



1945 - IBM'S FIRST RESEARCH LAB

IBM's first research facility, the Watson Scientific Computing Laboratory, opens in a renovated fraternity house near Columbia University in Manhattan. In 1961, IBM moves its research headquarters to the T.J. Watson Research Center in Yorktown Heights, New York. Today, IBM Research operates Laboratories in the United States, Switzerland, Israel, Japan, China and India.

1952 - FIRST CALIFORNIA RESEARCH LAB

IBM opens its first West Coast lab in San Jose, California - the area that decades later will come to be known as "Silicon Valley." Within four years, the lab begins to make its mark by inventing magnetic storage systems.

1956 - FIRST MAGNETIC HARD DISK

IBM introduces the world's first magnetic hard disk for data storage. RAMAC (or Random Access Method of Accounting and Control) offers unprecedented performance by permitting random access to any of the million characters distributed over both sides of 50 two-foot-diameter disks. Produced in San Jose, California, IBM's first hard disk stored about 2,000 bits of data per square inch and had a purchase price of about \$10,000 per megabyte. By 1997, the cost of storing a megabyte had dropped to around ten cents.

1956 - ZURICH LAB

IBM's Zurich Research Laboratory opens. In 1986 and 1987, researchers in this laboratory will earn back-to-back Nobel Prizes for physics - first for the invention of the scanning tunneling microscope, then for the breakthrough discovery of high-temperature superconductivity.

1957 - FORTRAN

IBM revolutionizes programming with the introduction of FORTRAN (Formula Translator). Created by John Backus, it soon becomes the most widely used computer programming language for technical work. For the first time, engineers and scientists can write computer programs in more natural forms, such as $C=A/B$ rather than as strings of "machine language: 1s and 0s.

1958 - SAGE

The SAGE (Semi-Automatic Ground Environment) computer is declared fully operational. Built under contract to MIT's Lincoln Laboratories for the North American Air Defense System, Sage was the first system to operate in real time.

1961 - T.J. WATSON RESEARCH CENTER

IBM moves its research headquarters from Manhattan to Westchester County, New York. The Thomas J. Watson Research Center, which now has laboratories in the Yorktown Heights and nearby Hawthorne is IBM's largest research facility. Research here is centers on semiconductors, computer science, physical science and mathematics.

1962 - SABRE

Two IBM 7090 mainframes form the backbone of the SABRE reservation system for American Airlines. As the first airline reservation system to work live over phones lines, SABRE links high speed computers and data communications to handle seat inventory and passenger records from terminals in more than 50 cities.

1964 - SYSTEM/360

The world of computing is forever changed when IBM debuts the first compatible family of computers in which software and peripherals work seamlessly. When introduced, the System/360 offers customers live processors and a variety of configurations for power, speed and memory.

1966 - ONE- TRANSISTOR MEMORY CELL

IBM scientist Bob Dennard invents one-transistor dynamic RAM (now known as DRAM) which permits major increases in memory density. In 1988, President Ronald Reagan presents Dennard with the National Medal of Technology. DRAM chips based on Dennard's invention still reign as a dominant form of computer memory.

1967 - FRACTALS

A scientist at IBM Research, Benoit B. Mandelbrot, published a paper in Science introducing fractal geometry - the concept that seemingly irregular natural shapes, such as the branching of trees, have the same form when viewed from close up or from far away. "The Mandelbrot Set," a fractal object discovered in 1980, has been described as the most complex - and possibility most beautiful - object ever seen in mathematics. In the 30 years since they were first identified, the study of fractals has brought new insight to a wide variety of fields, including mathematics, physics, earth sciences, economics and the arts.

1970 - RELATIONAL DATABASES

IBM scientist Ted Codd published a paper introducing the concept of relational databases. It calls for information stored within a computer to be arranged in easy-to-interpret tables so that nontechnical users can access and manage large amounts of data. Today as we approach the new millennium, nearly all database structures are based on the IBM concept of relational databases.

1971 - SPEECH RECOGNITION

IBM achieves its first operational application of speech recognition, which enables engineers servicing equipment to talk to, and receive spoken answers from a computer that can recognize about 5,000 words. Today, IBM's ViaVoice voice recognition technology has a vocabulary of 64,000 words and 260,000-word back-up dictionary. In 1997 ViaVoice products are introduced in China and Japan. Highly customized VoiceType products are also available specifically for people working in the fields of emergency medicine, journalism, law and radiology.

1972 - HAIFA RESEARCH LABORATORY

IBM established a science center in Haifa, Israel. Today, nearly 250 scientists and engineers at the Haifa Research Laboratory focus on a wide range of research areas, including operating system, distributed computing, systems availability, computer communication, computing languages, multimedia, physical and logic design, and mathematical models and applications.

1979 - THIN FILM RECORDING HEADS

Instead of using hand-wound wire structures as coils for inductive elements, IBM researchers substitute thin film "wires" patterned by optical lithography. This leads to higherperformance recording heads at reduced cost, and establishes IBM's leadership in "areal density" - storing the most data in the least space. The result is higher-capacity and higher-performance disk drives.

1980 - RISC ARCHITECTURE

IBM successfully builds the first prototype computer employing RISC (Reduced Instruction Set Computer) architecture. Based on an invention by IBM scientist John Cocke in the early 1970's, the RISC concept simplified the instructions given to run computers, making them faster and more powerful. Today, RISC architecture is the basis of most workstations and is widely viewed as the dominant computing architecture of the future.

1981 - SCANNING TUNNELING MICROSCOPE

Two scientists from the IBM Zurich Research Laboratory, Gerd K. Binnig and Heinrich Rohrer, invent the Scanning Tunneling Microscope, which provides a first-ever look at the topography of surfaces in an atom-by-atom format. IN 1986, Binnig and Rohrer are awarded the Nobel Prize in physics for their accomplishment.

1982 - TOKYO RESEARCH LABORATORY

The Tokyo Research Laboratory opens its doors. Today more than 250 people at IBM's Tokyo Lab are working on research in the fields of computer science, storage and semiconductor technology, and manufacturing.

1982 - TRELLIS-CODED MODULATION

Soon after its invention at the Zurich Research Laboratory, trellis-coded modulation (TCM) is first used in voiceband modems to send data at higher rates over telephone channels. Today, TCM is applied in a large variety of terrestrial and satellite-based transmission systems as a key technique for achieving faster and/or more reliable digital transmission.

1985 - TOKEN RING NETWORK

Token Ring technology, developed by the IBM Zurich Research Laboratory, brings a new level of control to local area networks and quickly becomes an industry standard for LAN's helping to connect local printers, workstations and servers.

1986 - ALMADEN RESEARCH CENTER

IBM Research dedicates the Almaden Research Center - the successor to the San Jose Research Laboratory which was established in 1952. Today, Almaden is IBM's second-largest laboratory. Its primary focus areas include storage systems, technology, and computer science.

1986 - HIGH TEMPERATURE SUPERCONDUCTIVITY

Two scientists from the IBM Zurich Research Laboratory, J. Georg Bednorz and K. Alex Muller, discover superconductivity in ceramic oxides that carry electricity without loss of energy at much higher temperatures than any other superconductor. The discovery sparks a worldwide effort focusing on applications of high-temperature superconductors to such areas as power generate, microwave applications and sensors. One year later, Bednorz and Muller are awarded the Nobel Prize in physics for their discovery.

1989 - SILICON GERMANIUM TRANSISTORS

By replacing more expensive and exotic materials like gallium arsenide with silicon germanium (known as SiGe), IBM creates faster chips at lower costs. Introducing germanium into the baselayer of an otherwise all-silicon bipolar transistor allows for significant improvements in operating frequency, current, noise and power capabilities. In 1995, IBM commercializes its

silicon germanium chips through partnerships with companies in the emerging telecommunications market. Hughes and NORTEL are among the first to participate.

1992 – THINKPAD

IBM introduces a new line of notebook computers. Housed in a distinctive black case and featuring the TrackPoint (an innovative pointing device nestled in the middle of the keyboard), the ThinkPad is an immediate hit and goes on to collect more than 300 awards for design and quality.

1993 - SCALABLE PARALLEL SYSTEMS

IBM pioneers the technology of joining multiple computer processors and breaking down complex, data-intensive jobs to speed their completion. Deep Blue - the chessplaying computer that in 1997 defeats World Class Champion Garry Kasparov - used this technology. It is also used in weather prediction, oil exploration and manufacturing.

1994 - PRIZMA SWITCH

IBM ships its first ATM switch for corporate customers. Based on the PRIZMA switching technology developed by IBM Research, the outstanding scalability of PRIZMA enables IBM to ship products that support dramatically increased throughputs.

1995 - CHINA RESEARCH LAB

IBM Research established the China Research Laboratory in Beijing. The lab is formed to focus initially on creating software and applications that are especially relevant to China. Examples include digital libraries speech recognition for Mandarin, machine translation, Chinese language processing, multimedia and the Internet.

1996 - AUSTIN RESEARCH LAB OPENS

Based in Austin, Texas, the lab is focused on advanced circuit design, as well as new design techniques and tools for very high performance microprocessors.

1997 - DEEP BLUE

The 32-node IBM RS/6000 SP supercomputer, Deep Blue, defeated World Chess Champion Garry Kasparov in the first known instance of a computer vanquishing a world champion chess player in tournament-style competition. Also after years of teamwork among Research and Microelectronics divisions, IBM introduced the CMOS 7S process, which allowed manufacturers use copper wires to link transistors in computer chips instead of relying on traditional aluminum interconnects; a revolutionary advance in semiconductor technology.

1998 – CMOS

A 15-person design team at the IBM Austin Research Laboratory announced the first ever CMOS microprocessor that ran at 1 billion cycles per second. IBM scientists developed new silicon-on-insulator chip to be used in the construction of a mainstream processor, and signaled that the advance would soon reach the market in new circuit designs and product groups.

1998 - INDIA RESEARCH LABORATORY OPENS

Just a few short years later, nearly seventy researchers are working in a variety of research areas, including e-commerce, media mining, fingerprint matching, speech recognition, weather forecasting and wireless networks.

IBM History Highlights

1890 - The U.S. Census Bureau adopts the Hollerith Punch Card, Tabulating Machine and Sorter to compile results of the 1890 census, reducing an almost 10-year process to 2 ½ years, saving the government a whopping \$5 million. Inventor Herman Hollerith, a Census Bureau statistician, forms the Tabulating Machine Company in 1896.

1911 - The Tabulating Machine Company merges with the International Time Recording Co. And Computing Scale Co. Of America to become the Computing-Tabulating-Recording Co. Based in New York City, the company employs 1,300.

1924 - C-T-R changes its name to International Business Machines Corp. In a letter to employees, company president T.J. Watson writes: "Our new name is particularly adaptable and suitable to our business, in view of our increasing growth, the constant development of additions to our line, and our products covering such a wide range in the field of business machinery."

1944 - MARK I COMPUTER. IBM introduces the world's first large-scale calculating computer. Designed in collaboration with Harvard University, the Mark I (or Automatic Sequence Controlled Calculator) uses electromechanical relays to solve addition problems in less than a second, multiplication in six seconds, and division in 12 seconds.



Infosys Technologies Ltd. is a software development company with headquarters in Electronics City, Bangalore, India, an area known as 'India's Silicon Valley' for its concentration of high-tech multinational and Indian companies. Co-founded by Chairman and CEO N.R. Narayana Murthy, Infosys Technologies has accomplished a number of firsts for an Indian company, including becoming the first to be listed on an American stock exchange and the first to offer an employee stock option plan (ESOP). About 500 employees have become millionaires as a result of the company's ESOP. In 2000 the firm's international client base included 200 American firms, for which Infosys Technologies provided software for enterprise resource planning (ERP), Y2K compliance, electronic commerce, and other applications.

1981 - Infosys Technologies Ltd. is founded in Bangalore, India, by N.R. Narayana Murthy and seven other software engineers.

1987 - Infosys opens its first U.S. office.

1992 - Infosys becomes a public limited company in India.

1993 - Company issues stock through public offerings on three stock exchanges in India.

1999 - Infosys becomes the first India-based public company to be listed on an American stock exchange, the NASDAQ.

Early History: 1980s

Infosys Technologies Ltd. was founded in 1981 in Bangalore, India, by N.R. Narayana Murthy and seven other software engineers with a combined investment of about \$1,000. One of eight children of an Indian village official, Murthy would emerge as the company's chairman and CEO. He became regarded as the most highly esteemed manager in India, due in part to his mathematical abilities and Western style of management. The company opened its first international office in the United States in 1987.

Favorable Business Climate: 1990s

Following a series of economic reforms in India in 1991, Infosys Technologies began to grow more rapidly. It became a public limited company in 1992, with an initial public offering (IPO) on three of nine Indian stock exchanges to follow in 1993. In 1993 it received ISO 9001/TickIT Certification, and in 1995 it established development centers across India.

By mid-1995 the firm had 900 employees and was worth \$120 million, with about \$20 million in annual revenue. In addition to its 400,000-square-foot facilities in Bangalore, the firm had offices in Boston, New York, and Maastricht in the Netherlands. In 1996 it established its European headquarters in the United Kingdom. Its main facility featured more than 1,000 networked workstations for use in creating software. The company had written the reservation system for Holiday Inns in the United States. Other customers included Reebok International, Nestlé S.A., and AT & T.

Infosys established headquarters in what has been called 'India's Silicon Valley' because of its concentration of more than 100 foreign and domestic companies. The firm's main software development centers were in the southern Indian city of Bangalore in an area called Electronics City. Other high-tech companies with facilities there included Siemens and Hewlett-Packard. Such companies were attracted by the fact that none of the firms' workforces had to be unionized, software exports were not taxed in India, benefits were a relatively minor cost, and the profit potential was enormous. These cost-savings were first recognized by American multinationals in the 1980s.

India was able to provide these firms with highly trained computer programmers and software engineers. About 15,000 computer science majors graduated from universities in India every year. The Indian Institute of Science in Bangalore was equipped with the most advanced technology, and the government supported the university system by providing millions of dollars for training.

Exponential Growth: Late 1990s

For fiscal 1998 ending March 31, Infosys Technologies reported net revenue of \$68.33 million, a 73 percent increase over fiscal 1997. The company's growth was fueled by its offshore software development model and the branding of some of its services. Infosys Technologies offered its clients an offshore model, whereby the company would replicate the systems and infrastructure of its international clients in India. During fiscal 1998 the firm's market capitalization rose to about \$770 million from \$192 million at the end of 1997.

Four marketing offices were opened during fiscal 1998, including two in the United States and one each in Canada and Japan. The company had a total of 12 marketing offices, eight in the United States and four in other countries. During the year, the company gained 40 new clients. More than 70 percent of the company's revenue came from repeat business.

Initiatives launched during the year included offerings for engineering services, Internet and intranet solutions, and Enterprise Package Solutions. The company was also addressing Euro conversion issues. Technical staff increased during the year to 2,186 from 1,396 at the end of fiscal 1997. Total employees increased to 2,622 from 1,701.

The company expanded the decentralized development of software by commissioning the Infosys Towers facility at J.P. Nagar, Bangalore, during fiscal 1998. The development centers at Pune, Bhubaneswar, and Chennai were also expanded. The company also began construction on Infosys Park at Electronics City, Bangalore, to be completed by December 1999.

It was during fiscal 1998 that Infosys Technologies become one of some 20 companies in the world to reach Level 4 of the Capability Maturity Model (CMM) of the Software Engineering Institute (SEI) at Carnegie Mellon University. The certification covered fixed-price software development, maintenance, and re-engineering processes, which together contributed about 90 percent of the company's revenue. Obtaining the certification reflected the firm's commitment to meeting international quality standards.

In October 1998 Infosys Technologies held its third annual customer conference. The company used the conference to disseminate its best practices across its client base and to enhance the power of its global delivery model. Nearly 60 client representatives participated in this year's conference. The company stressed long-term relationships with its clients. In 1999 repeat business accounted for 90 percent of revenue, up from 83 percent in 1998.

The company's principal source of revenue, on a geographic basis, was North America, which accounted for 82 percent of revenue in both 1998 and 1999. Europe accounted for eight percent in both years, and India, approximately three percent. The rest of the world accounted for the remainder. During 1999 the company opened an office in Seattle and shifted a European office from Maastricht in the Netherlands to Frankfurt, Germany, giving it 13 marketing offices outside India, including nine in the United States.

That same year Infosys Technologies expanded the range of its services and was becoming a full service partner to its clients. Projects the company worked on included ERP projects, a loyalty management package utilizing Microsoft technologies, and a system and security architecture consulting study. Its Internet consulting and development group designed and built high-performance and secure infrastructure for electronic commerce. During fiscal 1999 Infosys Technologies added 39 new clients, including The Boeing Company, Paradyne Corporation, and AMP Inc.

Infosys Technologies was listed on the NASDAQ stock exchange on March 11, 1999. It was the first India registered company to become listed on an American stock exchange. Listing on the NASDAQ enabled Infosys Technologies to institute an employee stock option plan through the use of American Depository Receipts (ADRs), each of which was worth half a share. By mid-2000 the company had issued 4.16 million ADRs.

Moreover, listing on the NASDAQ was expected to help the company raise money to finance its drive to become a global company, grow through acquisitions, and enhance its image. It would help the company attract a high-quality workforce by offering employee stock options. Infosys Technologies had been hiring 800 to 900 new employees per year. The IPO raised \$70 million, and in the months following the IPO the company's stock price rose 20 percent. According to Business Week, the company gained \$1 billion in market capitalization on its first day on the NASDAQ. By the end of 1999 the stock was trading at \$290 per share, a 15-fold increase over the IPO price.

At the beginning of 1999, most of the company's growth was expected to come from developing customized software. The company was also getting into Internet and intranet applications, enterprise resource planning (ERP) software, electronic commerce, and Euro conversion software.

During fiscal 1999 the company attained SEI CMM Level 5, the highest level assessed by the SEI for quality. It continued to build up its infrastructure by completing its new facility, Infosys Park, at Electronics City, Bangalore, which could accommodate up to 2,000 software and support personnel. At the beginning of 1999 it began construction of a new software development facility at Pune Infotech Park, Hinjawadi, Pune. The first phase of this facility would have capacity for 1,200 professionals. The company also opened offices in Germany, Sweden, Belgium, and Australia.

In mid-1999 an integrated extranet developed by Infosys Technologies for longtime outsourcing partner Nordstrom Inc. went online. It used a Windows NT software application that enabled the Nordstrom Product Group to combine 20 spreadsheet applications into an integrated applications environment of databases linked over the Internet.

Other repeat business came from the firm's Y2K work. For example, Infosys Technologies had performed Y2K compliance work for insurer Aetna Inc. during 1999, using about 50 software programmers and engineers. At the beginning of 2000 Aetna contracted for an additional 300 Infosys employees to develop its electronic commerce initiatives in the areas of global healthcare and financial services. Using the Infosys offshore model, Aetna worked with the firm's U.S. office, which in turn conveyed information to programmers in India.

Infosys's Global Delivery Model enabled it to develop software collaboratively in different geographic locations. For example, a project's requirements might be outlined in the client's New York offices, with software development done in

Bangalore, and deployment anywhere in the world. The time differences associated with different parts of the world enabled Infosys Technologies to provide 24-hour productive days and problem-solving.

As of February 2000 the company had a market capitalization of more than \$20 billion. For fiscal 2000 ending March 31, Infosys Technologies reported revenue of \$203.44 million, compared to \$120.96 million in 1999, an increase of 68 percent. Net income rose from \$17.45 million in fiscal 1999 to \$61.34 million in fiscal 2000. A statement from CEO N.R. Narayana Murthy noted, 'Demand for e-commerce services, an area where the company has a proven track record, continues to drive our revenue growth.'

During fiscal 2000 Infosys Technologies made its first strategic investment in a leading-edge technology company, committing \$3 million to Massachusetts-based EC Cubed, Inc., an application provider for business-to-business electronic commerce.

The company reported a net profit of \$28.4 million in the first quarter ending June 30, 2000, compared to \$13.6 million for the same period in 1999. Overall revenue rose to \$83 million, compared to \$48.2 million in 1999. These results exceeded analysts' expectations. One analyst predicted the company's profits would double in the next two quarters, due to surging exports, higher priced services, and a larger proportion of high-margin e-commerce work.

For the quarter ending June 30, 2000, Infosys said that e-commerce work made up nearly 29 percent of its total revenues, or \$22.6 million, compared to nearly 19 percent in the quarter ending March 31, 2000, and 6.4 percent in the same quarter in 1999.

During the first quarter of fiscal 2001 Infosys Technologies increased its workforce by nearly 20 percent to 6,446 employees. The company was expected to grow to more than 7,500 employees by the end of fiscal 2001 (March 31, 2001). In issuing a 'buy' rating, Merrill Lynch noted that many of Infosys Technologies' customers had asked the firm to increase its 'team size' by 80 to 100 percent over the next year.

In August 2000 Infosys Technologies opened an office in Hong Kong to take advantage of the e-commerce activity there, especially in business-to-business applications. One analyst estimated that the Asia Pacific region would account for nearly 20 percent of global business-to-consumer and business-to-business electronic commerce by 2003. Opening the office was part of Infosys Technologies' strategy to expand its e-commerce business from the United States and Europe into the Asia Pacific region. Its clients have included Amazon.com, Blue Martini, Cephren, Cisco Systems, Dell Online (Japan), EC Cubed, preis24.com, and SAPMarkets.



Tata Consultancy Services was established in 1968. It started off as a division of the Tata Group, Tata Computer Centre, whose main business was to provide computer services to other group companies. However, the potential of computerization and computer services was realized early on, and an electrical engineer from the Tata Electric Companies, Fakir Chand Kohli, was brought in as the first General Manager.

Soon after, the company was named Tata Consultancy Services. It started in India in 1968.

TCS's first software export project was undertaken in 1974 when it converted the Hospital Information System from Burroughs Medium Systems COBOL to Burroughs Small Systems COBOL. This project was carried out entirely in TCS Mumbai on the ICL 1903 Computer. A team of more than 12 people delivered this project to their first US based customer, and thus the Indian Software Export Industry was born. By mid 1970s it had spread its reach to Britain, Switzerland and the Netherlands. In 1979, TCS was the first Indian software firm to open overseas office in New York.[2]

In 1980, TCS and a sister Tata firm accounted for 63% of the Indian software industry exports, \$4 million shared by 21 firms. New players like Datamatics, Patni Computer Systems started to evolve in 1980's. In 1984, TCS set up an office in the Santacruz Export Processing Zone (SEEPZ) – Mumbai.

The early 1990s saw a tremendous surge in TCS's business, which also resulted in a massive recruitment drive by the company. In early and mid-1990s, TCS re-invented itself to become a software products company. In the late 1990s, to accelerate its revenue growth, TCS decided to employ a three-pronged strategy – developing new products with high revenue earning potential, tapping domestic and other fast growing markets and focusing on inorganic growth through mergers & acquisitions. In late 1998, the company decided to concentrate on new revenue opportunities including Y2K and Euro conversion. E-business was a major area of focus in the late 1990s.

TCS started a project aimed at removing illiteracy in India with a pilot project in Andhra Pradesh. In 2001, Tata Consultancy Services (TCS) commissioned the latest 64-bit zSeries eServer from IBM, thereby becoming the first organization in the ASEAN and South Asia region to adopt the latest technology in mainframe computing. In 2004, TCS became a public listed company. In fiscal 2006 the Company's profit before taxes and exceptional items aggregated Rs. 3,074.35 crore as compared to Rs. 2,308.65 crore in the previous fiscal 2005 - a growth of 33.17%. In 2006, Tata Infotech Limited and three wholly-owned subsidiaries of the company, namely Airline Financial Support Services (India) Ltd (AFSL), Aviation Software Development Consultancy India Ltd (ASDC) and TCS Business Transformation Solutions Ltd (TCS BTS) have amalgamated with the company.



Cognizant started in 1994, as Dun & Bradstreet Satyam Software - the in-house technology development center for the Dun & Bradstreet Corporation (D&B) and its operating units. Initially a joint venture between Dun & Bradstreet (76%) and Satyam Computer Services Ltd. (24%), it soon became a 100% subsidiary of D&B Corp. In 1996, the company became a division of the Cognizant Corporation, after the split-up of Dun & Bradstreet Corporation.

In June 1998, Cognizant Corporation was again split into independent companies, and Cognizant Technology Solutions was formed as a division of IMS Health, a provider of information solutions to the pharmaceutical and healthcare industries. The same year, the company completed its initial public offering and was listed on the NASDAQ. In November 2002, IMS Health divested its majority interest in Cognizant through a tax-free split-off.'

Operations

Although it is headquartered in New Jersey, USA, most of Cognizant Technology Solutions employees are based in the city of Chennai, Tamil Nadu. It also has offices in Bangalore, Coimbatore, Hyderabad, Kolkata, Mumbai, Pune and Cochin and development centres in Shanghai, China and Amsterdam. Cognizant has over 45,000 employees. It became first company in the world to be certified for CMMI-Level5 as per latest model.

Cognizant has aligned its businesses vertically and has clients in Banking & Financial Services, Healthcare, Manufacturing & Logistics, Information, Media & Entertainment, Telecommunications, Insurance, Life Sciences, Retail, Hospitality, New Technology.

In addition to vertical focus, Cognizant also provides specialty technology services through its horizontal expertise such as Data Warehousing and Business Intelligence, CRM, ERP, BPO etc.



Satyam Computer Services Ltd is one of the leading global consulting and IT services company that offers end-to-end IT solutions for a range of key verticals and horizontals. Satyam Computers has domain expertise in verticals such as Automotive, Banking & Financial Service, Insurance & Healthcare, Manufacturing, Telecom, Infrastructure, Media, Entertainment, and Semiconductors.

Satyam has nearly 40,000 employees on its rolls, working in development centers in India, the USA, the UK, the UAE, Canada, Hungary, Singapore, Malaysia, China, Japan and Australia. Satyam Computers' network is spread over 55 countries across 6 continents. Satyam serves over 558 global companies including over 163 Fortune 500 corporations.

Satyam Computers was founded in June 1977 as a private limited company by Ramalinga Raju along with one of his brothers-in-law, DVS Raju. In June 1991, Satyam Computers got its first Fortune 500 Client. In the same year in August, Satyam Computers was recognized as a Public Limited Company. Satyam went public in May 1992 and its issue was oversubscribed 17 times. In July 1993, Satyam entered into a joint venture with Dun & Bradstreet. Satyam was awarded ISO 9001 Certification in March 1995. In December 1995, Satyam Infoway was incorporated. In May 1997, Satyam became the first Indian IT Company to get ITAA Certification for Y2K Solutions. In November 1998, Satyam became one of the first companies to enter Indian Internet service market with the launch of Satyam Infoway's ISP Service. In the same year Satyam entered into a joint venture with GE. In 1999, Satyam Infoway became the first Indian Internet company to be listed on NASDAQ. In February 2000 Satyam was declared one of '100 Most Pioneering Technology Companies' by World Economic Forum, Davos. In May 2000 Satyam became

the first organization in the world to launch Customer-Oriented Global Organization training. In March 2001 Satyam became first ISO 9001:2000 Company in the world as certified by BVQI. In May 2001 Satyam was listed on New York Stock Exchange. In 2003, Satyam announced business continuity center in Singapore, the first of its kind outside India. In 2004, Satyam opened new development center in Mississauga, Canada. In 2005 Satyam acquired 100% stake in Singapore based Knowledge Dynamics, a leading Data Warehousing and Business Intelligence solutions provider.

Achievements of Satyam Computers:

First Indian IT Company to get ITAA Certification for Y2K Solutions.

Satyam Infoway is the first Indian Internet company to be listed on NASDAQ.

Declared one of '100 Most Pioneering Technology Companies' by World Economic Forum, Davos in the year 2000.

First organization in the world to launch Customer-Oriented Global Organization training.

First ISO 9001:2000 Company in the world as certified by BVQI.

Ranked by the Brown-Wilson Group as the number two outsourcing vendor globally in the year 2006.



Patni Computer Systems Ltd., is a provider of Information Technology services and business solutions. The company employs over 14,000 people, and has 23 international offices across the Americas, Europe and Asia-Pacific, as well as offshore development centers in 8 cities in India. Patni's clients include more than 200 Fortune 1000 companies. Patni has registered revenues of US\$ 568 million for the year 2006.

Patni Computer Systems Limited was incorporated as Patni Computer Systems Private Limited on February 10, 1978 under the Companies Act, 1956. In 1988, by virtue of Section 43A of the Companies Act, the Company became a "deemed public company" and subsequently on April 15, 1991 it was then converted into a private limited company. By virtue of its turnover exceeding prescribed limits under the then-applicable Section 43A of the Companies Act, on July 1, 1995, the Company became a deemed public company and consequent to the deletion of Section 43A from the Companies Act, 1956, the Company was converted to a private limited company on June 27, 2002. The Company was again converted to a public limited company on September 18, 2003.

In 2004, Patni came out with an initial public offering (IPO) of 18,724,000 equity shares in the price of Rs 230 per share for a face value of Rs 2 each. In the same year, Patni acquired Fremont, California based Cymbal Corporation for a sum of US\$78 mn. Cymbal's acquisition allowed Patni to enter \$60 billion IT services market in the telecom vertical which was previously not available to Patni on their business landscape. This acquisition also allowed Patni to spread its Non-GE Business, and added a development center in Hyderabad, India.

In December 2005, Patni listed its ADRs on the New York Stock Exchange (NYSE) under the ticker PTI.

In 2007, a US Department of Labor investigation of Patni found that the company had defrauded 607 H1-B employees in the US of mandatory wages between January 2004 and December 2005. A \$2.4 million levy was issued against Patni to settle this violation of US labor laws. DOL regulations stipulate that employers must pay non-immigrant H-1B visa holders "at least the local prevailing wage or the employer's actual wage, whichever is higher." [citation needed] This provision is intended to guard against employers undercutting American workers by underpaying temporary foreign workers. illegally underpaid its H1-B employees in the US.

Board of Directors

Narendra K Patni - Chairman & CEO

Gajendra K Patni - Executive Director

Ashok K Patni - Executive Director

William O Grabe - Director

Louis Theodoor van den Boog - Independent Director

Michael A Cusumano - Independent Director

Arun Duggal - Independent Director

Arun Maira - Additional Director

Pradip Shah - Independent Director

Ramesh Venkateswaran - Independent Director

Abhay Havaladar - Alternate Director to Mr. William O Grabe

Key Industries

Insurance, Financial Services, Manufacturing, Telecom & ISV, Media & Entertainment, Energy & Utilities, Logistics & Transportation



Pre-foundation

Before Steve Wozniak co-founded Apple, he was an electronics hacker. By 1975, he was working at Hewlett-Packard and helping his friend Steve Jobs design video games for Atari. Wozniak had been buying computer time on a variety of minicomputers hosted by Call Computer, a time-sharing firm run by Alex Kamradt. The computer terminals available at that time were primarily paper-based; thermal printers like the Texas Instruments Silent 700 were state of the art. Wozniak had seen a 1975 issue of Popular Electronics magazine on how to build your own computer terminal. Using off-the-shelf parts, Wozniak designed the Computer Conversor, a 24-line by 40-column, uppercase-only video teletype that he could use to log on to the minicomputers at Call Computer. Alex Kamradt commissioned the design and sold a small number of them through his firm.

Aside from their interest in up-to-date technology, the impetus for "the two Steves" seems to have had another source. In his essay *From Satori to Silicon Valley* (published 1986), cultural historian Theodore Roszak made the point that the Apple Computer emerged from within the West Coast counterculture and the need to produce print-outs, letter labels, and databases. Roszak offers a bit of background on the development of the two Steves' prototype models.

On June 12, 2005 at Stanford University's 2005 Commencement Address Jobs said, "When I was young, there was an amazing publication called *The Whole Earth Catalog*, which was one of the bibles of my generation. It was created by a fellow named Stewart Brand not far from here in Menlo Park, and he brought it to life with his poetic touch. This was in the late 1960s, before personal computers and desktop publishing, so it was all made with typewriters, scissors, and polaroid cameras. It was sort of like Google in paperback form, 35 years before Google came along: it was idealistic, and overflowing with neat tools and great notions."

In 1975, Wozniak started attending meetings of the Homebrew Computer Club. New microcomputers such as the Altair 8800 and the IMSAI inspired him to build a microprocessor into his video teletype and have a complete computer.

At the time the only microcomputer CPUs generally available were the \$179 Intel 8080, and the \$170 Motorola 6800. Wozniak preferred the 6800, but both were out of his price range. So he watched, and learned, and designed computers on paper, waiting for the day he could afford a CPU.

When MOS Technology released its \$20 6502 chip in 1976, Wozniak wrote a version of BASIC for it, then began to design a computer for it to run on. The 6502 was designed by the same people who designed the 6800, as many in Silicon Valley left employers to form their own companies. Wozniak's earlier 6800 paper-computer needed only minor changes to run on the new chip.

Wozniak completed the machine and took it to Homebrew Computer Club meetings to show it off. At the meeting, Wozniak met his old friend Jobs, who was interested in the commercial potential of the small hobby machines.

The Apple I

The very first Apple Computer logo, drawn by Ronald Wayne, depicts Isaac Newton under an apple tree. Original corporate Apple logo, created by Rob Janoff; used 1976 to 1998. Main article: Apple I
Steve Jobs and Steve Wozniak ("the two Steves") had been friends for some time, having met in 1971, when their mutual friend, Bill Fernandez, introduced 21-year-old Wozniak to 16-year-old Jobs. Jobs managed to interest Wozniak in assembling a machine and selling it.

Jobs approached a local computer store, The Byte Shop, who said they would be interested in the machine, but only if it came fully assembled. The owner, Paul Terrell, went further, saying he would order 50 of the machines and pay \$666.66 each on delivery. Jobs then took the purchase order that he had been given from the Byte Shop to Cramer Electronics, a national electronic parts distributor, and ordered the components he needed to assemble the Apple I Computer. The local credit manager asked Jobs how he was going to pay for the parts and he replied, "I have this purchase order from the Byte Shop chain of computer stores for 50 of my computers and the payment terms are COD. If you give me the parts on a net 30 day terms I can build and deliver the computers in that time frame, collect my money from Terrell at the Byte Shop and pay you.

With that, the credit manager called Paul Terrell who was attending an IEEE computer conference at Asilomar in Pacific Grove and verified the validity of the purchase order. Amazed at the tenacity of Jobs, Terrell assured the credit manager if the computers showed up in his stores Jobs would be paid and would have more than enough money to pay for the parts order. The two Steves and their small crew spent day and night building and testing the computers and delivered to Terrell on time to pay his suppliers and have a tidy profit left over for their celebration and next order. Steve Jobs had found a way to finance his soon-to-be multimillion-dollar company without giving away one share of stock or ownership.

The machine had only a few notable features. One was the use of a TV as the display system, whereas many machines had no display at all. This was not like the displays of later machines, however; text was displayed at a terribly slow 60 characters per second. However, this was still faster than the teletypes used on contemporary machines of that era. The Apple I also included bootstrap code on ROM, which made it easier to start up. Finally, at the insistence of Paul Terrell, Wozniak also designed a cassette interface for loading and saving programs, at the then-rapid pace of 1200 bit/s. Although the machine was fairly simple, it was nevertheless a masterpiece of design, using far fewer parts than anything in its class, and quickly earning Wozniak a reputation as a master designer.

Joined by another friend, Ronald Wayne, the three started to build the machines. Using a variety of methods, including borrowing space from friends and family, selling various prized items (like calculators and a VW bus) and scrounging, Jobs managed to secure the parts needed while Wozniak and Wayne assembled them. They were delivered in June, and as promised, they were paid on delivery. Eventually 200 of the Apple I's were built.

The Apple II

But Wozniak had already moved on from the Apple I. Many of the design features of the I were due to the limited amount of money they had to construct the prototype, but with the income from the sales he was able to start construction of a greatly improved machine, the Apple II; it was presented to the public at the first West Coast Computer Faire on April 16 and April 17, 1977. On the first day of exhibition, Jobs introduced Apple II to a Japanese textile technician named Mizushima Satoshi who became the first authorized Apple dealer in Japan.

The main difference internally was a completely redesigned TV interface, which held the display in memory. Now not only useful for simple text display, the Apple II included graphics, and, eventually, colour. Jobs meanwhile pressed for a much improved case and keyboard, with the idea that the machine should be complete and ready to run out of the box. This was almost the case for the Apple I machines sold to The Byte Shop, but one still needed to plug various parts together and type in the code to run BASIC.

Building such a machine was going to cost a lot more money. Jobs started looking for cash, but Wayne was somewhat gun shy due to a failed venture four years earlier, and eventually dropped out of the company. Banks were reluctant to lend Jobs money; the idea of a computer for ordinary people seemed absurd at the time. Jobs eventually met "Mike" Markkula who co-signed a bank loan for \$250,000, and the three formed Apple Computer on April 1, 1976. Why Apple? At the time, the company to beat was Atari, and Apple Computer came before Atari alphabetically and thus also in the phone book.

With both cash and a new case design in hand, the Apple II was released in 1977 and became the computer generally credited with creating the home computer market. Millions were sold well into the 1980s. A number of different models of the Apple II series were built, including the Apple IIe and Apple IIGS, which could still be found in many schools as late as 2005.

The Apple IPO

In December 1980, Apple launched the Initial Public Offering of its stock to the investing public. When Apple went public, it generated more money than any IPO since Ford Motor Company in 1956 and instantly created more millionaires (about 300) than any company in history. Several venture capitalists cashed out, reaping billions in long-term capital gains.

In January 1981, Apple held its first shareholders meeting as a public company in the Flint Center, a large auditorium at nearby De Anza College, which is often used for symphony concerts. (Previous meetings were held quietly in smaller rooms, because there had only been a few shareholders: it was a small, exclusive club.) The business of the meeting had been planned (or choreographed) so that the voting could be staged in 15 minutes or less. In most cases, voting proxies are collected by mail and counted days or months before a meeting. In this case, after the IPO, many shares were in new hands.

Steve Jobs started his prepared speech, but after being interrupted by voting several times, he dropped his prepared speech and delivered a long, emotionally charged talk about betrayal, lack of respect, and related topics.

The Apple III

By the early 1980s, Apple Computer faced increasing competition from other companies. The main competitor of Apple Computer was IBM, a long-established computing firm now attempting to break into the field of desktop computing. IBM was poised to capture a large share of the computing market with the PC. The IBM PC ran DOS, an Operating System licensed from Microsoft.

While the Apple II was already established as a successful business-ready platform, Apple was not contented. The Apple III (Apple 3) was designed to take on the IBM PC in the business environment.

The Apple III was a relatively conservative design for computers of the era. However, Steve Jobs did not want the computer to have a fan; rather, he wanted the heat generated by the electronics to be dissipated through the chassis of the machine, forgoing the cooling fan.

Unfortunately, the physical design of the case was not sufficient to cool the components inside it. By removing the fan from the design, the Apple III was prone to overheating. This caused the Integrated Circuits to disconnect from the motherboard.

Customers who contacted Apple customer service were told to "drop the computer on the desk", which would cause the ICs to fall back in to place.

Thousands of Apple III computers were recalled and, although a new model was introduced in 1983 to rectify the problems, the damage was done.

Xerox PARC and the Lisa

While Apple Computers' business division was focused on the Apple III, a separate group was focused on a computer that would change the world. While the Apple III was another iteration of the text-based computer, this new machine would feature a completely different interface and introduce the words mouse, icon, and desktop into the lexicon of the computing public.

In December, 1979, Steve Jobs and a group of Apple Computer engineers toured the Xerox PARC laboratories and witnessed Xerox's research into the GUI as demonstrated on the Alto computer. It was this moment that Steve Jobs decided the future of computers was in the GUI, rather than the standard text-based interface.

In return for \$1,000,000 USD of pre-IPO stock, Xerox granted Apple Computer three days access to the PARC facilities. During this time, Apple Computer engineers studied the intricacies of the GUI or "WIMP" interface, and came away with the basis for Apple Computer's first GUI computer, the Apple LISA. (Popular folklore states that "Lisa" was Steve Jobs' first daughter; Apple maintains it means Locally Integrated Software Architecture.)

Apple Computer's engineers did not come up with the LISA interface overnight. In fact, the first iteration of the soon-ubiquitous WIMP interface was a poorly-drawn picture of a floppy disk. It was only after months of usability testing and work that Apple settled on the LISA interface of windows and icons.

The Lisa was introduced in 1983 at a cost of \$10,000 USD

The release of the Macintosh and the 1984 commercial

Apple's 1984 adThe Lisa project was removed from Jobs' control midway through development to prevent another Apple III incident and Jobs soon turned his attention to the Macintosh Project. The Macintosh was originally envisioned by Jef Raskin as a truly personal computer with everything the end-user would ever need built right in. It was a research project at the time Jobs came along in the very early development stages. Being somewhat upset about the exile from Lisa he set out to mold the Macintosh into a device that would surpass Lisa. This was a time at Apple where different projects like Lisa and Macintosh were discrete departments which were somewhat self-contained in all aspects; a serious flaw which created hostilities and unrest within the company.

The Apple Macintosh was launched in 1984 with a now famous Super Bowl advertisement based on George Orwell's novel 1984 and directed by Ridley Scott. Steve Jobs' intention with the ad was to equate Big Brother with the IBM PC and a nameless female action hero, portrayed by Anya Major, with the Apple Macintosh. The commercial ended with the following: "On January 24, Apple Computer will introduce Macintosh. And you'll see why 1984 won't be like '1984'" — the implication being that the Mac's new, "user friendly" GUI (with icons designed by graphic designer Susan Kare) would liberate computing and information from the IBM PC.

Macintosh also spawned the concept of Mac evangelism which was pioneered by Apple employee, and later Apple Fellow, Guy Kawasaki.

Despite initial marketing difficulties, such as lack of software, the monochrome-only display and the closed architecture, the Macintosh brand was eventually a success for Apple. This was due to its introduction of desktop publishing (and later computer animation) through Apple's partnership with Adobe Systems which introduced the laser printer and Adobe PageMaker. Indeed, the Macintosh would become known as the de-facto platform for many industries including cinema, music, publishing and the arts.

While it did briefly license some of its own designs, Apple did not allow other computer makers to "clone" the Mac until the 1990s, long after Microsoft dominated the marketplace with its broad licensing program. By then, it was too late for Apple to reclaim its lost market share and the Macintosh clones achieved limited success before being axed after Steve Jobs returned to Apple Computer in 1997.

Beginning of Windows

In anticipation of the Macintosh launch, Bill Gates, co-founder, chairman of Microsoft was given several Macintosh prototypes in 1983 for software development for the new computer. In 1985, Microsoft launched Microsoft Windows, its own GUI for IBM PCs using many of the elements of the Macintosh OS. This led to a long legal battle between Apple Computer and Microsoft, ending with an out of court settlement. In this settlement it was stated that Microsoft would be granted access to and allowed unlimited use of the Macintosh GUI. By that point the IBM PC system had been reverse engineered and many companies were also making IBM PC Compatibles, cheaper copies of the PC. Although the first version of Windows was technologically inferior to the Mac, a Windows-equipped PC clone could be purchased for much less.

1985: Jobs leaves Apple

After an internal power struggle between Steve Jobs and the new CEO John Sculley in 1985, Apple's board of directors sided with Sculley and Jobs was asked to resign. Jobs bought the visual effects house, Pixar. He also went on to found NeXT Inc., a computer company that built machines with futuristic designs and ran the UNIX-derived NeXTstep operating system. While not a commercial success due in part to its high price, the NeXT computer would introduce important concepts to the history of the personal computer (including serving as the initial platform for Tim Berners-Lee as he was developing the World Wide Web).

1985-1997: Sculley, Spindler, Amelio

Macintosh SE

The Apple II family of the 1980s

Apple now had two separate, incompatible platforms: the Apple II, an affordable, expandable home computer, and the Apple Macintosh, the closed platform for professionals. John Gruber, among others, has speculated that this platform incompatibility was the main reason the Macintosh did not share the initial commercial success which was experienced by the Apple II in the late 1970s.[3] However, by the mid - 1980s, the Apple II was now competing with the IBM PC and its clones, and a new energy was focused upon marketing the Macintosh.

Thus, Apple continued to sell both lines promoting them to different market segments: the Macintosh to colleges, college students, and knowledge workers, and the Apple II to home users and public schools. A few months after introducing the Mac, Apple released a compact version of the Apple II called the Apple IIc. And in 1986 Apple introduced the Apple IIGs, an Apple II positioned as something of a hybrid product with a mouse-driven, Mac-like operating environment. Apple II computers remained an important part of Apple's business until they were discontinued in the early 1990s.

The Mac family

At the same time, the Mac was becoming a product family of its own. The original model evolved into the Mac Plus in 1986 and spawned the Mac SE and the Mac II in 1987 and the Mac Classic and Mac LC in 1990. Meanwhile, Apple attempted its first portable Macs: the failed Macintosh Portable in 1989 and then the more popular PowerBook in 1991, a landmark product that established the modern form and ergonomic layout of the laptop. Popular products and increasing revenues made this a good time for Apple. MacAddict magazine has called 1989 to 1991 the "first golden age" of the Macintosh.

The early-mid 1990s

In the late 1980s, Apple's fiercest technological rivals were the Amiga and Atari ST platforms. But by the 1990s, computers based on the IBM PC had become more popular than all three; they finally had a comparable GUI thanks to Windows 3.0, and were out-competing Apple.

Apple's response to the PC threat was a profusion of new Macintosh lines including Quadra, Centris, and Performa. Unfortunately, these new lines were marketed poorly. For one, there were too many models, differentiated by very minor graduations in their tech specs. The excess of arbitrary model numbers confused many consumers and hurt Apple's reputation for simplicity. Apple's retail resellers like Sears and CompUSA often failed to sell or even competently display these Macs. Compounding matters was the fact while the machines were cheaper than a comparable PC (counting all the things built in which had to be added to the 'bare bones PC') the poor marketing gave the impression that the machines were more expensive.

In 1994, Apple surprised its loyalists by allying with its long-time competitor IBM in the AIM alliance. This was a high-profile bid to create a revolutionary new computing platform, known as PReP, which would use IBM and Motorola hardware and Apple software. PReP's (projected) outstanding performance and software would leave the PC far behind, and would upset Microsoft, which Apple had identified as its real enemy.

As the first step toward the PReP platform, Apple started the Power Macintosh line in 1994, using IBM's PowerPC processor. These processors utilized a RISC architecture, which differed substantially from the Motorola 680X0 series that were used by all previous Macs. Parts of Apple's operating system software were rewritten so that most software written for older Macs could run in emulation on the PowerPC series.

In addition to computers, Apple has also produced consumer devices. In the 1993 Apple released the Newton, an early PDA. Though it failed commercially, it defined and launched the category and was a forerunner and inspiration of devices such as Palm Pilot and Palm PC.

1997: The return of Jobs

In 1996, the struggling company beat out Microsoft and Be, Inc.'s BeOS in its bid to sell its operating system. Apple purchased Steve Jobs' company, NeXT on December 20, 1996, and its NeXTstep operating system. This would not only bring Steve Jobs back to Apple's management, but NeXT technology would become the foundation of the Mac OS X operating system.

The Microsoft Deal

At the 1997 Macworld Expo, Steve Jobs announced that Apple would be entering into partnership with Microsoft. Included in this was a five-year commitment from Microsoft to release Microsoft Office for Macintosh as well a US\$150 million investment in Apple. It was also announced that Internet Explorer would be shipped as the default browser on the Macintosh. Microsoft chairman Bill Gates appeared at the expo on-screen, further explaining Microsoft's plans for the software they were developing for Mac, and stating that he was very excited to be helping Apple return to success. After this, Steve Jobs said this to the audience at the expo:

“ If we want to move forward and see Apple healthy and prospering again, we have to let go of a few things here. We have to let go of this notion that for Apple to win, Microsoft has to lose. We have to embrace a notion that for Apple to win, Apple has to do a really good job. And if others are going to help us that's great, because we need all the help we can get, and if we screw up and we don't do a good job, it's not somebody else's fault, it's our fault. So I think that is a very important perspective. If we want Microsoft Office on the Mac, we better treat the company that puts it out with a little bit of gratitude; we like their software.

So, the era of setting this up as a competition between Apple and Microsoft is over as far as I'm concerned. This is about getting Apple healthy, this is about Apple being able to make incredibly great contributions to the industry and to get healthy and prosper again.

CEO

On July 9, 1997, Gil Amelio was ousted as CEO of Apple by the board of directors after overseeing a 12 year record low stock price and crippling financial losses. Jobs stepped in as the interim CEO to begin a critical restructuring of the company's product line. He would eventually become CEO and is serving in that position to the present day.

1998- 2001: Apple's Renaissance [The iMac, iBook, and Power Mac G4]

The original iMacAfter discontinuing Apple's licensing of its operating system to third-party computer manufacturers, one of Jobs's first moves as new acting CEO was to develop the iMac, which bought Apple time to restructure. The original iMac integrated a CRT display and CPU into a streamlined, translucent plastic body. The line became a sales smash, moving about one million units a year. It also helped re-introduce Apple to the media and public, and announced the company's new emphasis on the design and aesthetics of its products.

More recent products include the iBook, the Power Mac G4, and the AirPort product series, which helped popularize the use of Wireless LAN technology to connect computers to networks.

In 1999, Apple introduced the Power Mac G4, which utilized the Motorola-made PowerPC 7400 containing a 128-bit instruction unit known as AltiVec as its flagship processor line. Also that year, Apple unveiled the iBook, its first consumer-oriented laptop that was also the first Macintosh to support the use of Wireless LAN via the optional AirPort card that was based on the 802.11b standard.

Mac OS X

Company headquarters on Infinite Loop in CupertinoIn 2001, Apple introduced Mac OS X, an operating system based on NeXT's NeXTstep. Aimed at consumers and professionals alike, OS X married the stability, reliability and security of Unix with the ease of a completely overhauled user interface. To aid users in transitioning their applications from OS 9, the new operating system allowed the use of Mac OS 9 applications through OS X's Classic Environment. Apple's Carbon API also allowed developers to adapt their OS 9 software to use Mac OS X's features.

Apple retail stores

In May 2001, after much speculation, Apple announced the opening of a line of Apple retail stores, to be located throughout the major U.S. computer buying markets. The stores were designed for two primary purposes: to stem the tide of Apple's declining share of the computer market, as well as a response to poor marketing of Apple products at third-party retail outlets.

The iPod

In late 2001, Apple introduced its first iPod portable digital audio player.

2002 to present

In early 2002, Apple unveiled a redesigned iMac, using the G4 processor. The new design had a hemispherical base and a flat panel all-digital display supported by a swiveling neck. This model was discontinued in the summer of 2004.

In 2002, Apple also released the Xserve 1U rack mounted server. Originally featuring two G4 chips, the Xserve was unusual for Apple in two ways. It represented an earnest effort to enter the enterprise computer market and it was also relatively cheaper than similar machines released by its competitors. This was due, in no small part, to Apple's use of Fast ATA drives as opposed to the SCSI hard drives used in traditional rack-mounted servers. Apple later released the Xserve RAID, a 14 drive RAID which was, again, cheaper than competing systems.

In mid-2003, launched the Power Mac G5, based on IBM's G5 processor. Apple claims this the first 64-bit computer sold to the general public, but in fact that title actually goes to the AMD Opteron line (Opteron processors were however marketed more directly to the enterprise for use in rackmount servers and in workstations). Both 64-bit CPUs were pre-dated by the 64-bit DEC Alpha architecture, although the Alpha was aimed more at servers and workstations and not at the "general public." The Power Mac G5 was also used by Virginia Tech to build its prototype System X supercomputing cluster, which at the time garnered the prestigious recognition of the third fastest supercomputer in the world. It cost only \$5.2 million (USD) to build, far less than the previous #3 and other ranking supercomputers. Apple's Xserves were soon updated to use the G5 as well. They replaced the Power Mac G5 machines as the main building block of Virginia Tech's System X, which was ranked in November 2004 as the world's seventh fastest supercomputer.

A new iMac based on the G5 processor was unveiled August 31, 2004 and was made available in mid-September. This model dispensed with the base altogether, placing the CPU and the rest of the computing hardware behind the flat-panel screen, which is suspended from a streamlined aluminium foot. This new iMac, dubbed the iMac G5, is the world's thinnest desktop computer, measuring in at around two inches (around 5 centimeters).

Apple computers such as the PowerBook, the iBook, and the iMac are frequently featured as props in films and television series. Occasionally the heroes use Apple computers while the villains are relegated to PC compatibles. In 1996, Apple ran an advertising campaign for the PowerBook tying in with the film Mission: Impossible and in the film Independence Day a Macintosh laptop is used to infect the alien mothership and save the human race.

Through the 1990s, personal computers based on Microsoft's Windows operating system began to gain a much larger percentage of new computer users than Apple. As a result, Apple fell from controlling 20% of the total personal computer market to 5% by the end of the decade. The company was struggling financially under then-CEO Gil Amelio when on August 6, 1997 Microsoft bought a \$150 million non-voting share of the company as a result of a court settlement with Apple. Perhaps more significantly, Microsoft simultaneously announced its continued support for Mac versions of its office suite, Microsoft Office, and soon created a Macintosh Business Unit. This reversed the earlier trend within Microsoft that resulted in poor Mac versions of their software and has resulted in several award-winning releases. However, Apple's market share continued to decline, reaching 3% by 2004.[citation needed]

The Apple logo of a store on the Magnificent Mile in ChicagoInitially, the Apple Stores were only opened in the United States, but in late 2003, Apple opened its first Apple Store abroad, in Tokyo's Ginza district. Ginza was followed by a store in Osaka, Japan in August of 2004. In 2005, Apple opened stores in Nagoya, the Shibuya district of Tokyo, Fukuoka, and Sendai. Another store was opened in Sapporo in 2006. Apple's first European store opened in London in November 2004, and is currently the largest store. A store in the Bullring shopping centre in Birmingham opened in April 2005, and the Bluewater shopping centre in Kent opened in July 2005. Apple opened its first store in Canada in the middle of 2005 at the Yorkdale Shopping Centre in North York, Toronto. Later on in 2005 Apple opened the Meadowhall Store in Sheffield and the Trafford Centre Store in Manchester (UK), in January 2006 Apple also opened the Brent Cross Apple Store.

Also, in an effort to court a broader market, Apple opened several "mini" stores in October 2004 in attempt to capture markets where demand does not necessarily dictate a full scale store. The first of these stores was opened at Stanford Shopping Center in Palo Alto, California. These stores follow in the footsteps of the successful Apple products: iPod mini and Mac mini. These stores are only one half the square footage of the smallest "normal" store and thus can be placed in several smaller markets.

On April 29, 2005, Apple released Mac OS X v10.4 "Tiger" to the general public.

Apple's wildly successful PowerBook and iBook products relied on Apple's previous generation G4 architecture which were produced by Freescale Semiconductor, a spin off from Motorola. Engineers at IBM had minimal success in making their PowerPC G5 processor consume less power and run cooler but not enough to run in iBook or PowerBook formats. As of the week of October 24, 2005. Apple released the Power Mac G5 Dual that features a Dual-Core processor. This processor contains two cores in one rather than have two separate processors. Apple has also developed the Power Mac G5 Quad that uses two of the Dual-Core processors for enhanced workstation power and performance. The new Power Mac G5 Dual's cores run individually at 2.0 GHz or 2.3 GHz. The Power Mac G5 Quad's cores run individually at 2.5 GHz and all variations have a graphics processor the has 256-bit power or can be expanded to 512-bit for ultimate performance.

In a keynote address on June 6, 2005, Steve Jobs officially announced that Apple will begin producing Intel-based Macintosh computers beginning in 2006.[7] Jobs confirmed rumors that the company had secretly been producing versions of its current operating system Mac OS X for both PowerPC and Intel processors over the past 5 years, and that the transition to Intel processor systems will last until the end of 2007. Rumors of cross-platform compatibility had been spurred by the fact that Mac

OS X is based on OPENSTEP, an operating system that was available for many platforms. In fact, Apple's own Darwin, the open source underpinnings of OS X, was also available for Intel's x86 architecture.[8][9][10]

On January 10, 2006, the first Intel-based machines, the iMac and MacBook Pro, were introduced.[11][12] They were based on the Intel Core Duo platform. This introduction came with the news that Apple will complete the transition to Intel processors on all hardware by the end of 2006, a year ahead of the originally quoted schedule.

In January of 2007, Apple Computer, Inc. shortened its name to simply Apple, Inc. In his Keynote address, Jobs explained that with their current product mix consisting of the iPod and Apple TV as well as their Macintosh brand, Apple really wasn't just a computer company anymore. At the same address, Jobs revealed a product that would revolutionize an industry in which Apple had never previously competed: the Apple iPhone. The iPhone combined Apple's first widescreen iPod with the world's first mobile device boasting visual voicemail and fully functional OS X, and an internet communicator capable of running a fully functional version of Apple's web browser Safari. The iPhone was a partnership between Apple and Cingular Wireless.



HCL (Hindustan Computers Limited) is a leading global Technology and IT enterprise whose range of services spans Product Engineering and Technology Development, Application Services, BPO Services, Infrastructure Services, IT Hardware, Systems Integration, and Distribution of Technology and Telecom products in India. The HCL Enterprise comprises two companies listed in India: HCL Technologies and HCL Infosystems. HCL Technologies is the IT and BPO services arm focused on global markets, while HCL Infosystems deals in the IT, Communication, Office Automation Products & System Integration arm focused on the Indian market. Today, HCL has 45,000 employees of diverse nationalities, operating across 17 countries including 360 service centers in India. HCL has global partnerships with several leading Fortune 1000 firms, including several IT and Technology majors.

Shiv Nadar is the founder of HCL. He founded HCL in 1976 in a Delhi "Barsaati". In 1978, HCL developed the first indigenous micro-computer at the same time as Apple and 3 years before IBM's PC. In 1980, HCL introduced bit sliced, 16-bit processor based micro-computer. In 1983, HCL Indigenously developed an RDBMS, a Networking OS and a Client Server architecture, at the same time as global IT peers. In 1986, HCL became the largest IT company in India. In 1988, HCL introduced fine grained multi-processor Unix-3 years ahead of "Sun" and "HP". In 1991, HCL entered into a joint venture Hewlett Packard and HCL-Hewlett Packard Ltd. was formed. The joint developed multi-processor Unix for HP and heralded HCL's entry into contract R&D. In 1997, HCL Infosystems was formed. In the same year HCL ventured into software services. In 1999, HCL Technologies Ltd issued an IPO and became a public listed company. In 2001, HCL BPO was incorporated and HCL Infosystems became the largest hardware company. In 2002, software businesses of HCL Infosystems and HCL Technologies were merged. In 2005, HCL set up first Power PC architecture design centre outside of IBM. In the same year HCL Infosystems launched sub Rs.10,000 PC. In 2006, HCL Infosystems became the first company in India to launch the New Generation of High Performance Server Platforms Powered by Intel Dual - Core Xeon 5000 Processor. Today, HCL has a turnover of over US\$4billion.

Major Achievements of HCL

Developed the first indigenous micro-computer in 1978.

Indigenously developed an RDBMS, a Networking OS and a Client Server architecture in 1983.

In 1986, HCL becomes the largest IT company in India.

HCL introduced fine grained multi-processor Unix-3 years ahead of "Sun" and "HP".



Wipro Technologies is a global services provider delivering technology-driven business solutions. Wipro is the No.1 provider of integrated business, technology and process solutions on a global delivery platform. Azim Premji is the Chairman of Wipro Technologies. He took over the mantle of leadership of Wipro at the age of 21 in 1966. Under his leadership, the fledgling US\$ 2 million hydrogenated cooking fat company has grown to a US\$1.76 billion IT Services organization serving customers across the globe. Wipro is presently ranked among the top 100 Technology companies in the world. It has 66,000+ employees, serves 592 clients, and has 46 development centers across globe.

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Technology Infrastructure Service: Wipro's Technology Infrastructure Services (TIS) is the largest Indian IT infrastructure service provider in terms of revenue, people and customers with more than 200 customers in US, Europe, Japan and over 650 customers in India.

Business Process Outsourcing: Wipro provides business process outsourcing services in areas Finance & Accounting, Procurement, HR Services, Loyalty Services and Knowledge Services. In 2002, Wipro acquiring Spectramind and became one of the largest BPO service players.

Consulting Services: Wipro offers services in Business Consulting, Process Consulting, Quality Consulting, and Technology Consulting.

Group Companies of Wipro

Wipro Infrastructure Engineering: It has emerged as the leader in the hydraulic cylinders and truck tipping systems market in India.

Wipro Infotech: It is one of the leading manufacturers of computer hardware and a provider of systems integration services in India.

Wipro Lighting: It manufactures and markets the Wipro brand of luminaries. Wipro Lighting offers lighting solutions across various application areas such as commercial lighting for modern work spaces, manufacturing and pharmaceutical companies, designer petrol pumps and outdoor architecture.

Achievements of Wipro

First Indian IT Service Provider to be awarded Gold-Level Status in Microsoft's Windows Embedded Partner Program.

World's largest independent R&D Services Provider.

World's 1st PCMM Level 5 software company.

World's 1st IT Services Company to use Six Sigma.

The first to get the BS15000 certification for its Global Command Centre.

Among the top 3 offshore BPO service providers in the world.

Only Indian company to be ranked among the 'Top 10 Global Outsourcing Providers' in the IAOP-Fortune Global 100 listings.

First company in the world to be certified in BS 7799 (2002) security standards.



Polaris Software Lab Ltd is one of India's leading software companies. Polaris has intimate understanding of the Money business and provides solutions and services to some of the world's leading giants in the money vertical. Polaris has expertise on Investment Banking, Retail Banking, Credit Cards, Corporate Banking, Life Insurance etc. Polaris has a strong global presence with Sales and Marketing and Development centers spanning across 22 locations in over 14 countries. Headquartered in Chennai (India), Polaris has operations in Canada, United States, United Kingdom, Germany, France, Switzerland, Ireland, Singapore, Australia, Saudi Arabia, Bahrain, UAE and Japan.

Polaris Software Lab Ltd was incorporated in 1993. Polaris started providing end to end retail banking solution for Citibank India in 1994. In 1995, Polaris' quality processes were aligned to SEI CMM Level 3. First overseas development center of Polaris was commissioned for Citibank in 1997. In the same year wholly-owned subsidiaries of Polaris were formed in US and Singapore. In 1998, Polaris formed a Wholly-owned subsidiary in UK. In the same year quality processes of Polaris were aligned to SEI CMM Level 4 and ISO 9001 certified. In 1998, Polaris Retail Infotech Ltd. formed in Chennai. In 1999, Polaris went public and was listed on the major stock exchanges. In 2000, wholly owned subsidiaries of Polaris were formed in Germany, Switzerland and Australia. In 2001, Polaris became the first company in the world to be assessed and certified CMMi Level 5. In the same year it formed wholly-owned subsidiaries in Japan and Ireland. In 2004, Polaris Software Lab Ltd. was 2004 BS7799 certified. In 2005, subsidiary of Polaris was incorporated in Canada, and in 2006 Polaris Software entered Belfast. Today, Polaris has more than 750 Domain experts and over 8500 associates.

Major Achievements of Polaris Software Lab Ltd:

World's first CMMi (Capability Maturity Model Integrated) Level 5 Certified company.

CAGR of over 70%, the highest among all the IT organizations in India.
BS7799 certified
22 relationship offices across 14 countries.
More than 750 Domain Experts



TVS Group is one of India's oldest business groups. It is a giant conglomerate with presence in diverse fields like automotive component manufacturing, automotive dealerships and electronics. Today, there are over thirty companies in the TVS Group, employing more than 40,000 people worldwide and with a turnover in excess of USD 2.2 billion.

TVS Group originated as a transport company in 1911. TV Sundaram Iyengar and Sons Limited is the parent and holding company of the TVS Group. TV Sundram Iyengar and Sons Limited has the following three divisions:

TVS and Sons

TVS and Sons is the largest automobile distribution company in India. It distributes Heavy Duty Commercial Vehicles, Jeeps and Cars. TVS and Sons represents premier automotive companies like Ashok Leyland, Mahindra and Mahindra Ltd., and Honda. The company is also one of the leading logistics solution providers and has set up state-of-the-art warehouses all over the country. TVS and Sons has also diversified into distributing a range of Garage equipments.

Sundaram Motors

Sundaram Motors distributes Heavy Duty Commercial Vehicles, Cars, and auto spare parts for several leading manufacturers. The company is also the dealer for Ashok Leyland, Honda, Fiat, Ford and Mercedes Benz.

Madras Auto Service

Madras Auto Service distributes automotive spare parts for all leading manufacturers.

Other major companies of TVS Group:

TVS - Motor Company Limited

TVS Motor Company Limited is one of the largest two-wheeler manufacturers in India. It manufactures Motorcycles, Mopeds, Scooterettes and Scooters.

TVS Electronics Limited

TVS Electronics was incorporated in 1986 in collaboration with Citizen Watch Co. of Japan. The company manufactures a complete range of computer peripherals.

Axles India Limited

Axles India was promoted by Sundaram Finance, Wheels India and Eaton Corporation for the manufacture of axles for medium and heavy duty commercial vehicles in India.

Brakes India Limited

Brakes India is a joint venture between TV Sundram Iyengar and Sons Ltd. and Lucas Industries Plc., UK. The company manufactures braking equipment for automotive and non-automotive applications.

Sundaram Polymers Division

Sundaram Polymers Division manufactures Engineering Plastic compounds for various applications.

Harita Finance Limited

Harita Finance Ltd is a finance company under the TVS Group. It deals in retail finance, hire purchase, leasing and bill discounting.

Harita Finance Limited

Harita Finance Ltd is a finance company under the TVS Group. It deals in retail finance, hire purchase, leasing and bill discounting.

India Motor Parts and Accessories Limited

It is engaged in the distribution of automobile spare parts.

India Nippon Electricals Limited

It is a joint venture between Lucas Indian Service and Kokusan Denki Co Ltd., Japan. The company manufactures Electronic Ignition Systems for two wheelers and portable gensets.

IRIZAR TVS (P) Ltd:IRIZAR TVS (P) Ltd

It is a joint venture between Sundaram Industries Ltd, Ashok Leyland Ltd and IRIZAR S. Coop of Spain. The company builds bus bodies for export and domestic market.

Lakshmi Auto Components Limited

The company is a subsidiary of TVS-Suzuki. It manufactures gears, crankshafts and connecting rods for TVS-Suzuki motorbikes and mopeds.

Lucas Indian Service

Lucas Indian Service is a wholly owned subsidiary of Lucas-TVS Ltd., engaged in the sales and service of auto-electricals and fuel injection equipment.

Lucas - TVS Limited

Lucas-TVS, a joint venture between Lucas Varity group, UK and TVS Group, is a leading manufacturer of auto electrical products and diesel fuel injection equipment in India.

Sundaram Brake Linings Limited

Sundaram Brake Linings is the leading manufacturer of brake linings in India.

Sundaram-Clayton Limited

Sundaram - Clayton Ltd manufactures complete range of air brake actuation system - compressors, actuators, valves, brake chambers, spring brakes, slack adjusters, couplings, hoses, switches and vacuum boosters for light/medium and heavy commercial vehicles and trailers. Foundry Division manufactures aluminum, gravity and pressure die-castings.



Essar is one of the leading corporate houses of India. The group has diverse business interests spanning Steel, Energy, Power, Communications, Shipping & Logistics, and Construction. For the financial year ending March 2007, March 2007, Essar Group earned revenues of over US\$ 4 billion. Essar Group employs 20,000 people in 50 locations worldwide. All the investments of the group have been consolidated under Essar Global Ltd., along with its six sectoral holding companies: Essar Steel Holdings Limited, Essar Energy Holdings Limited, Essar Power Holdings Limited, Essar Communications Holdings Limited, Essar Shipping & Logistics Limited and Essar Constructions FZE.

Essar Group was founded by the Ruia family. The Ruia family originally belongs to Rajasthan. In the 19th century, the family moved to Mumbai for business and trading purposes. In 1956, Nand Kishore Ruia, the group founder, moved south to Chennai to begin independent business activities and thus the foundations of Essar Group were laid. In 1969, after the demise of Nand Kishore Ruia, his sons Shashi and Ravi Ruia took over the group and guided the group to its present destiny.

Business Interests of Essar Group**Steel**

Essar Steel Holdings Limited is a global producer of steel with presence in India, Canada, USA, Middle East and Asia. It is a fully integrated flat carbon steel manufacturer from iron ore to ready-to-market products. Its product range include Iron Ore Pellets, Hot Briquetted Sponge iron (HBI), Hot Rolled Products, Cold Rolled Products' Galvanised Products. Essar Steel is India's largest exporter of flat products.

Energy: Essar Oil Ltd. (EOL)

It is leading integrated oil and gas company spanning the entire value chain: Exploration & Production, Refinery, & Marketing. Essar was one of the first private companies to bid for exploration blocks in 1993. It was also among the first to enter the refining sector when it was opened to private participation. Its refinery at Vadinar, Gujarat has a capacity of a capacity of 10.5 MTPA.

Power

Essar Power Limited set up India's first new generation independent power plant with a 515 MW combined cycle capacity, at Hazira in the early 1990s. The capacity of this plant is being enhanced to 1500 MW. The plant has set new standards of excellence in the Indian power sector. It has the lowest manpower to megawatt ratio and one of the lowest capital costs per megawatt in India. Besides the above plant, Essar has commissioned a 32 MW coal based captive power project at Vishakapatnam; It is currently executing a captive gas based Combined Cycle Power Plant of 355 MW in two phases at Hazira, Gujarat; and setting up a 120 MW Refinery residue based Captive Co-generation Power Project at Vadinar.

Communications

In the field of communications, Essar has interests in providing telecom services, telecom retail and telecom infrastructure. Hutchison- Essar, a joint venture between Essar and Hong Kong-based Hutchison Whampoa, is India's second largest GSM service provider. The JV was recently acquired by the UK-based Vodafone Group Plc at a value of USD 18.8 billion. Essar has retained its 33% stake in the new JV with Vodafone. Essar has entered telecom retail with its brand The MobileStore. The MobileStore is a chain of retail outlets managed by Essar Telecom Retail Ltd. in association with the Virgin Group. The store chain sells mobile handsets and accessories, as well as digital lifestyle products. Essar Telecom Infrastructure Private Limited (ETIPL) is one of the largest independent telecom infrastructure service provisioning companies in India.

Shipping: Essar Shipping Ltd. (ESL)

It is one of the world's leading integrated sea logistics companies. It accounts for almost 14% of India's shipping fleet and owns India's largest VLCC (Very Large Crude Carrier), which is also India's first double hull, double bottom VLCC.

Construction

Essar is India's leading engineering, procurement and construction (EPC) contractor. Essar has special expertise in marine construction and pipelines. Essar has laid 2,500 km of pipelines and built 150 km of the prestigious Narmada canal. Essar is a well-known name in the field of infrastructure construction particularly in the areas of ports, jetties and roads.

Major Achievements of Essar Group

Set up India's first new generation independent power plant with a 515 MW combined cycle capacity at Hazira.

Built the world's largest gas-based sponge iron plant

Pioneered the laying of offshore oil and gas pipelines in India

Built India's first and longest island breakwater



Larsen & Toubro Limited (L&T) is a vertically integrated engineering and construction conglomerate with additional interests in manufacturing, services and Information Technology. L&T is one of the largest companies in India's private sector and has an international presence, with a global spread of offices. In fact it can be aptly called as an Indian multinational. Nearly 18 per cent of L&T's total revenue comes from overseas earnings.

Larsen & Toubro is one of few organizations in Indian corporate sector that is truly professionally managed. L&T was founded as a partnership firm in 1938 in Mumbai by two Danish engineers, Henning Holck-Larsen and Soren Kristian Toubro. They had arrived in India as representatives of the Danish engineering firm F L Smidth & Co in connection with the merger of cement companies that later grouped into the Associated Cement Companies. In 1944, Engineering Construction Corporation Limited (ECC) as incorporated as wholly owned subsidiary of Larsen & Toubro Limited. L&T was converted into a limited company on February 7, 1946. Starting with the import of machinery from Europe, L&T rapidly took on engineering and construction assignments of increasing sophistication. Today, L&T is a pioneer in engineering projects in terms of scale and complexity.

Engineering & Construction – Projects

L&T has an enviable track record of successful implementation of turnkey projects in major core and infrastructure sectors. L&T's core competencies in engineering include highly qualified and experienced personnel from various disciplines, state-of-the-art 2-D and 3-D CAD facilities with sophisticated plant design systems and basic engineering capabilities. L&T is the only Indian EPC company pre-qualified for executing large, process-intensive projects for oil & gas, refinery, petrochemical and fertiliser sectors.

Heavy Engineering

L&T has been among Indian corporate sector in introducing new processes, products and materials in manufacturing. It is acknowledged as one of the top five fabrication companies in the world and has globally-benchmarked workshops are located in Mumbai, Hazira, Baroda and Kanskahal.

Construction

ECC, the Engineering Construction & Contracts Division of L&T, is India's largest construction organization. It is credited with building some of India's famous landmarks such as exquisite buildings, tallest structures, largest industrial projects, longest flyovers, highest viaducts, longest pipelines etc.

Electrical & Electronics

L&T is a major international manufacturer of a wide range of electrical and electronic products and systems. In the electrical segment, L&T is India's largest manufacturer of low tension switchgear. In the electronic segment, L&T offers a wide range of meters and provides complete control and automation systems for diverse industries.

Information Technology

L&T Infotech Limited, a 100 per cent subsidiary of L&T, caters to leading international companies across the globe and offers comprehensive, end to end software solutions and services with a focus on Manufacturing, BFSI and Communications & Embedded Systems.

Machinery & Industrial Products

L&T manufactures, markets and provides service support for critical construction and mining machinery such as surface miners, hydraulic excavators, aggregate crushers, loader backhoes and vibratory compactors.

Achievements of L&T

- Built India's first indigenous hydrocracker reactor.
- Built the world's largest continuous catalyst regeneration reactor.
- Built the world's biggest fluid catalytic cracking regenerator.
- Built the world's longest product splitter.
- Built Asia's highest viaduct - Panvalnadi for the Konkan Railway.
- Built the world's longest LPG pipeline.
- Built the world's longest cross country conveyor.



Mahindra Group is one of the largest corporate groups of India. It is a US \$4.5 billion conglomerate with employee strength of over 40,000. The group has diverse business interests such as automotive, farm equipments, infrastructure, information technology, hospitality, and financial services. Mahindra Group has global presence and it is ranked amongst Forbes Top 200 list of the World's Most Reputable Companies and in the Top 10 list of Most Reputable Indian companies.

The origins of Mahindra Group can be traced back to October 2, 1945 when Mahindra brothers J.C. Mahindra & K.C. Mahindra joined hands with Ghulam Mohammad, and Mahindra & Mohammad was set up as a franchise for assembling jeeps from Willys, USA. After India's independence in 1947, Mahindra & Mohammad changed its name to Mahindra & Mahindra. Ghulam Mohammad migrated to Pakistan post-partition and became the first Finance Minister of Pakistan. Since then, Mahindra Group has gone from strength to strength and today it has evolved into a giant group.

Automotive Sector

Mahindra Group is the market leader in utility vehicles in India since inception. Mahindra also manufactures and markets utility vehicles and light commercial vehicles, including three-wheelers. Some of the famous automobile brands of Mahindra are: Scorpio and Bolero. Recently, Mahindra joined hands with French automobile major Renault to enter passenger car segment. It has launched a car called Mahindra Renault Logan.

Farm Equipment Sector

Mahindra is the largest producer of tractors in India and is among the top five tractor brands in the world. It has its own state-of-the-art plants in India, USA, China and Australia, and a capacity to produce 1,50,000 tractors a year.

Trade & Financial Services

Mahindra Intertrade Limited and its subsidiaries have specialized domain knowledge in imports and exports of commodities, domestic trading, marketing and distribution services. Mahindra Finance is one of the largest Non Banking Finance Companies in India with an asset base of about Rs. 5000 crores. Mahindra Insurance Brokers offer Life and Non-life Insurance plans to retail and corporate customers.

Mahindra Steel Service Centre

It is the first steel service centre in the organised sector in India.

Infrastructure Development

Mahindra Group has interests in real estate, special economic zones, hospitality industry, infrastructure development, project engineering consultancy and design. Mahindra Holidays & Resorts is the leader in the lifetime holiday market in India. Mahindra Gesco is fastest growing Construction Company in India. Mahindra World City is developing and promoting India's first Integrated Business City. Mahindra Acres Consulting Engineers is a multidisciplinary engineering consultancy organization.

Information Technology

Mahindra Group entered into IT sector in 1986 when it formed a joint venture with British Telecommunications plc. The company was called Mahindra-British Telecom. The Company has recently changed its name to Tech Mahindra. Tech Mahindra is a leading provider of telecommunication solution and service industry world-wide. It is India's 8th largest software exporter.

Speciality Businesses

Mahindra Group companies such as Mahindra AshTech, Mahindra Defence, Spares Business Unit and Mahindra Logistics are into Speciality Businesses. Mahindra AshTech undertakes turnkey contract execution for Ash Slurry System and Travelling Water Screens. Mahindra Defence Systems looks after the requirements of India's defence and security forces. Mahindra Logistics provide complete logistics solutions to complex transportation needs of clients across the world.

Major Achievements of Mahindra Group

Mahindra & Mahindra made the first indigenous Jeep in the country in 1949.

Fourth largest tractor company in the world.

Largest manufacturer of tractors in India.

Largest manufacturer of MUVs, offering over 20 models



Indian Oil Corporation Ltd. (IOC) is the flagship national oil company in the downstream sector. The IndianOil Group of companies owns and operates 10 of India's 19 refineries with a combined refining capacity of 1.2 million barrels per day. These include two refineries of subsidiary Chennai Petroleum Corporation Ltd. (CPCL) and one of Bongaigaon Refinery and Petrochemicals Limited (BRPL). The 10 refineries are located at Guwahati, Barauni, Koyali, Haldia, Mathura, Digboi, Panipat, Chennai, Narimanam, and Bongaigaon. Indian Oil's cross-country crude oil and product pipelines network span over 9,300 km. It operates the largest and the widest network of petrol & diesel stations in the country, numbering around 16,455.

Indian Oil Corporation Ltd. (IndianOil) was formed in 1964 through the merger of Indian Oil Company Ltd and Indian Refineries Ltd. Indian Refineries Ltd was formed in 1958, with Feroze Gandhi as Chairman and Indian Oil Company Ltd. was established on 30th June 1959 with Mr S. Nijalingappa as the first Chairman. In 1964, Indian Oil commissioned Barauni Refinery and the first petroleum product pipeline from Guwahati. In 1965, Gujarat Refinery was inaugurated. In 1967, Haldia Baraurii Pipeline (HBPL) was commissioned. In 1972, Indian Oil launched SERVVO, the first indigenous lubricant. In 1974, Indian Oil Blending Ltd. (IOBL) became the wholly owned subsidiary of Indian Oil. In 1975, Haldia Refinery was commissioned. In 1981, Digboi Refinery and Assam Oil Company's (AOC) marketing operations came under the control of Indian Oil. In 1982, Mathura Refinery and Mathura-Jalandhar Pipeline (MJPL) were commissioned. In 1994, India's First Hydrocracker Unit was commissioned at Gujarat Refinery. In 1995, 1,443 km. long Kandla-Bhatinda Pipeline (KBPL) was commissioned at Sangar. In 1998, Panipat Refinery was commissioned. In the same year, Haldia, Barauni Crude Oil Pipeline (HBCPL) was completed. In 2000, Indian Oil crossed the turnover of Rs 1 ,00,000 crore and became the first Corporate in India to do so. In the same year Indian Oil entered into Exploration & Production (E&P) with the award of two exploration blocks to Indian Oil and ONGC consortium under NELP-I. In 2003, Lanka IOC Pvt. Ltd. (LIOC) was launched in Sri Lanka. In 2005, Indian Oil's Mathura Refinery became the first refinery in India to attain the capability of producing entire quantity of Euro-III compliant diesel.

Major Achievements of Indian Oil Corporation

Currently India's largest company by sales.

Highest ranked Indian company in the prestigious Fortune 'Global 500' listing, at 135th position.

20th largest petroleum company in the world.



Ashok Leyland is the leading manufacturer of trucks, buses, special application vehicles and engines in India. The products of Ashok Leyland are at par with the best in the world. Ashok Leyland is the leaders in the Indian bus market, offering unique models such as CNG, Double Decker and Vestibule bus. More than 80% of the State Transport Undertaking (STU) buses come from Ashok Leyland. The company is a pioneer in multi axle trucks and tractor-trailers. Ashok Leyland is the largest

provider of logistic vehicles to the Indian army. It also manufactures diesel engines for Industrial, Genset and Marine applications, in collaboration with technology leaders.

The birth of Ashok Leyland can be attributed to the quest for self-reliance in the aftermath of independence. Pandit Jawaharlal Nehru persuaded Mr. Raghunandan Saran, an industrialist, to enter automotive manufacture. In 1948, Ashok Motors was set up in Madras (Chennai) for the assembly of Austin Cars. Soon, British Leyland acquired an equity stake in the company and the name of the company was changed from Ashok Motors to Ashok Leyland. In 1955, Ashok Leyland commenced of commercial vehicles. Since then Ashok Leyland has maintained its technological leadership in the India's commercial vehicle industry. Tie-ups with international technology leaders and through vigorous in-house R&D enabled Ashok Leyland to introduce latest technological breakthroughs in the Indian market. Ashok Leyland was the first to introduce full air brakes, power steering and rear engine busses in India.

In 1987, the overseas holding by Land Rover Leyland International Holdings Limited (LRLIH) was taken over by a joint venture between the Hinduja Group and IVECO. Since July 2006, the Hinduja Group is 100% holder of LRLIH.

Associate Companies of Ashok Leyland

Automotive Coaches & Components Ltd (ACCL)

ACCL was promoted by Ashok Leyland and the Tamil Nadu Industrial Development Corporation (TIDCO) in the 1980s. The company has two Divisions: ACCL Division and PL Haulwel Trailers (PLHT). ACCL is the largest Tipper Body manufacturer in the organised sector in India. Apart from the tippers, it also manufactures bus bodies, front-end structures (FES), tankers, aluminum containers, OB vans, energy vans and the like. PLHT manufactures a wide variety of after-chassis products. These include Fifth Wheel Couplers and Hoists, Semi Trailers, Container trailers, Ladle Carriers, for foundries (Steel / Aluminum), Running gears for LPG tankers, Car / Truck / Tractor Carriers, Bottom dumpers, and all types of user-specific custom-designed trailers for niche applications.

Lanka Ashok Leyland

The Company was established in 1982. It is a joint venture between Ashok Leyland and the Government of Sri Lanka. Ashok Leyland supplies chassis in both completely built-up and knocked down conditions to Lanka Ashok Leyland, which in turn assembles the chassis and builds bodies.

Ennore Foundries

Ennore Foundries was established in 1959. It is India's largest automotive jobbing foundry and caters to different segment like automobiles, tractors, industrial engines and power generators.

IRIZAR-TVS: IRIZAR-TVS

It is a joint venture between Ashok Leyland, TVS & Sons Ltd and IRIZAR, the internationally reputed bus body builder from Spain. The company was started in 2001 and it manufactures luxury coaches.

Ashok Leyland Project Services Limited

Ashok Leyland Project Services Limited (ALPS) looks after the project development activities of the Hinduja Group in India. It assists the investment entities of the Group and provides professional services to help international companies interested in projects in India.

Major Achievements of Hinduja Group

In 1993, became first Indian Auto Company to receive ISO 9002 certification.

Received ISO 9001 certification in 1994, QS 9000 in 1998, and ISO 14001 certification for all vehicle manufacturing units in 2002.

Became the first Indian auto company to receive the latest ISO/TS 16949 Corporate Certification (in July 2006).

First company to introduce full air brakes, power steering and rear engine busses in India.



BHEL or Bharat Heavy Electricals Limited is the largest engineering and manufacturing enterprise in India in the energy-related/infrastructure sector. BHEL is one of the nine large Public Sector Undertakings known as navratnas or nine jewels. BHEL offers over 180 products and provides systems and services to meet the needs of core sectors like: power, transmission, industry, transportation, oil & gas, non-conventional energy sources and telecommunication.

BHEL was founded in 1950s. Its operations are organised around three business sectors: Power, Industry - including Transmission, Transportation, Telecommunication & Renewable Energy - and Overseas Business. Today, BHEL has a wide-spread network comprising 14 manufacturing divisions, 8 service centres, 4 power sector regional centres, 18 regional offices, and a large number of project sites spread all over India and abroad. BHEL is one of the largest exporters of engineering products & services from India. BHEL has established its references in around 60 countries of the world, ranging from the United States in the West to New Zealand in the Far East. Its export range include: individual products to complete power stations, turnkey contracts for power plants, EPC contracts, HV/EHV Sub-stations, O&M services for familiar technologies, specialized after-market services like Residual Life Assessment (RLA) studies and retrofitting, refurbishing & overhauling, and supplies to manufacturers & EPC contractors.

BHEL's product range include: Steam turbines and generators of up to 500MW capacity for utility and combined-cycle applications; Steam turbines for CPP applications; Gas turbines of up to 260MW (ISO) rating; Custom-built conventional hydro turbines of Kaplan, Francis and Pelton types with matching generators, pump turbines with matching motor-generators; Spherical, butterfly and rotary valves and auxiliaries for hydro station; HSD, LDO, FO, LSHS, natural-gas/biogas based diesel power plant; Industrial turbo-sets of ratings from 1.5 to 120MW; Steam generators for utilities, ranging from 30 to 500MW capacity, using coal, lignite, oil, natural gas or a combination of these fuels; Pulverized fuel fired boilers; Stoker boilers; Atmospheric fluidized bed combustion boilers; Circulating fluidized bed combustion boilers; Waste heat recovery boiler; Boiler Auxiliaries; Heat Exchangers & Pressure Vessels; Pumps; Power Station Control Equipment; Switchgears; Bus Ducts; Transformers; Insulators; Capacitors; Energy Meters etc.

Major Achievements of BHEL

Acquired certifications for Quality Management Systems (ISO 9001), Environmental Management Systems (ISO 14001) and Occupational Health & Safety Management Systems (OHSAS 18001).

Installed equipment for over 90,000 MW of power generation.

Supplied over 2,25,000 MVA transformer capacity and other equipment operating in Transmission & Distribution network up to 400 kV (AC & DC).

Supplied over 25,000 Motors with Drive Control System to Power projects, Petrochemicals, Refineries, Steel, Aluminum, Fertilizer, Cement plants, etc.

Supplied Traction electrics and AC/DC locos to power over 12,000 km Railway network.

Supplied over one million Valves to Power Plants and other Industries.



Reliance Group is India's largest private sector enterprise with revenues in excess of US\$ 25 billion. The group has diversified business interests in areas such as petrochemicals, textiles and retail. Reliance Group's flagship company, Reliance Industries Limited (RIL), is a Fortune Global 500 company and is the largest private sector company in India.

The Reliance Group was founded by the legendary Dhirubhai H. Ambani. In 1975, the company expanded into textiles. Dhirubhai Ambani introduced equity cult in India when Reliance went public with IPO in 1977. Since the launch of its IPO RIL has expanded rapidly and integrated backwards into other industry sectors, most notably the production of petrochemicals and the refining of crude oil. Dhirubhai led the evolution as a global leader in the materials and energy value chain businesses. Today, Reliance Group's activities range from exploration and production of oil and gas, petroleum refining and marketing, petrochemicals (polyester, fibre intermediates, plastics and chemicals) to textiles and retail. Reliance enjoys global leadership in its businesses. It is the largest polyester yarn and fibre producer in the world and among the top five to ten producers in the world in major petrochemical products. Presently, Reliance Group has more than 25,000 employees on its rolls and exports products in excess of US\$ 15 billion to more than 100 countries in the world.

Reliance Anil Dhirubhai Ambani Group (Reliance ADAG) ranks among India's top three private sector business houses. The group has a market capitalization of US\$ 22 billion, net assets in excess of US\$ 7 billion, and net worth to the tune of US\$ 6 billion. Reliance Anil Dhirubhai Ambani Group has a customer base of over 50 million, the largest in India, and a shareholder base of over 8 million, among the largest in the world. R-ADAG has a business presence that is spread over 4,500 towns and 300,000 villages in India, and 5 continents across the world.

Reliance Anil Dhirubhai Ambani Group came into existence when the business empire of the Reliance Group founded by Dhirubhai Ambani was split between his two sons, Mukesh and Anil. Mukesh Ambani, the elder brother, retained Reliance Industries Limited (RIL), the flagship company of the Reliance Group. The part of the empire that was inherited by the younger brother Anil Ambani was christened as Reliance Anil Dhirubhai Ambani Group. Hence, one can say that the founder of Reliance ADAG was Dhirubhai Ambani. The interests of the Reliance Anil Dhirubhai Ambani span communications, financial services, generation, transmission and distribution of power, infrastructure and entertainment.

Companies of Reliance ADAG

Reliance Communications Limited

Reliance Communications Limited is the flagship company of the Reliance - ADA Group. The company is the culmination of Dhirubhai's dream of bringing about a digital revolution that will provide every Indian with affordable means of communication and a ready access to information. Reliance Communications Limited started operations in 1999 and has over 20 million subscribers today. It offers a complete range of integrated telecom services such as mobile and fixed line telephony, broadband, national and international long distance services, data services and a wide range of value added services.

Reliance Capital

Reliance Capital is one of India's leading private sector financial services companies. Reliance Capital deals in asset management and mutual funds, life and general insurance, private equity and proprietary investments, stock broking and other activities in financial services.

Reliance Energy Limited

Reliance Energy Limited is a fully integrated utility engaged in the generation, transmission and distribution of electricity. The company distributes more than 21 billion units of electricity to over 25 million consumers in Mumbai, Delhi, Orissa and Goa. Reliance Energy Limited currently generates 941 MW of electricity, through its power stations located in Maharashtra, Andhra Pradesh, Kerala, Karnataka and Goa. It is currently pursuing a number of gas, coal, wind and hydro-based power generation projects in Maharashtra, Uttar Pradesh, Arunachal Pradesh and Uttarakhand with total capacity of over 12,500 MW.

Reliance Media & Entertainment

Reliance Media & Entertainment has interest in Movies, Music, Sports, Gaming, Internet & mobile portals, Digital cinema, IPTV, DTH and Mobile TV. In 2005, Reliance ADA Group acquired Adlabs Films Limited, one of the largest entertainment companies in India, which has interests in film processing, production, exhibition & digital cinema. Reliance Entertainment has also forayed into the FM Radio business through BIG 92.7 FM.

Reliance Health

Reliance Health aims at providing integrated health services and plans to venture into diversified fields like Insurance Administration, Health care Delivery and Integrated Health, Health Informatics and Information Management and Consumer Health.

Petroleum Exploration and Production

Petroleum Exploration and Production is a major growth area for Reliance and Reliance intends to become a global energy major. RIL is the largest Oil & Gas acreage holder among the Private sector companies in India with 34 domestic exploration blocks covering an area of about 331,000 sq. km. It is also India's first private sector company in the Exploration and Production (E&P) sector to have discovered large gas reserves. RIL also has interests in one exploration block each in Yemen and Oman.

Petroleum Refining and Marketing

Reliance operates the third largest refinery in the world at any single location, with a capacity of 30 million tons per year of crude throughput, at Jamnagar, Gujarat. Reliance is in the process of doubling the petroleum refinery at Jamnagar, which will make it the largest petroleum refinery in the world. The products rolled out from Reliance refinery include: LPG, Propylene, Naptha, Reformate, Gasoline, TAME, Jet / Aviation Turbine Fuel / Superior Kerosene Oil, High Speed Diesel, Sulphur, and Petroleum Coke.

Polymer Reliance's

Polymer business is integrated with its cracker facility at Hazira, as well as its refinery at Jamnagar, ensuring feedstock availability at all times. The company operates world-scale plants for Polyolefins and PVC with state-of-art technologies from global licensors like Novacor, Geon and Union Carbide.

Polyester

Reliance is the largest producer of polyester fibre and yarn in the world, with a capacity of 2,000 KTA.

Polyester Intermediates

Reliance is the world's 3rd largest producer of Paraxylene (PX), 6th largest producer of Purified Terephthalic Acid (PTA) and 5th largest producer of Mono Ethylene Glycol (MEG).

Textiles

Reliance textile products are sold under the brand names of Only Vimal, Harmony, Reance, RueRel and V2 (pre-cut, pre-packed products). Reliance's Naroda Textile Complex, one of India's largest and modern textile complexes, produces about 25 million metres of fabric both for domestic and international markets.

Retail

Reliance has recently entered the retail market and is aggressively working on introducing a pan-India network of retail outlets in multiple formats.

Major Subsidiaries

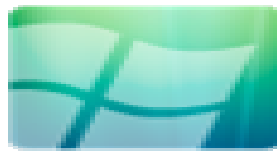
Reliance Petroleum Limited
Reliance Netherlands BV (including Trevira)
Reliance Retail Limited
Ranger Farms Private Limited
Retail Concepts and Services Private Limited
Reliance Retail Insurance Broking Limited
Reliance Dairy Foods Limited
Reliance Retail Finance Limited
RESQ Limited
Reliancedigital Retail Limited
Reliance Service Solutions Limited
Reliance Jamnagar Infrastructure Limited
Reliance Haryana SEZ Limited
Reliance Industrial Investment & Holdings Limited
Reliance Ventures Limited
Reliance Strategic Investments Limited
Reliance Exploration & Production - DMCC
Reliance Industries (Middle East) DMCC
Reliance Global Management Services (P) Limited.

Major Associates

Indian Petrochemicals Corporation Limited
Reliance Industrial Infrastructure Limited
Reliance Europe Limited

Major Achievements of Reliance

The world's largest producer of Polyester Fibre and Yarn
4th largest producer of Paraxylene (PX)
5th largest producer of Purified Terephthalic Acid (PTA)
7th largest producer of Polypropylene (PP)
Reliance's refinery at Jamnagar is the third largest refinery at a single location in the world.
Reliance pioneered the first ever Euro Convertible Bond issue by an Indian company.
Reliance is the first private sector company in India to be rated by international credit rating agencies.
First corporate in Asia to issue 50 and 100 years bond in US debt market.
First private sector company in India to record a net profit of US dollar of over 1 billion.



Early History: An Expansion of MS-DOS

The first independent version of Microsoft Windows, version 1.0, released on November 20, 1985, lacks a degree of functionality and achieved little popularity. It was originally going to be called Interface Manager, but Rowland Hanson, the head of marketing at Microsoft, convinced the company that the name Windows would be more appealing to consumers. Windows 1.0 is not a complete operating system, but rather extends MS-DOS and shares the latter's inherent flaws and problems. Moreover, the programs that shipped with this early version are considered "toy" applications with little or limited appeal to business users.

Furthermore, legal challenges by Apple limited its functionality. For example, windows can only appear "tiled" on the screen; that is, they cannot overlap or overlies one another. Also, there is no trash can (place to store files prior to deletion), since Apple believed they owned the rights to that paradigm. Microsoft later removed both of these limitations by signing a licensing agreement.

Microsoft Windows version 2 came out on December 9, 1987, and proved slightly more popular than its predecessor. Much of the popularity for Windows 2.0 came by way of its inclusion as a "run-time version" with Microsoft's new graphical applications, Excel and Word for Windows. They can be run from MS-DOS, executing Windows for the duration of their activity, and closing down Windows upon exit.

Microsoft Windows received a major boost around this time when Aldus PageMaker appeared in a Windows version, having previously run only on Macintosh. Some computer historians date this, the first appearance of a significant and non-Microsoft application for Windows, as the beginning of the success of Windows.

Versions 2.0x uses the real-mode memory model, which confines it to a maximum of 1 megabyte of memory. In such a configuration, it can run under another multitasker like DESQview, which use the 286 Protected Mode.

Later, two new versions were released: Windows/286 2.1 and Windows/386 2.1. Like previous versions of Windows, Windows/286 2.1 uses the real-mode memory model, but was the first version to support the HMA. Windows/386 2.1 has a protected mode kernel with LIM-standard EMS emulation, the predecessor to XMS which would finally change the topology of IBM PC computing. All Windows and DOS-based applications at the time were real mode, running over the protected mode kernel by using the virtual 8086 mode, which was new with the 80386 processor.

Version 2.03, and later 3.0, faced challenges from Apple over its overlapping windows and other features Apple charged mimicked the "look and feel" of its operating system and "embodie[d] and generate[d] a copy of the Macintosh" in its OS. Judge William Schwarzer dropped all but 9 of the 189 charges that Apple had sued Microsoft with on January 5, 1989.

Success with Windows 3.0

Microsoft Windows scored a significant success with Windows 3.0, released in 1990. In addition to improved capabilities given to native applications, Windows also allows a user to better multitask older MS-DOS based software compared to Windows/386, thanks to the introduction of virtual memory. It made PC compatibles serious competitors to the Apple Macintosh. This benefited from the improved graphics available on PCs by this time (by means of VGA video cards), and the Protected/Enhanced mode which allowed Windows applications to use more memory in a more painless manner than their DOS counterparts could. Windows 3.0 can run in any of Real, Standard, or 386 Enhanced modes, and is compatible with any Intel processor from the 8086/8088 up to 80286 and 80386. Windows 3.0 tries to auto detect which mode to run in, although it can be forced to run in a specific mode using the switches: /r (real), /s (standard) and /3 (386 enhanced) respectively. This was the first version to run Windows programs in protected mode, although the 386 enhanced mode kernel was an enhanced version of the protected mode kernel in Windows/386.

Due to this backward compatibility, Windows 3.0 applications also must be compiled in a 16-bit environment, without ever using the full 32-bit capabilities of the 386 CPU.

A "multimedia" version, Windows 3.0 with Multimedia Extensions 1.0, was released several months later. This was bundled with "multimedia upgrade kits", comprising a CD-ROM drive and a sound card, such as the Creative Labs Sound Blaster Pro. This version was the precursor to the multimedia features available in Windows 3.1 and later, and was part of the specification for Microsoft's specification for the Multimedia PC.

The features listed above and growing market support from application software developers made Windows 3.0 wildly successful, selling around 10 million copies in the two years before the release of version 3.1. Windows 3.0 became a major source of income for Microsoft, and led the company to revise some of its earlier plans.

A step sideways: OS/2

During the mid to late 1980s, Microsoft and IBM had co-operatively been developing OS/2 as a successor to DOS. OS/2 would take full advantage of the aforementioned Protected Mode of the Intel 80286 processor and up to 16MB of memory. OS/2 1.0, released in 1987, supported swapping and multitasking and allowed running of DOS executables.

A GUI, called the Presentation Manager (PM), was not available with OS/2 until version 1.1, released in 1988. Its API was incompatible with Windows. (Among other things, Presentation Manager placed X,Y coordinate 0,0 at the bottom left of the screen like Cartesian coordinates, while Windows put 0,0 at the top left of the screen like most other computer window systems.) Version 1.2, released in 1989, introduced a new file system, HPFS, to replace the FAT file system.

By the early 1990s, conflicts developed in the Microsoft/IBM relationship. They cooperated with each other in developing their PC operating systems, and had access to each other's code. Microsoft wanted to further develop Windows, while IBM desired for future work to be based on OS/2. In an attempt to resolve this tension, IBM and Microsoft agreed that IBM would develop OS/2 2.0, to replace OS/2 1.3 and Windows 3.0, while Microsoft would develop a new operating system, OS/2 3.0, to later succeed OS/2 2.0.

This agreement soon however fell apart, and the Microsoft/IBM relationship was terminated. IBM continued to develop OS/2, while Microsoft changed the name of its (as yet unreleased) OS/2 3.0 to Windows NT. Both retained the rights to use OS/2 and Windows technology developed up to the termination of the agreement; Windows NT, however, was to be written anew, mostly independently (see below).

After an interim 1.3 version to fix up many remaining problems with the 1.x series, IBM released OS/2 version 2.0 in 1992. This was a major improvement: it featured a new, object-oriented GUI, the Workplace Shell (WPS), that included a desktop and was considered by many to be OS/2's best feature. Microsoft would later imitate much of it in Windows 95. Version 2.0 also provided a full 32-bit API, offered smooth multitasking and could take advantage of the 4 gigabytes of address space provided by the Intel 80386. Still, much of the system still had 16-bit code internally which required, among other things, device drivers to be 16-bit code as well. This was one of the reasons for the chronic shortage of OS/2 drivers for the latest devices. Version 2.0 could also run DOS and Windows 3.0 programs, since IBM had retained the right to use the DOS and Windows code as a result of the breakup.

At the time, it was unclear who would win the so-called "Desktop wars". But in the end, OS/2 did not manage to gain enough market share, even though IBM released several improved versions subsequently (see below).

Windows 3.1 and NT

In response to the impending release of OS/2 2.0, Microsoft developed Windows 3.1, which includes several minor improvements to Windows 3.0 (such as display of TrueType scalable fonts, developed jointly with Apple), but primarily consists of bugfixes and multimedia support. It also excludes support for Real mode, and only runs on an 80286 or better processor. Later Microsoft also released Windows 3.11, a touch-up to Windows 3.1 which includes all of the patches and updates that followed the release of Windows 3.1 in 1992. Around the same time, Microsoft released Windows for Workgroups (WfW), available both as an add-on for existing Windows 3.1 installations and in a version that included the base Windows environment and the networking extensions all in one package. Windows for Workgroups includes improved network drivers and protocol stacks, and support for peer-to-peer networking. One optional download for WfW was the "Wolverine" TCP/IP protocol stack, which allowed for easy access to the Internet through corporate networks. There are two versions of Windows for Workgroups, WfW 3.1 and WfW 3.11. Unlike the previous versions, Windows for Workgroups 3.11 only runs in 386 Enhanced mode, and requires at least an 80386SX processor.

All these versions continued version 3.0's impressive sales pace. Even though the 3.1x series still lacked most of the important features of OS/2, such as long file names, a desktop, or protection of the system against misbehaving applications, Microsoft quickly took over the OS and GUI markets for the IBM PC. The Windows API became the de-facto standard for consumer software.

Meanwhile Microsoft continued to develop Windows NT. The main architect of the system was Dave Cutler, one of the chief architects of VMS at Digital Equipment Corporation (later purchased by Compaq, now part of Hewlett-Packard). Microsoft hired him in 1988 to create a portable version of OS/2, but Cutler created a completely new system instead. Cutler had been developing a follow-on to VMS at DEC called Mica, and when DEC dropped the project he brought the expertise and some engineers with him to Microsoft. DEC also believed he brought Mica's code to Microsoft and sued. Microsoft eventually paid \$150 million U.S. and agreed to support DEC's Alpha CPU chip in NT.

Windows NT 3.1 (Microsoft marketing desired to make Windows NT appear to be a continuation of Windows 3.1) arrived in Beta form to developers at the July 1992 Professional Developers Conference in San Francisco. Microsoft announced at the conference its intentions to develop a successor to both Windows NT and Windows 3.1's replacement (code-named Chicago), which would unify the two into one operating system. This successor was codenamed Cairo. In hindsight, Cairo was a much more difficult project than Microsoft had anticipated, and as a result, NT and Chicago would not be unified until Windows XP, and still, parts of Cairo have not made it into Windows as of today. Specifically, the WinFS subsystem, which was the much touted Object File System of Cairo, which had been put on hold for a while, but Microsoft further announced that they've discontinued WinFS and they'll gradually incorporate the technologies developed for WinFS in other products and technologies, notably, Microsoft SQL Server.

Driver support was lacking due to the increased programming difficulty in dealing with NT's superior hardware abstraction model. This problem plagued the NT line all the way through Windows 2000. Programmers complained that it was too hard to write drivers for NT, and hardware developers were not going to go through the trouble of developing drivers for a small segment of the market. Additionally, although allowing for good performance and fuller exploitation of system resources, it was also resource-intensive on limited hardware, and thus was only suitable for larger, more expensive machines. Windows NT would not work for private users because of its resource demands; moreover, its GUI was simply a copy of Windows 3.1's, which was inferior to the OS/2 Workplace Shell, so there was not a good reason to propose it as a replacement to Windows 3.1.

However, the same features made Windows NT perfect for the LAN server market (which in 1993 was experiencing a rapid boom, as office networking was becoming a commodity), as it enjoyed advanced network connectivity options, and the efficient NTFS file system. Windows NT version 3.51 was Microsoft's stake into this market, a large part of which would be won over from Novell in the following years.

One of Microsoft's biggest advances initially developed for Windows NT was new 32-bit API, to replace the legacy 16-bit Windows API. This API was called Win32, and from then on Microsoft referred to the older 16-bit API as Win16. Win32 API had three main implementations: one for Windows NT, one for Win32s (which was a subset of Win32 which could be used on Windows 3.1 systems), and one for Chicago. Thus Microsoft sought to ensure some degree of compatibility between the Chicago

design and Windows NT, even though the two systems had radically different internal architectures. Windows NT was the first Windows operating system based on a hybrid kernel.

Windows 95

After Windows 3.11, Microsoft began to develop a new consumer oriented version of the operating system code-named Chicago. Chicago was designed to have support for 32-bit pre-emptive multitasking like OS/2 and Windows NT, although a 16-bit kernel would remain for the sake of backward compatibility. The Win32 API first introduced with Windows NT was adopted as the standard 32-bit programming interface, with Win16 compatibility being preserved through a technique known as "thunking". A new GUI was not originally planned as part of the release, although elements of the Cairo user interface were borrowed and added as other aspects of the release (notably Plug and Play) slipped.

Microsoft did not change all of the Windows code to 32-bit; parts of it remained 16-bit (albeit not directly using real mode) for reasons of compatibility, performance and development time. This, and the fact that the numerous design flaws had to be carried over from the earlier Windows versions, eventually began to impact on the operating system's efficiency and stability.

Microsoft marketing adopted Windows 95 as the product name for Chicago when it was released on August 24, 1995. Microsoft had a double gain from its release: first it made it impossible for consumers to run Windows 95 on a cheaper, non-Microsoft DOS; secondly, although traces of DOS were never completely removed from the system, and a version of DOS would be loaded briefly as a part of the booting process, Windows 95 applications ran solely in 386 Enhanced Mode, with a flat 32-bit address space and virtual memory. These features make it possible for Win32 applications to address up to 2 gigabytes of virtual RAM (with another 2GB reserved for the operating system), and in theory prevents them from inadvertently corrupting the memory space of other Win32 applications. In this respect the functionality of Windows 95 moved closer to Windows NT, although Windows 95/98/ME does not support more than 512 megabytes of physical RAM without obscure system tweaks.

IBM continued to market OS/2, producing later versions in OS/2 3.0 and 4.0 (also called Warp). Responding to complaints about OS/2 2.0's high demands on computer hardware, version 3.0 was significantly optimized both for speed and size. Before Windows 95 was released, OS/2 Warp 3.0 was even shipped preinstalled with several large German hardware vendor chains. However, with the release of Windows 95, OS/2 began to lose marketshare.

It is probably impossible to nail down a specific reason why OS/2 failed to gain much marketshare. While OS/2 continued to run Windows 3.1 applications, it lacked support for anything but the Win32s subset of Win32 API (see above). Unlike with Windows 3.1, IBM did not have access to the source code for Windows 95 and was unwilling to commit the time and resources to emulate the moving target of the Win32 API. IBM also introduced OS/2 into the United States v. Microsoft case, blaming unfair marketing tactics on Microsoft's part, but many people would probably agree that IBM's own marketing problems and lack of support for developers contributed at least as much to the failure.

Microsoft released five different versions of Windows 95:

- Windows 95 - original release
- Windows 95 A - included Windows 95 OSR1 slipstreamed into the installation.
- Windows 95 B - (OSR2) included several major enhancements, Internet Explorer (IE) 3.0 and full FAT32 file system support.
- Windows 95 B USB - (OSR2.1) included basic USB support.
- Windows 95 C - (OSR2.5) included all the above features, plus IE 4.0. This was the last 95 version produced.

OSR2, OSR2.1, and OSR2.5 were not released to the general public, rather, they were available only to OEMs that would preload the OS onto computers. Some companies sold new hard drives with OSR2 preinstalled (officially justifying this as needed due to the hard drive's capacity). This product was sold after the name Windows 97 in some countries in Europe.

The first Microsoft Plus! add-on pack was sold for Windows 95.

Windows NT 4.0

Originally developed as a part of its effort to introduce Windows NT to the workstation market,[citation needed] Microsoft released Windows NT 4.0, which features the new Windows 95 interface on top of the Windows NT kernel (a patch was available for developers to make NT 3.51 use the new UI, but it was quite buggy; the new UI was first developed on NT[citation needed] but Windows 95 was released before NT 4.0).

Windows NT 4.0 came in four versions:

- Windows NT 4.0 Workstation
- Windows NT 4.0 Server
- Windows NT 4.0 Server, Enterprise Edition (includes support for 8-way SMP and clustering)

- Windows NT 4.0 Terminal Server

Windows 98

On June 25, 1998, Microsoft released Windows 98, which was widely regarded as a minor revision of Windows 95, but generally found to be more stable and reliable than its 1995 predecessor. It includes new hardware drivers and better support for the FAT32 file system which allows support for disk partitions larger than the 2 GB maximum accepted by Windows 95. The USB support in Windows 98 is far superior to the token, sketchy support provided by the OEM editions of Windows 95. It also controversially integrated the Internet Explorer browser into the Windows GUI and Windows Explorer file manager, prompting the opening of the United States v. Microsoft case, dealing with the question whether Microsoft was abusing its hold on the PC operating system market to unfairly compete with companies such as Netscape.

In 1999, Microsoft released Windows 98 Second Edition, an interim release whose most notable feature was the addition of Internet Connection Sharing, which was a form of network address translation, allowing several machines on a LAN (Local Area Network) to share a single Internet connection. Hardware support through device drivers was increased. Many minor problems present in the original Windows 98 were found and fixed which make it, according to many, the most stable release of Windows 9x.

Windows 2000

Microsoft released Windows 2000, known during its development cycle as "NT 5.0", in February 2000. It was successfully deployed both on the server and the workstation markets. Amongst Windows 2000's most significant new features was Active Directory, a near-complete replacement of the NT 4.0 Windows Server domain model, which built on industry-standard technologies like DNS, LDAP, and Kerberos to connect machines to one another. Terminal Services, previously only available as a separate edition of NT 4, was expanded to all server versions. A number of features from Windows 98 were incorporated as well, such as an improved Device Manager, Windows Media Player, and a revised DirectX that made it possible for the first time for many modern games to work on the NT kernel.

While Windows 2000 could upgrade a computer running Windows 98, Windows 2000 was not widely regarded as a product suitable for home users. The reasons for this were many, chief amongst them the lack of device drivers for many common consumer devices such as scanners and printers (at the time of release; situation reversed when Windows XP was released).

Windows 2000 was available in five editions:

- Windows 2000 Professional
- Windows 2000 Server
- Windows 2000 Advanced Server
- Windows 2000 Datacenter Server
- Windows 2000 Small Business Server

Windows Millennium Edition (Me)

In September 2000, Microsoft introduced Windows Me (Millennium Edition), which upgraded Windows 98 with enhanced multimedia and Internet features. It also introduced the first version of System Restore, which allowed users to revert their system state to a previous "known-good" point in the case of system failure. System Restore was a notable feature that made its way into Windows XP. The first version of Windows Movie Maker was introduced as well.

Windows Me was conceived as a quick one-year project that served as a stopgap release between Windows 98 and Windows XP. Many of the new features were available from the Windows Update site as updates for older Windows versions, (System Restore was an exception). As a result, Windows Me was not acknowledged as a unique OS (Operating System) along the lines of 95 or 98. Windows Me was widely criticised for serious stability issues, and for lacking real mode DOS support, to the point of being referred to as the "Mistake Edition". Windows Me was the last operating system to be based on the Windows 9x (monolithic) kernel and MS-DOS. It is also the last Windows operating system to lack Product Activation.

Windows XP: merging the product lines

In 2001, Microsoft introduced Windows XP (codenamed "Whistler"). The merging of the Windows NT/2000 and Windows 95/98/ME lines was achieved with Windows XP. Windows XP uses the Windows NT 5.1 kernel, marking the entrance of the Windows NT core to the consumer market, to replace the aging 16/32-bit branch. Windows XP is the longest version of Windows ever released between upgrades, from 2001 all the way to 2007 when Windows Vista was released to consumers. The Windows XP line of operating systems were surpassed by Windows Vista on January 30, 2007.

Windows XP is available in a number of versions:

- "Windows XP Home Edition", for home desktops and laptops (notebooks)
- "Windows XP Home Edition N", as above, but without a default installation of Windows Media Player, as mandated by a European Union ruling
- "Windows XP Professional", for business and power users
- "Windows XP Professional N", as above, but without a default installation of Windows Media Player, as mandated by a European Union ruling
- Windows XP Media Center Edition (MCE), released in November 2002 for desktops and notebooks with an emphasis on home entertainment
 1. Windows XP Media Center Edition 2003
 2. Windows XP Media Center Edition 2004
 3. Windows XP Media Center Edition 2005, released on October 12, 2004.
- "Windows XP Tablet PC Edition", for tablet PCs (PCs with touch screens)
 1. Windows XP Tablet PC Edition 2005
- Windows XP Embedded, for embedded systems
- "Windows XP Starter Edition", for new computer users in developing countries
- Windows XP Professional x64 Edition, released on April 25, 2005 for home and workstation systems utilizing 64-bit processors based on the x86-64 instruction set (AMD calls this AMD64, Intel calls it Intel 64)
- Windows XP 64-bit Edition, is a version for Intel's Itanium line of processors; maintains 32-bit compatibility solely through a software emulator. It is roughly analogous to Windows XP Professional in features. It was discontinued in September 2005 when the last vendor of Itanium workstations stopped shipping Itanium systems marketed as "Workstations".
 1. Windows XP 64-bit Edition 2003, based on the Windows 5.2 codebase.

Windows Server 2003

On April 24, 2003 Microsoft launched Windows Server 2003, a notable update to Windows 2000 Server encompassing many new security features, a new "Manage Your Server" wizard that simplifies configuring a machine for specific roles, and improved performance. It has the version number 5.2. A few services not essential for server environments are disabled by default for stability reasons, most noticeable are the "Windows Audio" and "Themes" services; Users have to enable them manually to get sound or the "Luna" look as per Windows XP. The hardware acceleration for display is also turned off by default, users have to turn the acceleration level up themselves if they trust the display card driver.

In December 2005, Microsoft released Windows Server 2003 R2, which is actually SP1 (Service Pack 1) plus an add-on package. Among the new features are a number of management features for branch offices, file serving, and company-wide identity integration.

Windows Server 2003 is available in five editions:

- Web Edition
- Standard Edition
- Enterprise Edition (32 and 64-bit)
- Datacenter Edition
- Small Business Server

Thin client: Windows Fundamentals for Legacy PCs

Windows Fundamentals for Legacy PCs desktopMain article: Windows Fundamentals for Legacy PCs
In July 2006, Microsoft released a thin-client version of Windows XP Service Pack 2, called Windows Fundamentals for Legacy PCs (WinFLP). It is only available to Software Assurance customers. The aim of WinFLP is to give companies a viable upgrade option for older PCs that are running Windows 95, 98, and Me that will be supported with patches and updates for the next several years. Most user applications will typically be run on a remote machine using Terminal Services or Citrix.

Windows Vista

The next client version of Windows, Windows Vista was released on November 30, 2006[1] to business customers, with consumer versions following on January 30, 2007. Windows Vista intends to have enhanced security by introducing a new restricted user mode called User Account Control, replacing the "administrator-by-default" philosophy of Windows XP. Vista also features new graphics features, the Windows Aero GUI, new applications (such as Windows Calendar, Windows DVD Maker and some new games including Chess, Mahjong, and Purple Place), a revised and more secure version of Internet Explorer, a new version of Windows Media Player, and a large number of underlying architectural changes.

Windows Vista ships in several editions:

- Starter

- Home Basic
- Home Premium
- Business
- Enterprise
- Ultimate



In 1982 Racal Electronics plc's subsidiary Racal Strategic Radio Ltd. won one of two UK cellular telephone network licences. The network, known as Racal Vodafone was 80% owned by Racal, with Millicom and the Hambros Technology Trust owning 15% and 5% respectively. Vodafone was launched on 1 January 1985. Racal Strategic Radio was renamed Racal Telecommunications Group Limited in 1985. On 29 December 1986 Racal Electronics bought out the minority shareholders of Vodafone for GB£110 million.

In September 1988 the company was again renamed Racal Telecom and on 26 October 1988 Racal Electronics floated 20% of the company. The flotation valued Racal Telecom at GB£1.7 billion. On 16 September 1991 Racal Telecom was demerged from Racal Electronics as Vodafone Group.

In July 1996 Vodafone acquired the two thirds of Talkland it did not already own for £30.6 million. On 19 November 1996, in a defensive move, Vodafone purchased Peoples Phone for £77 million, a 181 store chain whose customers were overwhelmingly using Vodafone's network. In a similar move the company acquired the 80% of Astec Communications that it did not own, a service provider with 21 stores.

In 1997 Vodafone introduced its Speechmark logo, as it is a quotation mark in a circle; the O's in the Vodafone logotype are opening and closing quotation marks, suggesting conversation.

On 29 June 1999 Vodafone completed its purchase of AirTouch Communications, Inc. and changed its name to Vodafone Airtouch plc. Trading of the new company commenced on 30 June 1999. To approve the merger, Vodafone sold its 17.2% stake in E-Plus Mobilefunk. The acquisition gave Vodafone a 35% share of Mannesmann, owner of the largest German mobile network.

On 21 September 1999 Vodafone agreed to merge its U.S. wireless assets with those of Bell Atlantic Corp to form Verizon Wireless. The merger was completed on 4 April 2000.

In November 1999 Vodafone made an unsolicited bid for Mannesmann, which was rejected. Vodafone's interest in Mannesmann had been increased by the latter's purchase of Orange, the UK mobile operator.[15] Chris Gent would later say Mannesmann's move into the UK broke a "gentleman's agreement" not to compete in each other's home territory.[16] The hostile takeover provoked strong protest in Germany and a "titanic struggle" which saw Mannesmann resist Vodafone's efforts. However on 3 February 2000 the Mannesmann board agreed to an increased offer of £112bn, then the largest corporate merger ever.[16] The EU approved the merger in April 2000. The conglomerate was subsequently broken up and all manufacturing related operations sold off.

- 28 July 2000: Reverts to its former name, Vodafone Group Plc
- 16 April 2001: First 3G voice call on Vodafone United Kingdom's 3G network.
- 2001-2002: Acquires Japan's third-largest mobile operator J-Phone, which had introduced camera phones first in Japan.
- 17 December 2001: Introduces the concept of "Partner Networks" by signing TDC Mobil of Denmark. The new concept involves the introduction of Vodafone international services to the local market, without the need of investment by Vodafone. The concept would be used to extend the Vodafone brand and services into markets where it does not have stakes in local operators. Vodafone services would be marketed under the dual-brand scheme, where the Vodafone brand is added at the end of the local brand. (i.e., TDC Mobil-Vodafone etc.)
- 2 February 2002: Finland is added into the mobile community, as Radiolinja is signed as a Partner Network. Radiolinja later changed its name to Elisa.
- 2002: Rebrands Japan's J-sky mobile internet service as Vodafone live!™
- 3 December 2002: Brand is introduced in the Estonian market with signing of a Partner Network Agreement with Radiolinja (Eesti). Radiolinja (Eesti) later changed its name to Elisa.
- 7 January 2003: Signs a group-wide Partner agreement with mobikom Austria. As a result, Austria, Croatia, and Slovenia is added to the community.
- 16 April 2003: Og Vodafone is introduced in the Icelandic market.
- 13 May 2003: Omnitel is rebranded Vodafone Italy.

- 21 July 2003: Lithuania is added to the community, with the signing of a Partner Network agreement with Bité.
- 16 February 2004: Signs a Partner Network Agreement with Luxembourg's LuxGSM.
- 20 February 2004: Signs a Partner Network Agreement with Cyta of Cyprus. Cyta agreed to rename its mobile phone operations to Cytamobile-Vodafone.
- April 2004: Purchases Singlepoint airtime provider from John Caudwell (Caudwell Group) and approx 1.5million customers onto its base for est £405million, adding sites in Stoke on Trent (England) to existing sites in Newbury (HQ), Birmingham, Warrington and Banbury
- November 2004: Introduces 3G services into Europe.
- June 2005: Increases its participation in Romania's Connex to 99%; also buys Czech mobile operator Oskar.
- 1 July 2005: Oskar of Czech Republic is rebranded as Oskar-Vodafone.
- 17 October 2005: Vodafone Portugal launches a revised logo, using new text designed by Dalton Maag, and a 3D version of the Speechmark logo, but still retaining a red background and white writing (or vice versa). Also, various operating companies start to drop the use of the SIM card pattern in the company logo. (The rebranding of Oskar-Vodafone and Connex-Vodafone also does not use the SIM card pattern.) A custom typeface by Dalton Maag (based on their font family InterFace) forms part of the new identity.
- 28 October 2005: Connex in Romania is rebranded as Connex-Vodafone.
- 31 October 2005: Reaches an agreement to sell Vodafone Sweden to Telenor for approximately € 1 billion. After the sale, Vodafone Sweden becomes a Partner Network.
- 13 December 2005: Wins an auction to buy Turkey's second-largest mobile phone company, Telsim, for \$4.5 billion.
- December 2005: Vodafone Spain becomes the second member of the group to adopt the revised logo, and it is phased in over the following six months in other countries.
- 5 January 2006: Announces the completion of the sale of Vodafone Sweden to Telenor.
- 1 February 2006: Oskar Vodafone becomes Vodafone Czech Republic, adopting the revised logo.
- 22 February 2006: Announces that it is extending its footprint to Bulgaria with the signing of Partner Network Agreement with Mobiltel, which is part of mobilkom Austria group.
- 12 March 2006: Former chief, Sir Christopher Gent, who was appointed the honorary post Chairman for Life in 2003, quits following rumours of boardroom rifts.
- 11 April 2006: Announces that it has signed an extension to its Partner Network Agreement with BITE Group, enabling its Latvian subsidiary "BITE Latvija" to become the latest member of Vodafone's global partner community.
- 20 April 2006: Vodafone Sweden changes its name to Telenor Sverige AB.
- 26 April 2006: Connex-Vodafone becomes Vodafone Romania, also adopting the new logo.
- 30 May 2006: Announces the biggest loss in British corporate history (£14.9 billion) and plans to cut 400 jobs; reports one-off costs of £23.5 billion due to the revaluation of their Mannesmann subsidiary.
- 25 August 2006: Announces the sale of 25% stake in Belgium's Proximus for Euro 2 billion. After the deal, Proximus will still be part of the community as a Partner Network.
- 5 October 2006: Vodafone announces first single brand partnership with Og Vodafone which will now operate under the name Vodafone Iceland
- 19 December 2006: Announces the sale of 25% stake in Switzerland's Swisscom for CHF4.25 billion (£1.8 billion). After the deal, Swisscom will still be part of the community as a Partner Network.
- December 2006: Completes the acquisition of Aspective, an enterprise applications systems integrator in the UK, signaling Vodafone's intent to grow a significant presence and revenues in the ICT marketplace.
- 1 January 2007: Telsim in Turkey adopts Vodafone dual branding as Telsim Vodafone.
- 1 April 2007: Telsim Vodafone Turkey drops its original brand and becomes Vodafone Turkey.
- 1 May 2007: adds Jersey and Guernsey to the community, as Airtel is signed as Partner Network in both crown dependencies
- 07 June 2007: Vodafone live! launches cheaper mobile Internet portal in the UK [17] and becomes the first mobile network to focus an entire media campaign on their newly launched mobile Internet portal in the UK, which sends shocks of excitement through the world of mobile software development.