few years was enough to sustain its momentum. Many issues still had to be addressed. As Infosys expanded exponentially in the next few years, some wondered how it could maintain the entrepreneurial spirit that had been established in the early years. It was difficult to grow at such a rapid pace and still keep the culture that had made the firm so successful. Another critical factor was the ADR listing on the NASDAQ stock exchange, which had to be aborted in late 1998. If Infosys was to offer world-class compensation to attract and retain the personnel it required to become a global powerhouse in software services, it needed to have a viable stock option plan in its foreign markets to offer to its prospective employees. Finally, the changes in senior management of the company announced in August 1998 would allow Murthy to focus more on the company's global expansion strategy. In April 1999, Murthy expected to be able to focus more on these issues even though he did not expect to distance himself totally from Infosys' daily operations.

Infosys' investment bankers in the States had recently indicated that by March 1999, the US stock market would have recovered enough from the decline of fall 1998 for Infosys to retry an ADR listing on NASDAQ. In anticipation, the company was already gearing up for this event. It planned to open a US investor relations office, and senior management had started selecting personnel to staff this office. Once the ADR issue was complete, the next phase of the globalization plan could go into effect – creating and staffing offices in all of the firm's key markets. The big question of how they would continue to maintain and spread the culture and entrepreneurial spirit of the company through all of these offices still remained. Although doing so was possible in a company that grew in a controlled manner, the firm's current expansion plans did not offer it that luxury. Finally, there remained the issue of product mix. Infosys had managed to diversify its product mix sufficiently so as to not be overly dependent on a single product line, but the Y2K problem that had so plagued the IT industry would be nonexistent in a couple of years. Murthy worried what impact this challenge would have on companies that had built their expertise in this area and would now have a surplus of talent available. He believed that some of these companies would be willing to undercut Infosys on price to win over larger customers. Maintaining offices and development centers in each of its major markets would mean that Infosys' costs would rise, meaning that it might not be able to compete effectively. The Internet and e-commerce seemed to offer the greatest potential in the immediate future and Infosys had prepared itself to offer services to its customers in this area. Would this diversification be enough? Many questions remained and, although it was only January, Murthy knew that 1999 was going to be an extremely challenging year.

Exhibit 1

THE ECONOMIC TIMES

January 13, 1999

How to be a millionaire

THERE are a million ways to make a million. Here is one. If you'd invested Rs. 10,000 in buying shares of Infosys (ET's Company of the Year in 1998) in 1993 when it floated its initial public offer (IPO), today your money would be worth, hold your breath, Rs 14.7 lakh (or Rs 1.47 million) at the closing price of Rs. 3,488. Not bad.

Each Infosys share, based on an IPO price of Rs 95, is worth Rs 13,952 in today's market - after factoring in two 1:1 bonus issues in October 1994 and October 1997. (Another 1:1 bonus offer is in the offing, but the current market price is cum-bonus.)

Truly, Infosys chief NR Narayana Murthy can claim to be a follower of the legendary Jack Welch. According to Fortune magazine, \$10,000 invested in GE in 1980 when Welch took over as chairman of the multinational is today worth about \$368,479, that is a creation of \$200 billion in new wealth for shareholders.

Mr. Murthy too has done his bit by his shareholders. The market capitalisation of Infosys, which is what all the shareholders are together worth, has soared from Rs 31.5 crore in 1993 to close at Rs 5,600 crore today, an appreciation of 17,678 per cent.

To think that when Infosys went public, there were stories that Enam Securities, as underwriters, had to pick up the unsubscribed portion! Although officially, no one at the time admitted to a delevement, Mr. Murthy would probably not bother to deny such stories today. On the contrary, it would go down as market lore.

And all those who thought a premium of Rs. 85 on an infotech stock of Rs. 10 face value was much too much, must now be eating their hearts out.

For all those who work at Infosys and are sitting on large stock options, may the good times roll.

Exhibit 2

Infosys Technologies Limited

Audited Financial Results for quarter and nine months ended December 31, 1998.

All amounts in millions of Rupees

Particulars	Third quarter ended December 31,		Nine months ended December 31,		Financial year ended March 31, 1998
	1998	1997	1998	1997	
Income from software development					
- overseas	1,378.3	710.5	3,523.1	1,739.8	2,509.4
- domestic	16.2	19.8	46.6	50.2	67.2
Other income	7.2	3.3	20.6	20.5	27.1
Total Income	1,401.7	733.6	3,590.3	1,810.5	2,603.7
Software development expenses	664.8	389.2	1,882.2	995.2	1,412.1
Administration and other expenses	121.8	88.9	321.0	209.5	305.4
Provision for contingencies	33.3	-	33.3	-	-
Provision for investment in subsidiary	35.3	-	70.6	-	-
Total Expenses	855.2	478.1	2,307.1	1,204.7	1,717.5
Profit before Interest, Depreciation and Taxes (PBIDT)	546.5	255.5	1,283.2	605.8	886.2
Interest	-	-	-	-	-
Depreciation	91.2	58.1	214.7	153.2	227.5
Profit before tax	455.3	197.4	1,068.5	452.6	658.7
Provision for tax	77.9	15.0	170.4	39.9	55.0
Profit after tax from ordinary activities	377.4	182.4	898.1	412.7	603.7
Extraordinary income (net of tax)	23.5	-	23.5	-	-
Net Profit	400.9	182.4	921.6	412.7	603.7
Paid up equity capital	160.2	160.2	160.2	160.2	160.2
Reserves	NA	NA	NA	NA	1,569.4

Source: Infosys Technologies Limited

Exhibit 3

Infosys Founders

1. *N R Narayana Murthy*: Mr. Murthy is Chairman of the board and Chief Executive Officer of Infosys Technologies Limited. He has a variety of experience in the fields of developing software products, project management and a detailed exposure to the international business environment. Mr. Murthy has also served as the President of National Association of Software and service Companies (NASSCOM). He was awarded the “IT Man of the Year” award for 1996 by Dataquest, India and received the prestigious JRD Tata Corporate Leadership Award in 1998. He was credited with designing the first BASIC INTERPRETER for an Indian computer manufacturer. 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 (IIT), Kanpur.
2. *Nandan M Nilekani*: Mr. Nilekani serves as the Head of the Marketing and Sales functions of Infosys Technologies Limited. Prior to this he held various positions at the company that included 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 is the head of Human Resources and Education at Infosys Technologies Limited. Prior to this he held various senior management positions at the company including serving as its Director. 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 received his Bachelors degree in Electrical Engineering from Andhra University.
4. *S Gopalakrishnan*: Mr. Gopalakrishna is the Head of Client Delivery and Technology at Infosys Technologies Limited. Prior to this he was Head of Technical Support Services at the company and held various other positions including Technical Vice President of the KSA/Infosys joint venture. He has over 19 years of experience in the software technology industry. He holds a Masters degree in Physics and Computer Science from IIT, Chennai.
5. *K Dinesh*: Mr. Dinesh is the Head of Quality, Productivity and MIS at Infosys Technologies Limited. Prior to this he 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 received a Masters degree in Physics from the University of Kerala and a Masters in Computer Science from Boston University.

Source: Infosys Technologies Limited

Exhibit 4

Key Infosys Clients

In fiscal 1998, the following clients accounted for over 60% of Infosys' revenues.

Financial Services

Avco Financial Services, Inc.
Bank of America NT & SA
BankBoston, NA
Goldman, Sachs & Co.
Northwestern Mutual Life Insurance Co.
The Western and Southern Life Insurance Co.
VISA International

Manufacturing and Distribution

ConAgra Inc.
Cooper industries, Inc.
Kent Electronics Company
Levi Strauss & Co.
Quest International
Reebok International Ltd.
Salomon SA
Toshiba Corporation

Telecommunications and Technology

Apple Computer, Inc.
Ascend Communications, Inc.
AST Research, Inc.
Belgacom Mobile NV/SA
Bell Atlantic Corporation
NCR
Northern Telecom Limited
Epson Software Development Laboratory, Inc.

Retail

Ann Taylor, Inc.
BJ's Wholesale Club, Inc.
Sainsbury's Supermarkets Limited
JC Penney Company
Nordstrom, Inc.
Staples, Inc.
The Gap, Inc.
The TJX Companies, Inc.

Source: Infosys Technologies Limited

Exhibit 5

Infosys Key Financial Measures, 1982 to 1993

Figures in Rs. millions

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Sales	1.2	2.6	6.0	10.3	10.0	19.1	27.5	25.4	41.5	55.0	94.6	145.2
Exports	1.1	2.5	3.7	5.3	4.2	9.9	17.4	16.7	26.0	36.8	74.2	121.4
Gross Profit	0.4	0.3	0.9	3.1	2.1	4.8	7.6	5.3	8.0	9.2	25.0	38.4
% Gross Profit	33.3%	11.5%	15.0%	30.1%	21.0%	25.1%	27.6%	20.9%	19.3%	16.7%	26.4%	26.4%
Net Profit	0.4	0.3	0.9	3.0	1.8	3.8	4.9	4.5	4.6	7.5	22.5	35.1
% Net Profit	33.3%	11.5%	15.0%	29.1%	18.0%	19.9%	17.8%	17.7%	11.1%	13.6%	23.8%	24.2%
Net Worth	0.4	0.6	1.8	4.6	5.9	10.1	14.9	18.3	22.1	28.0	47.6	142.4

Source: Infosys Technologies Limited

Exhibit 6

Worldwide Computer Software and Dedicated Programming Services Market

Year	North America	Europe	Asia	South America	Rest of the World	Total World
1980	19.6	11.5	4.8	0.8	0.8	37.5
1985	40.4	25.0	13.0	2.0	1.7	82.2
1986	45.0	28.5	15.1	2.0	1.9	92.5
1987	52.0	30.0	17.3	2.0	2.0	103.3
1988	60.0	32.0	20.2	2.3	2.3	116.9
1989	71.2	34.9	22.9	2.5	2.5	134.0
1990	77.5	28.0	24.8	2.7	2.7	145.7
1991	85.2	40.5	28.0	3.2	3.2	160.1
1992	96.4	42.9	30.9	3.2	3.6	177.0
1993	105.5	46.5	34.6	3.0	4.5	194.1
1994	113.0	49.7	37.4	3.0	5.5	208.6
1995	125.1	54.5	41.0	3.5	6.5	230.6
1996	138.5	58.0	44.8	3.8	7.0	252.1
1997	161.0	62.5	47.0	4.7	7.6	282.0
2008**	385.0	134.0	115.0	9.2	23.0	666.2
CAGR						
87-97	12.00%	7.60%	10.50%	8.90%	14.30%	10.60%
97-08	8.20%	7.20%	8.50%	6.30%	10.60%	8.10%

Source: ITI, Industry Statistics Programs, U.S. Department of Commerce Forecast

Exhibit 7

Key Measures of India's Software industry

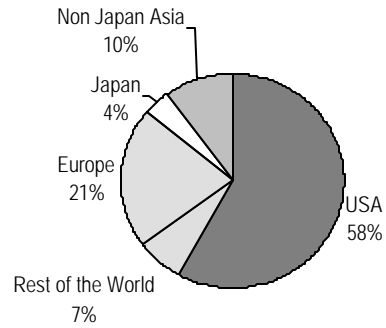


Figure 1. Indian Software Exports by Region - 1998

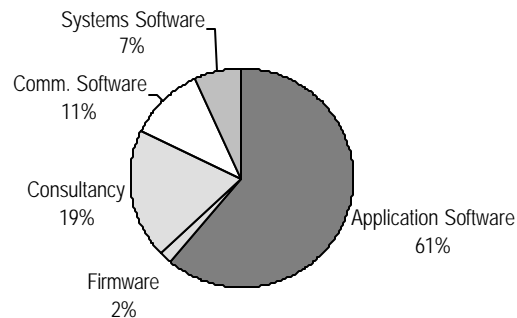


Figure 2. Indian Software Development Focus - 1998

Table: Software Export Industry: Type of Services

(Figures in Rs. million)

	1998 - 99	1999 - 2000	2000 - 01	2001 - 02
Software Export Industry	110,000	175,000	265,000	400,000
On-Site services	63,800	99,750	147,750	200,000
Offshore Services	37,400	59,500	92,750	140,000
Products & Packages	8,800	15,750	26,500	60,000

Source: NASSCOM, A Strategic Overview of the Indian Software Industry

Exhibit 8

Top Twenty Software Exporters in the Indian Market

(The top twenty software houses account for 58.49% of the total software export revenues in 1998-99. The top twenty software houses, along with the percentage of their revenue of total software exports, is given below:)

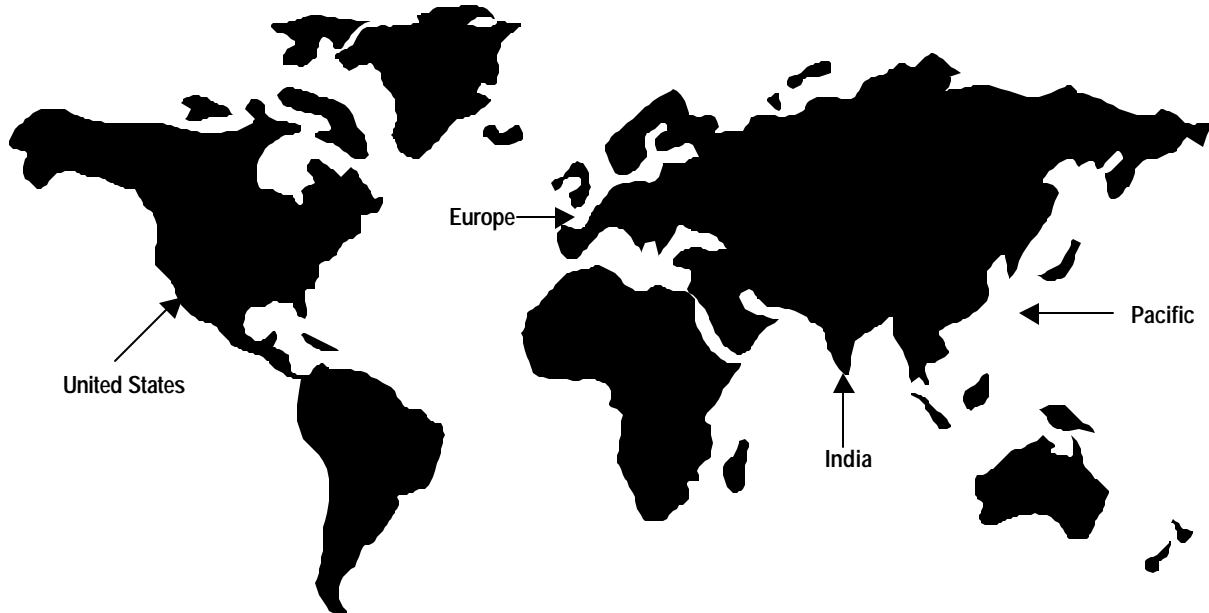
(Figures in Rs. million)

Rank	Company	1998-99 Exports	Percent of Export Market
1	Tata Consultancy Services	15,185.00	13.88%
2	Wipro Infotech Software & Services	6,325.00	5.78%
3	Pentafour Software & Exports Limited	5,118.30	4.68%
4	Infosys Technologies Limited	5,002.50	4.57%
5	NIIT Limited	3,949.60	3.61%
6	Satyam Computer Services Limited	3,766.20	3.44%
7	Cognizant Technology Solutions	2,900.30	2.65%
8	IBM Global Services India Pvt. Limited	2,276.30	2.08%
9	DSQ Software Limited	2,233.00	2.04%
10	Tata Infotech Limited	2,208.10	2.02%
11	Patni Computer Systems Limited	2,199.00	2.01%
12	HCL Technologies India Pvt. Ltd.	2,074.00	1.90%
13	Mahindra-British Telecom Ltd	1,721.90	1.57%
14	L&T Information Technology Limited	1,444.90	1.32%
15	International Computers (India) Limited	1,428.90	1.31%
16	IMRGlobal Limited	1,397.30	1.28%
17	Citicorp Information Technology Industries Limited	1,334.70	1.22%
18	Mastek Limited	1,296.80	1.19%
19	Complete Business Solutions (India) Ltd	1,088.30	0.99%
20	Silverline Industries Limited	1,039.50	0.95%

Source: NASSCOM, A Strategic Overview of the Indian Software Industry

Exhibit 9

Infosys Offices Worldwide



United States and Canada

Fremont, CA
Deedham, MA
Bellevue, WA
Bridgewater, NJ
Dallas, TX
Marietta, GA
Newport Beach, CA
Oakbrook Terrace, IL
Troy, MI
Toronto, ON

Europe

Milton Keynes, United Kingdom
Frankfurt, Germany

India

Bangalore
Delhi
Mumbai

Development Centers*

Bangalore (6)
Bhubaneshwar (1)
Chennai (2)
Mangalore (1)
Pune (1)

Pacific

Tokyo, Japan

**Numbers in parenthesis indicate actual number of development centers in each city*

Source: Infosys Technologies Limited

Exhibit 10

Infosys Quality and Productivity Charter

*Infosys Quality and Productivity
Charter*

We pledge that

- We shall recognise and respect our customers' right to receive quality products and services, on time and within budgeted cost.
- We shall endeavour to exceed our customers' expectations of competence, performance, delivery schedule and value for money, such that they take pride in ownership of Infosys products and Infosys becomes their 'Natural Choice' for repeat business.
- We shall strive constantly to improve our standards of Quality and Productivity.
- We shall achieve this in an atmosphere of fairness, integrity, dignity, courtesy and co-operation towards customers, suppliers, employees, investors and competitors.

(Signed)
N.R. Narayana Murthy
Chairman, Infosys Group
30th April, 1994

Source: Infosys Technologies Limited

Exhibit 11

Infosys' History of Firsts

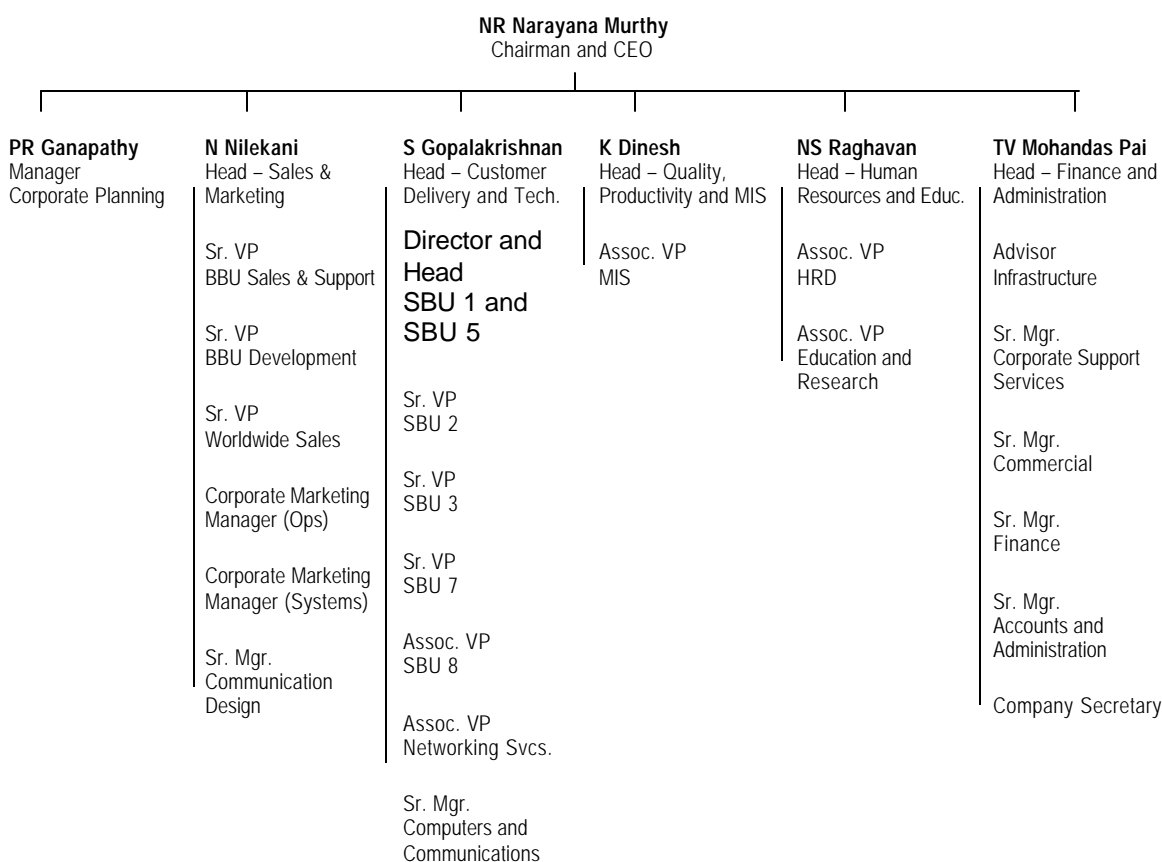
INFOSYS FIRSTS

Infosys Technologies Ltd. was:

1. The first Indian company to follow the GAAP system of accounting.
2. The first Indian company to value human resources and publish their valuation with its statement of accounts.
3. The first Indian company to value its brand and publish this information with its balance sheet.
4. The first Indian company to publish all required and non-required disclosures.
5. The first Indian company to distribute audited quarterly reports to its investors.
6. The first Indian company to guarantee publication of audited annual balance sheets by April 15 of each year. (Year end closing is March 31)
7. 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.
8. The first Indian company to offer employee stock options to all qualified employees.
9. The first Indian company to have installed 1,400 nodes in one location.
10. The first Indian company to have 160,000 sq ft of built up software area in one location in India.

Exhibit 12

Infosys Organization Chart (before organization changes announced in August 1998)



Source: Infosys Technologies Limited

Exhibit 13

Infosys Service Offerings and Products

The company's services include software development, maintenance and re-engineering services as well as dedicated Offshore development centers (OSDCs) for certain clients. In each of its service offerings the company assumes full project management responsibility for each project it undertakes rather than providing supplemental personnel to work under a client's supervision. In addition to its IT services, the company as well as its minority owned subsidiary, Yantra, also develop and market certain packaged applications software.

Software Development

The company provides turnkey software development, typically pursuant to fixed-price, fixed-time frame contracts. The projects vary in size and may involve the development of new applications or new functions for existing software applications. Each development project typically involves all aspects of the software development process including definition, prototyping, design, pilots, programming, testing, installation and maintenance. In the early stage of a development project, Infosys personnel often work at a client's site to help determine project definition and to estimate the scope and cost of the project. Infosys then performs design review, software programming, program testing, module testing, integration and volume testing, primarily at its own facilities in India. For example, for a telecommunications client experiencing deregulation and declining market share, the company partnered with a specialty marketing firm and the client to complete the project within six months ensuring the system's technical proficiency and enabling the client to reverse the trend of declining market share.

Software Maintenance

The company provides maintenance services for large legacy software systems. Maintenance services include minor and major modifications and enhancements (including Y2K and Eurocurrency conversion) and production support. Such systems are either mainframe based or client server and are typically essential to a client's business, though progressively over time they become more difficult and costly for the clients internal IT department to maintain. By outsourcing the maintenance responsibilities to Infosys, clients can control costs and free their IT departments for other work. The company's IT professionals take an engineering approach to software maintenance, focusing on the long-term functionality and stability of the client's overall system and attempting to avoid problems stemming from "quick fix" solutions. The company performs most of the maintenance work at its own facilities using satellite-based links to the client's system. In addition, the company maintains a small team at the client's facility to coordinate support functions. Infosys was a pioneer in managing time-zone differences between India and the United States to provide near 24-hour maintenance services. As an example, the IT department of a large retailer with inadequate and inflexible systems was overburdened by both building new systems and maintaining the current legacy structure. The company was able to assume maintenance responsibilities for these systems in a short time frame and reduce maintenance costs to the client by using its offshore facilities.

Software Re-Engineering

The company's re-engineering services assist clients in migrating to new technologies while extending the life cycle of existing systems that are rich in functionality. Projects include re-engineering software to migrate applications from mainframe to client server architectures, to extend existing applications to the Internet, to migrate from existing operating systems to UNIX or Windows NT or to update from a non-relational to relational database technology. For companies with extensive proprietary software applications, implementing such technologies may require rewriting and testing millions of lines of software code. As with its other services, the company has developed proven methodologies that govern the planning, execution and testing of the software re-engineering process. For instance, for a nationwide manufacturer and distributor experiencing operating inefficiency with a legacy system installed in its two call centers, the company re-engineered the system to run in a distributed processing environment with front-end Internet browser based capabilities allowing 24-hour Internet access to the client's distribution

systems. As a result the client was able to consolidate its call center workforce into one location and reduce the workforce by over 50%.

Dedicated Offshore Development Centers

The company has pioneered the concept of dedicated OSDCs in which a software development team that is dedicated to a single client uses technology, tools, processes and methodologies unique to that client. Each dedicated OSDC is located at a company facility in India and is staffed and managed by the company. Once the project priorities are established by the client, the company, in conjunction with the client's IT department, manages the execution of the project. By focusing on a single client over an extended time frame, the dedicated OSDC team gains a deeper understanding of the client's business and technology and can begin to function as a virtual extension of the client's software team.

New Services

The company is also focused in certain new service areas such as (i) Internet consulting, which developing applications for Internet/Intranet solutions and E-Commerce solutions; (ii) Euro conversion, which assists clients in making their systems Euro compliant; and (iii) Engineering services, which include software product design. For example, the company recently developed an integrated E-commerce online shopping site for one of its US clients, which included four different systems and gave the company complete cycle responsibility for the project.

Software Products

In addition to the IT services described above, the company develops and markets certain proprietary software applications. BANCS 2000 is an online, retail and corporate banking system that offers rich functionality, scalability and flexibility for automation of banking operations. Banks in emerging markets that seek to implement state-of-the-art banking technology and achieve high levels of client service use this product. BANCS 2000 has been installed at more than 420 bank branches in India, Sri Lanka, Nepal, Indonesia and Tanzania. Through Yantra, the company also develops and markets WMSYantra, an open systems software package for warehouse management.

Source: Infosys Technologies Annual Report

Endnotes

- 1 The Economic Times, "Third Quarter Result Card", January 13, 1999.
- 2 The Economic Times, "How to be a Millionaire", January 13, 1999
- 3 ITL Corporate Press Release, November 19, 1998
- 4 Financial Times, "US Listing to Keep Infosys a Step Ahead", September 5, 1997
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- 6 Onsite interviews conducted by the author at Bangalore in January 1999
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- 11 *ibid.*
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- 14 Information Technology Industry Council Databook, "World Economy And Geographic
Distribution Of The Information Technology Industry Markets", January 1, 1998
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- 16 Information Technology Industry Council Databook, "World Computer Software And
Dedicated Programming Services Market By Region", January 01, 1998
- 17 NASSCOM, "The Millennium Bug – Year 2000 Solutions", 1997
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- 20 NASSCOM, "A Strategic Review of the Software Industry in India", 1998-99
- 21 *ibid.*
- 22 *ibid.*
- 23 *ibid.*
- 24 *ibid.*
- 25 Infosys Prospectus, February 23, 1993
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- 27 Onsite interviews conducted by the author at Bangalore in January 1999
- 28 Business Barons, "Infosys Technologies – Global Class!", May 31, 1997
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- 30 Onsite interviews conducted by the author at Bangalore in January 1999
- 31 Business World, "Infosys – Global Gambit", November 7, 1998
- 32 Corporate Financial Statements, Infosys Technologies
- 33 Times of India, "Why Infosys is the Darling of Investors", April 19, 1998
- 34 AsiaWeek, "Asia's Business Hall of Fame – Radical Convert: Narayana Murthy",
November 7, 1997
- 35 Business Barons, "Software Power", June 30, 1998
- 36 Onsite interviews conducted by the author at Bangalore in January 1999
- 37 Infosys Technologies Financial Reports



Infosys Technologies Limited (B)

"The addition of Infosys Technologies to the NASDAQ Stock Market will provide investors with a new opportunity to participate in the evolution of the world's information technologies industry. By trading on our market today, Infosys joins the ranks of some of the most innovative enterprises in the world, including 440 non-US companies," said Frank Zarb, Chairman and CEO of the National Association of Securities Dealers, Inc (NASDAQ).¹ Infosys Technologies Limited (ITL) launched its American Depository Receipt (ADR) offering on NASDAQ with much fanfare on March 11, 1999. The company offered 2.07 million ADRs representing 1,035,000 equity shares of the company at an offer price of \$34 each through its lead manager NationsBanc Montgomery Securities LLC.² Two ADRs could be exchanged for one equity share in Infosys (NASDAQ: INFY). The ADR opened at \$37.375 at 10:45 AM and rose to a high of \$50 before settling at \$46.875 at 4 PM when the markets closed. NR Narayana Murthy, ITL's Chief Executive Officer, was ecstatic. The ADR had appreciated almost 40% on its first day of trading, beyond his expectations. "The fact that the stock jumped to \$50 on the first day amid volumes nearly twice the issue size itself is an indicator of the interest from individual investors," a dealer in London said.³ "Of the 7,543 trades on the first day, 7,530 were non-bloc trades, which means there were these many retail trades as against institutional ones. Since the placement is thus in many hundreds of accounts, there is greater stability in this for the company," commented John Wall, President of NASDAQ International.⁴

Back in India, there was jubilation at the company headquarters as champagne bottles popped in celebration. On the Mumbai Stock Exchange (BSE), ITL shares hit an all time high of Rs. 3,457 (equivalent to an pre-bonus level of Rs. 6,914) before closing the day at Rs. 3,392⁵

(see Exhibit 1 for a record of Infosys stock prices since 1993.) In a glowing editorial, The Economic Times stated that it had now become customary in the software industry to expect success from Infosys (see Exhibit 2). This article also cautioned against being carried away by the euphoria and pointed out that India, and software companies within India, needed to do something to ensure the future sustainability of their strategic cost advantage. It then went on to propose that Indian companies needed to continue to become more globally oriented, and made a case for creating different centers with differing levels of infrastructure to meet the diverse demands of the global software industry.

In the months leading up to the ADR issue, and in the months immediately following it, Infosys had instituted many changes. Nandan Nilekani took over as President and COO of the company on February 10, 1999 (see Exhibit 3 for a revised organization chart). In a press release, the company stated, “This is in view of the various global initiatives that the company plans to take up in the coming months.”⁶ Murthy concentrated all his efforts on the globalization initiative. In the months that followed, he traveled to ITL offices around the world and discussed the best approach to expanding regionally within each market with members of his management team. ITL had also aggressively expanded its marketing and sales efforts and had added almost 50 new customers to its list. In April, it announced another record year, with profits more than doubling to Rs. 1.352 billion on revenues of Rs. 5.13 billion (see Exhibit 4 for financial results for Infosys’ 1999 fiscal year). Despite these results, the stock price fell by over 7% on the BSE. Analysts attributed this fall to the expectations of higher profits and some profit taking.⁷

Among the first actions that Nilekani and Murthy undertook upon assuming their new roles in the organization was to chart out guidelines for potential acquisition targets. They viewed acquisitions as one key way that Infosys could transform itself into a truly global organization and drew up a list of parameters to identify potential candidates for acquisition in the near future (see Exhibit 5). These guidelines stipulated that any potential acquisition should:

- Be operating in a niche area – not competing with larger product companies
- Have a high post-sale implementation and customization component
- Have an established base of around 200 to 300 customers with high retention potential
- Create synergy with Infosys’ existing services and have the potential to apply the offshore development model

The political situation in India was in turmoil again in spring 1999. The existing government, which was formed by a weak coalition of regional parties, had fallen apart and no single party was able to form a government to rule the country. In a move reminiscent of a few

years ago, the President had dissolved the parliament and ordered fresh elections for the fall of 1999. A caretaker government was appointed to rule through till the elections. All policies were frozen, and although the stock markets in India had taken a beating, they rebounded when the major parties involved in the election had vowed to keep economic reforms moving ahead at the pace set by their predecessors. Although businesses were always cautious, Infosys moved ahead in its globalization program with renewed optimism.

Murthy knew Infosys had a formidable task ahead of it if it was to make its globalization effort a success. By splitting the work between Nilekani and himself, he hoped to erode some of the firm's recent stock market losses. Analysts viewed the dual leadership role favorably, as it allowed focused concentration on the globalization program. The concerns expressed in the Economic Times editorial (i.e., regarding the sustainability of the cost advantage) remained in his mind, but he nonetheless wanted to move the company's expansion plans forward. He felt that increased costs could be more than offset by the added quality and value that they would provide their customers. Yet eroding margins would lead only to reduced profits, and the stock market had already demonstrated that it would not look favorably on such a move (as was evidenced by the decline in Infosys' stock price on the BSE in April.) With the ADR in place, Murthy knew that Infosys was responsible to an added group of shareholders and analysts located many miles away in the US. In a broadcast call to announce results to analysts and investors in the US market, Infosys' management was asked many questions on its future strategy. Although most analysts concurred that the outlook for the company looked good, some worried about the viability of the offshore delivery model and wondered what Infosys was doing to ensure a sustainable advantage over its competition.⁸

In May 1999, Infosys' board of directors assembled to take stock of the firm's situation and plan its future globalization strategy. Murthy, Nilekani, Raghavan, Dinesh, Gopalakrishnan, and Phaneesh Murthy - head of worldwide sales, among others, attended the meeting. The meeting began with an evaluation of the company's strengths and policies that had contributed to its success. Several key factors were identified (see Exhibit 6 for an exhaustive list of factors to which Infosys' success could be attributed):

- Infosys had an excellent management team comprising individuals with mutually exclusive yet complementary skills.
- The company had a knack for consistently attracting and retaining the best talent available due in a large part to its unique culture and management style.
- It had developed a clear vision and strategy that was closely monitored and adjusted as the situation warranted.
- All issues raised were transaction-based and oriented. Only valuable comments were respected and non-contributing members were not entertained. In fact, Infosys had recently

released two members of its board after it was determined that they were not contributing to the overall goals of the company.

Next followed a discussion of the major issues facing the company in the immediate future (Exhibit 7 lists these in greater detail). Would Infosys' past successes be an impediment to taking bold, riskier decisions in the future? How could Infosys balance its objectives of rapid growth and maintenance of a unique organizational culture? Would Infosys be able to balance the diverse needs of all its stakeholders in a manner that was acceptable to all? More important, was the expansion strategy it had pursued too aggressive? Should it scale back efforts now and focus on shoring up its existing expansion plans, or should it continue to forge ahead? Finally, how could Infosys continue to provide the business leadership much of the software industry in India had continued to expect from it and at the same time groom the next generation of leaders to take over the reins?

The meeting concluded with all members agreeing that although the company had achieved significant milestones in a few short years due to its clearly focused strategy, many of the real challenges were still to come. Both Murthy and Nilekani wondered what lay ahead for Infosys.

Exhibit 1

Historic Price Information of Infosys Stock on the Bombay Stock Exchange:

Date	Price (Rs.)	Market Cap. (Rs. million)
June 14, 1993	160	536
March 31, 1994	600	2,011
August 12, 1994 (bonus 2 for 1 announced)	1,250	4,190
March 31, 1995 (ex-bonus)	475	3,488
March 31, 1996	495	3,593
March 31, 1997	1,007	7,308
August 14, 1997 (bonus 2 for 1 announced)	2,193	15,918
March 31, 1998 (ex-bonus)	1,828	29,275
December 12, 1998 (bonus 2 for 1 announced)	2915	46,694
March 31, 1999 (ex-bonus)	2925	93,701

Source: Infosys Technologies Limited

Exhibit 2

THE ECONOMIC TIMES

March 12, 1999.

Editorial:

Well Deserved!

It is now almost customary in the software industry to expect success from Infosys Technologies; and becoming the first Indian company to be listed on Nasdaq was just another predictable step forward. But what must have surprised even the most experienced observers was the enthusiastic response the share received on the first day; reaching a peak of nearly 50 percent above the public offer price. It can now leverage this success to build a truly global presence. The emergence of Infosys as a global player is an example of what can be achieved by Indian business if it is willing to merge professionalism with vision. And in a social ethos where corporate heroes are still not fully recognized, Infosys deserves applause.

But there is a risk of being carried away by euphoria. It is convenient to assume that it is just a matter of time before other Indian companies follow the Infosys path. But if we look beyond the current major success stories of Indian software, there are some challenges that need to be overcome. Infosys has succeeded by producing where it is cheapest to produce and selling where it is most profitable to do so.

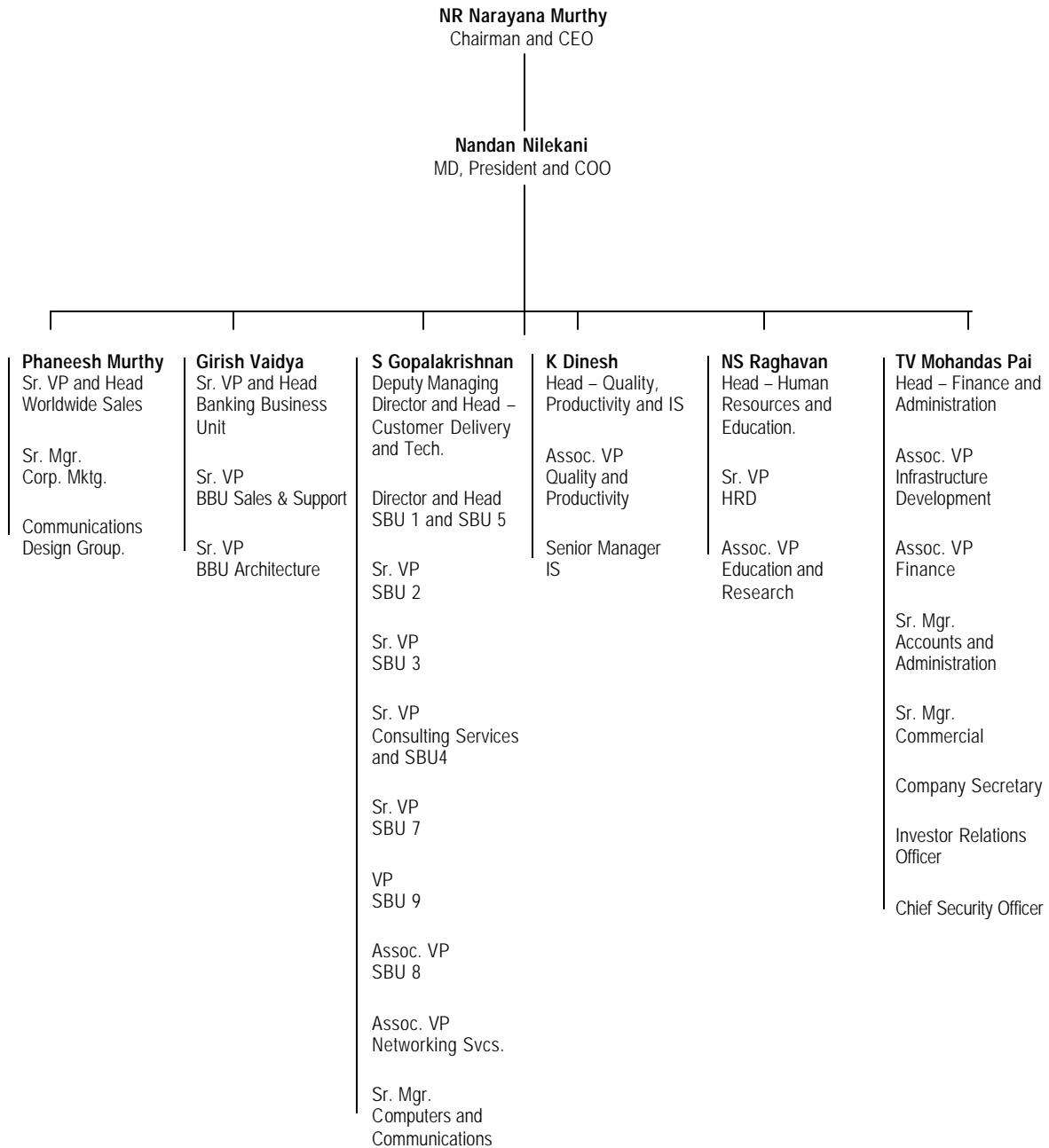
For this strategy to be replicated by others, India must remain one of the cheapest places to produce software in the world. This advantage could be threatened if in the process of developing infrastructure, the costs to the user are allowed to grow unchecked. One way out of this dilemma, of modernizing infrastructure versus keeping down costs of living and working, would be to recognize that costs are evaluated relative to the quality of work being done.

There would then be a case for creating different centres with differing levels of infrastructure to meet the diverse demands of global software. This would also help Indian cities attract different segments of global software investment rather than merely compete for the same business. The success of Infosys, and other software companies, is an indication of what can be achieved. But not necessarily of what will automatically happen.

Exhibit 3

Infosys Organization Chart

(As of August, 1999)



Source: Infosys Technologies Limited

Exhibit 4

Infosys Technologies Limited

Audited Financial Results for quarter, half year and fiscal year ended March 31, 1999.

All amounts in millions of Rupees

Particulars	Third quarter ended March 31,		Six months ended March 31,		Financial year ended March 31, 1999	Financial year ended March 31, 1998
	1999	1998	1999	1998		
Income from software development						
- overseas	1,479.5	769.5	2,857.8	1,480.1	5,002.5	2,509.4
- domestic	39.7	17.0	55.9	36.7	86.4	67.2
Other income	17.8	6.6	25.1	9.9	38.5	27.1
Total Income	1,537.0	793.1	2,938.8	1,526.7	5,127.4	2,603.7
Provision for contingencies	33.3	-	66.6	-	66.6	-
Provision for investment in subsidiary	-	-	35.3	-	70.6	-
Total Expenses	869.5	512.8	1,656.0	990.9	3,072.7	1,717.5
Profit before Interest, Depreciation and Taxes (PBIDT)	634.2	280.3	1,180.9	535.8	1,917.5	886.2
Interest	-	-	-	-	-	-
Depreciation	144.2	74.3	235.5	132.4	358.9	227.5
Profit before tax	490.0	206.0	945.4	403.4	1,558.6	658.7
Provision for tax	59.0	15.1	136.9	30.1	229.4	55.0
Profit after tax from ordinary activities	431.0	190.9	808.5	373.3	1,329.2	603.7
Extraordinary income (net of tax)	-	-	23.5	-	23.5	-
Net Profit	431.0	190.9	832.0	373.3	1,352.7	603.7
Paid up equity capital	330.7	160.2	330.7	160.2	330.7	160.2
Reserves	NA	NA	NA	NA	5,413.6	1,569.4

Source: Infosys Technologies Limited

Exhibit 5

Acquisition Guidelines

The following guidelines have been established for potential acquisition companies within our respective target market areas.

Product Companies

- Operating in a niche area – not competing with any large product companies
- Product has a high post sale implementation and customization component – the cost of customization and implementation is a high proportion of total cost
- Product costs around \$50,000 to \$150,000 per copy
- Sales must be through a direct selling model
- Should have an established base of around 200 – 300 customers
- Product should need migration to a contemporary platform/infusion of R&D efforts to keep it relevant and competitive
- There should be a high probability of retaining a large proportion of existing customers with an upgraded product
- There should be a high probability of cross-selling Infosys' existing products services to the acquired company's clients
- Product should have good potential for the future (with a constant infusion of a reasonable level of development effort)
- Product should be highly relevant to the US market place – for non-US based companies
- Additional suggestion – Product should be in our focused vertical segments (Distribution, Manufacturing, Telecom, Retailing, Financial Services, Transport, Utilities and Engineering)

Service Companies

- Should have a distinct focus in its work – operating in one of our focus vertical segments
- Should possess distinctive, useful IPRs (Intellectual Property Rights) in that line – processes, methodologies, etc.
- People – should have and be able to attract high caliber people
- Key personnel should be tied into the company for the long run – including in a post acquisition scenario
- There should be a synergy with existing Infosys services
- There should be a potential for applying the offshore development model

Source: Infosys Technologies Ltd.

Exhibit 6

Major Reasons for Infosys' Success

1. The ability to consistently attract and retain the best talent in the industry. Infosys does this with a series of policies that are aimed at ensuring all of their employees are empowered and compensated at a level unheard of in the Indian software industry.
2. The unique corporate culture and management style at Infosys. This has allowed the company to maintain an environment that encourages the free flow of ideas and information at all levels in the company.
3. Maintaining a clear vision and strategy. *"To be a globally respected software company that provides best-of-breed software solutions delivered by best-in-class people."*
4. The company maintains a distinct identity by doing some things differently than other companies in the same industry.
5. Infosys has diverse management talent with mutually exclusive yet complimentary skills. This ensures that every issue raised within the company has a champion who is an expert in that area and a number of extremely intelligent people who can assist him/her in analyzing that issue.
6. The company has responded with speed and imagination in ensuring that it maintains a leadership position in the industry. This has manifested itself in the company producing a history of "firsts" that were unheard of in Indian industry a few years ago.
7. Senior management has maintained an equitable mix between individual goals and corporate goals at all levels in the company.
8. The ability to accept that all problems that arise lie within the company and can be solved given the right level of expertise and internal talent.
9. The ability to keep all issues transaction based and oriented. All employees have the right to dissent and are welcome to fiercely debate any issue that is raised, but once a consensus is reached, they will work as a team in resolving the issue.
10. All members of the Infosys family must make value added contributions towards the company. If it is determined that any person is not contributing to the best interests of the company then that individual will no longer be accepted by the company, irrespective of his/her position within the company.

Source: Infosys Technologies Ltd.

Exhibit 6

Future Challenges for Infosys

1. Past history of successes could be an impediment for risky decisions that may need to be taken in the future.
2. How can the company manage its goal of rapid growth and maintain its unique balance of organizational culture?
3. How would it manage an organization of global employees given its limited experience in this area?
4. How does it continue to maintain its leadership as a growth company?
5. How does it continue to position itself as a truly unique company in the area of software development?
6. What organizational issues would the company need in place to position itself for aggressive growth?
7. With rapid growth, how can it ensure that our strong leadership is disbursed at all levels within the company?
8. How does it continue to provide the business leadership that the industry has come to expect from it?
9. What skills does it need to inculcate in its employees to ensure that it grooms the next generation of business leaders to take over from the current leadership?
10. What global business model would be most appropriate for Infosys' growth objectives into the future?
11. How can it ensure that it positions itself as being "close to the customer" when its business model requires it to often be a great distances from its customers?
12. As the company expands into being a global company, how does it maintain its small company culture and entrepreneurial spirit?
13. How would it create brand equity globally?
14. How would it motivate and empower employees from many different cultures while adhering to the "one company" model?
15. How can it improve the productivity of its personnel to increase profitability?
16. How sustainable is the existing offshore delivery model?

Source: Infosys Technologies Ltd.

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- ¹ Business Wire, "Infosys Technologies Limited lists on the NASDAQ Stock Market; First Indian Registered Direct Listing on a US Market", March 11, 1999
 - ² ITL Infosys offer document for 1.8 million American Depository Receipts, March 11, 1999
 - ³ The Economic Times, "INFY's still firm on Nasdaq, hits record high at home", March 12, 1999
 - ⁴ The Economic Times, "Infosys did better than other entrants on Day 1: John Wall", March 12, 1999
 - ⁵ The Times of India, "Arbitrage opportunity in Infosys scrip?" March 15, 1999
 - ⁶ Infosys Technologies Limited Press Release, February 10, 1999
 - ⁷ The Economic Times, "Infosys net profit doubles to Rs. 1,352.7 million in FY 99", April 9, 1999
 - ⁸ Highlights of Infosys conference call to announce results from the company website, April 9, 1999