CHAPTER - II

PROFILE OF INDUSTRIES
In this chapter a brief profile of the technology intensive industries taken up for the study has been given. Organizations that were taken up for the study belonged to technology intensive industries in two different sectors namely, manufacturing and services.

**Manufacturing Sector**

The Manufacturing sector in India contributes 22 per cent to Indian GDP (Gross Domestic Product). India's manufacturing sector grew at an average annual rate of 6 per cent per year in the fourteen years between 1990-91 and 2003-04, which was higher than the 5.8 per cent growth achieved by overall industry and the 5.7 per cent GDP growth during the same period. The sector recorded a growth of 11.3 per cent in April - June 2006. Further, Indian manufactured products are now gaining acceptance in world markets. India already exports about US$ 50 billion a year in manufactured goods and this is increasing at the rate of 20 per cent a year.

A study by the Confederation of Indian Industry (CII) and McKinsey & Co. on manufacturing sector in India estimates that Indian manufacturing export has the potential to touch US$ 300 billion by 2015, growing at an annual rate of 17 per cent as against the historic growth of 11 per cent. Of this, nearly US$ 70 billion to US$ 90 billion could be captured from just four sectors — apparel, auto components, specialty chemicals and electrical and electronic products.
The various industries in the manufacturing sector that were taken up for the study are:

**Automobile Industry**

Automotive industry has universally emerged as an important driver in the economy. Although the automotive industry in India is nearly six decades old, until 1982, only three manufacturers - M/s. Hindustan Motors, M/s. Premier Automobiles and M/s. Standard Motors tenanted the motorcar sector. Owing to low volumes, it perpetuated obsolete technologies and was out of sync with the world industry. In 1982, Maruti Udyog Ltd. (MUL) came up as a government initiative in collaboration with Suzuki of Japan to establish volume production of contemporary models. After the lifting of licensing in 1993, 17 new ventures have come up of which 16 are for manufacture of cars. This industry currently accounts for nearly 4 per cent of the GNP (Gross National Product) and 17 per cent of the indirect tax revenue.

The industry encompasses commercial vehicles, multi-utility vehicles, passenger cars, two wheelers, three wheelers, tractors and auto components. There are in place 15 manufacturers of cars and multi utility vehicles, 9 of commercial vehicles, 14 of two/three wheelers and 10 of tractors besides 5 of engines. With an investment of Rs.50,000 crores, the turnover was Rs. 59,500 crores in Automotive Sector during 1999-2000. It employs 4,50,000
people directly and 100,00,000 people indirectly and is now inhabited by
global majors in keen contention.

India manufactures about 38,00,000 2-wheelers, 5,70,000 passenger cars, 1,25,000 Multi Utility Vehicles, 1,70,000 Commercial Vehicles and 2,60,000 tractors annually. India ranks second in the production of two wheelers and fifth in commercial vehicles.

India’s automotive component industry manufactures the entire range of parts required by the domestic automobile industry and currently employ about 250,000 persons. Auto component manufacturers supply to two kinds of buyers – original equipment manufacturers (OEM) and the replacement market. The replacement market is characterized by the presence of several small-scale suppliers who score over the organized players in terms of excise duty exemptions and lower overheads. The demand from the OEM market, on the other hand, is dependent on the demand for new vehicles.

The auto sector (excluding Tractors) attained a steep cumulative annual growth of 22 per cent between 1992 and 1997. The Tractors achieved a cumulative annual growth of 16 per cent. Component production grew by 28 per cent. The component industry has maintained a low but positive growth rate mainly due to its export performance. Over the years, the component industry has maintained a 10– 12 per cent share of exports in the total production.
The automotive industry is in the midst of a major structural transformation in today's globalised scenario. "System Supply" of integrated components and sub-systems is becoming the order of the day, with individual small components being supplied to the system integrators instead of the vehicle manufacturers. In this process, most of the SSI (Small Scale Industry) units manufacturing smaller individual components are on their way to become tier 2 and tier 3 suppliers, while the larger companies including most multinational companies are being transformed into tier 1 companies, which purchase from tier 2 & 3, and sell to the auto manufacturers.

Cement Industry

The cement industry presents one of the most energy-intensive sectors within the Indian economy and is therefore of particular interest in the context of both local and global environmental discussions.

The cement industry comprises of 125 large cement plants with an installed capacity of 148.28 million tonnes and more than 300 mini cement plants with an estimated capacity of 11.10 million tonnes per annum.

The Cement Corporation of India, which is a Central Public Sector Undertaking, has 10 units. There are 10 large cement plants owned by various State Governments. The total installed capacity in the country as a whole is 159.38 million tonnes. Actual cement production in 2002-03 was 116.35 million tonnes as against a production of 106.90 million tonnes in
2001-02, registering a growth rate of 8.84 per cent. Major players in cement production are Ambuja cement, Aditya Cement, J K Cement and L & T cement.

Apart from meeting the entire domestic demand, the industry is also exporting cement and clinker. The export of cement during 2001-02 and 2003-04 was 5.14 million tonnes and 6.92 million tonnes respectively. Major exporters were Gujarat Ambuja Cements Ltd. and L&T Ltd.

The Planning Commission for the formulation of X Five Year Plan constituted a 'Working Group on Cement Industry' for the development of cement industry. The Working Group has identified following thrust areas for improving demand for cement;

i. Further push to housing development programmes;

ii. Promotion of concrete Highways and roads; and

iii. Use of ready-mix concrete in large infrastructure projects.

Further, in order to improve global competitiveness of the Indian Cement Industry, the Department of Industrial Policy & Promotion commissioned a study on the global competitiveness of the Indian Industry through an organization of international repute, viz. KPMG Consultancy Pvt. Ltd. The report submitted by the organization has made several recommendations for
making the Indian Cement Industry more competitive in the international market. The recommendations are under consideration.

Cement industry has been decontrolled from price and distribution on 1st March 1989 and de-licensed on 25th July 1991. However, the performance of the industry and prices of cement are monitored regularly. Being a key infrastructure industry, the constraints faced by the industry are reviewed in the Infrastructure Coordination Committee meetings held in the Cabinet Secretariat under the Chairmanship of Secretary (Coordination). The Committee on Infrastructure also reviews its performance.

Continuous technological upgrading and assimilation of latest technology has been going on in the cement industry. Presently 93 per cent of the total capacity in the industry is based on modern and environment-friendly dry process technology and only 7 per cent of the capacity is based on old wet and semi-dry process technology. There is tremendous scope for waste heat recovery in cement plants and thereby reduction in emission level. One project for co-generation of power utilizing waste heat in an Indian cement plant is being implemented with Japanese assistance under Green Aid Plan. The induction of advanced technology has helped the industry immensely to conserve energy and fuel and to save materials substantially. India is also producing different varieties of cement like Ordinary Portland Cement (OPC), Portland Pozzolana Cement (PPC), Portland Blast Furnace
Slag Cement (PBFS), Oil Well Cement, Rapid Hardening Portland Cement, Sulphate Resisting Portland Cement, White Cement etc. Production of these varieties of cement conforms to the BIS (Bureau of Indian Standards) Specifications. Also, some cement plants have set up dedicated jetties for promoting bulk transportation and export.

**Chemical Industry**

Chemical industry is one of the oldest industries in India. It not only plays a crucial role in meeting the daily needs of the common man, but also contributes significantly towards industrial and economic growth of the nation. The industry, including petro-chemicals, and alcohol-based chemicals, has grown at a pace outperforming the overall growth of the industry.

The Indian Chemical Industry ranks 12th by volume in the world production of chemicals. The industry’s current turnover is about US$ 30.8 billion which is 14 per cent of the total manufacturing output of the country. The export of chemicals in the year 2002 was US$ 5.875 billion, which forms almost 0.9 per cent of the world export of chemical products and about 13 per cent of the country’s total export. Substantial proportion of these exports goes to the USA, Europe and other developed nations. Its contribution to the national revenue by way of custom and excise duties is about 20 per cent. India is strong in basic chemicals that go into production
of consumer items like paints, dyes, soaps, medicines, toiletries, cosmetics, etc.

The Indian Chemicals Industry comprises both small and large-scale units. The fiscal concessions granted to small sector in mid-eighties led to establishment of large number of units in the Small Scale Industry (SSI) sector. Currently, the Indian Chemical Industry is in the midst of major restructuring and consolidation phase. With the shift in emphasis on product innovation, brand building and environmental friendliness, this industry is increasingly moving towards greater customer-orientation. Even though India enjoys an abundant supply of basic raw materials, it will have to build upon technical services and marketing capabilities to face global competition and increase its share of exports.

In terms of consumption, the chemical industry is its own largest customer and accounts for approximately 33 per cent of the consumption. In most cases, basic chemicals undergo several processing stages to be converted into downstream chemicals. These in turn are used for industrial applications, agriculture, or directly for consumer markets. Industrial and agricultural uses of chemicals include auxiliary materials such as adhesives, unprocessed plastics, dyes and fertilizers, while uses within the consumer sector include pharmaceuticals, cosmetics, household products, paints, etc.
India also produces a large number of fine and speciality chemicals, which have very specific uses and are essential for increasing industrial production. These find wide usage as food additives, pigments, polymer additives, anti-oxidants in the rubber industry, etc. Some of the important manufacturers of speciality chemicals include NOCIL, Bayer (India), ICI (India), Hico Products and Colourchem.

The Dyestuff sector is one of the important segments of the chemicals industry in India, having forward and backward linkages with a variety of sectors like textiles, leather, paper, plastics, printing ink and foodstuffs. The textile industry accounts for the largest consumption of dyestuffs at nearly 80 per cent. From being importers and distributors in the 1950’s, it has now emerged as a very strong industry and a major foreign exchange earner. India has emerged as a global supplier of dyestuff and dyes intermediates, particularly for reactive, acid, vat and direct dyes. As for a global production of dyes is concerned, India accounts for 6 per cent of the world production.

Chemical fertilizers and pesticides played an important role in the "Green Revolution" during the 1960s and 1970s. The consumption of pesticides in India is low in comparison to other countries. Indian exports of agrochemicals have shown an impressive growth over the last five years.
The key export destination markets are USA, UK, France, Netherlands, Belgium, Spain, South Africa, Bangladesh, Malaysia and Singapore.

The Government is promoting research on the use of alternative and unharmful pesticides using neem seeds. A country programme entitled "Development and Production of Neem Products as Environment Friendly Pesticides" is being undertaken by the Department of Chemicals & Petrochemicals with the financial assistance of United Nations Development Programme (UNDP)/ United Nations Industrial Development Organization (UNIDO). The project is being implemented at two locations viz., Nimpith in West Bengal and Nagpur in Maharashtra to promote production, processing and use of neem-based products, thereby aiding wasteland development, generating rural employment and providing farmers with eco-friendly/bio-degradable pesticides.

Machine Tools Industry

The global machine tools industry had a turnover of about US$ 45.3 billion in 2004, a 23 per cent growth by value over the previous year. India ranks nineteenth in production and sixteenth in consumption of machine tools in the world. The Indian machine tool industry averaged more than 35 per cent growth in 2004-05. Imports exceeded production in the year 2004 with US$ 356 million worth machine tools being imported while the production was only US$ 225 million. Machine Tools form 1 per cent of India's
engineering industry and contributes 0.3 per cent of total machinery exports.

The Indian machine tool industry currently consists of about 450 manufacturing units of which approximately 33 per cent (150 units) fall under the organized category. Further, ten major Indian companies constitute almost 70 per cent of the total production. The government-owned Hindustan Machine Tools Limited (HMT) alone accounts for nearly 32 per cent of machine tools manufactured in India. Approximately 75 per cent of the Indian machine tool producers have received the coveted ISO certification. While the large organized players cater to India's heavy and medium industries, the small-scale sector meets the demand of ancillary and other units. The machine tools industry can be broadly classified into metal-cutting and metal-forming tools, based on the type of operation. Metal cutting accounts for 87 per cent of the total output of machine tools in India. Key metal cutting tools include turning centers, machining centers and grinding centers, which account for nearly two-thirds of the total metal-cutting produce. Metal forming is dominated by presses, which account for 51 per cent share. Based on technology, machine tools can be classified into CNC (Computerized Numerically Controlled) and Conventional tools. CNC machine tools, which are highly productive and cost effective, comprise nearly 70 per cent of machine tools. Of these, CNC turning
centers, machining centers and grinding centers are the biggest segments, accounting for nearly 81 per cent of the total in 2004.

India's machine tools industry was worth US$ 225 million in 2004, which represents a growth of 95 per cent over the previous year. Of this, metal cutting machine tools accounted for US$ 194 million and metal forming machine tools were worth US$ 31 million. In terms of technology classification, CNC machine tools were worth US$ 155 million (a growth of 104 per cent over the previous year) and conventional, US$ 70 million (79 per cent growth). A large part of the increase can be attributed to a surge in orders from key manufacturing sectors such in auto ancillaries, defence and railways.

During the period 2000-2004, exports of machine tools from India rose from US $ 7.16 to US $ 10.94 – a CAGR (Compound Annual Growth Rate) of 11.2 per cent. 214 machine tools worth US $ 10.9 million were exported in 2004.

India exports machine tools to 51 countries, including to prominent ones such as Germany, the United Kingdom, Australia, Japan and the United States.

Bulk of the imports comprises metal-cutting machine tools. Machining centres, turning centres, grinding centres and presses comprised nearly half of the total machine tool imports into the country in 2004. The increasing
imports imply that India's domestic production has not kept pace with the growth in demand for machine tools, indicating a potential for investment in domestic capacity.

While the machine tools industry in India has nearly 150 organised players, 70 per cent of output comes from the top ten manufacturers. Increasing competition among the top players, and the entry of MNCs (Multinational National Corporations) like ABB and Siemens into the sector, has led to an overall improvement in capabilities and performance, with companies focusing on technology, design and product development. Most machine tool manufactures are adapting new manufacturing techniques like TPM (Total Productive Maintenance), TQM (Total Quality Management), and Six Sigma to deliver world class manufacturing solutions.

**Steel Industry**

Indians were familiar with iron and steel during the Vedic age more than 4,000 years ago. It is evident from the Iron Pillar at the outskirts of Delhi. But the seeds of modern steel industry were sown by Sir Jamshedji Tata in 1907 when Tata Iron & Steel Company Ltd. (TISCO) was set up. The first steel ingots were rolled in TISCO in 1911. This was followed by the establishment of the Mysore Iron and Steel Works in 1936, later renamed as Visvesvaraya Iron & Steel Works. Three years later in 1939, production of steel started in another private steel company, the Indian Iron & Steel
Company, now a subsidiary of the Steel Authority of India Limited (SAIL). Thus, at the time of independence, India possessed a small but viable steel industry with an annual capacity of 1.3 million tonnes. In 1951, finished steel production in India was 1.1 million tonnes.

In the era of planned economy, iron and steel, a core and basic sector, received the full attention of the Government. It became a key sector for public investment for the first Five Year Plan itself. The year 1953 saw the first agreement being signed with the Germans to establish a 1 million tonne plant at Rourkela in Orissa. Two more agreements for setting up steel plants, at Bhilai with the erstwhile USSR’s assistance and another at Durgapur with the help of U.K. were signed in 1956. Successive capacity augmentations at Bhilai, Durgapur and Rourkela saw their capacity increase to 2.5, 1.6 and 1.8 million tonnes per annum respectively by the end of the 60s.

A new plant at Bokaro with a capacity of 2.5 million tonnes per annum went into production in 1973-74. The year 1978 witnessed a major restructuring of these steel-making public sector units giving birth to the public sector giant, SAIL, having a "Navaratna" status today, with an aggregate capacity of over 10 million tonnes. The first shore-based public sector integrated steel plant, viz. The Rashtriya Ispat Nigam Limited of 3 million tonnes per annum capacity went into production in August, 1992.
The process of the economic reforms ushered in substantial liberalisation of the policies and institutions governing trade, industry and finance. With this the complexion of Indian iron and steel industry has undergone a sea change.

Iron and steel industry became one of the foremost sectors to be opened under the New Economic Policy. Substantial private investments flowed in with the consequent changes heralding a new beginning for the interplay of free market enterprise in this vital sector.

In the post-liberalisation era, the structure of the steel industry is significantly and vastly different from the pre-liberalization era with the advent of major steel producers in the private sector, which have come up with the world-class technologies and capacities.

There has been a clear focus on the state-of-the art technology. Presently, India can boast of new technologies like Corex, Thin Slab Casting and Compact Strip Mill Technology, DC Electric Arc Furnaces, Twin Shells AC EAFs etc. in the steel industry. Steel producers in the public and private sector have taken upon themselves with determination and commitment to overcome the new and arduous challenges to come up to the Government’s expectations as also the people of our country.

Although India started steel production as early as in 1911, steel exports began only in 1964. Exports in the first five years were mainly due to
demand downturn in the domestic iron and steel market. Once domestic demand revived, exports declined. India once again started exporting steel only in 1975, touching a figure of 1 million tonne of pig iron and 1.4 million tonnes of steel export in 1976-77. Thereafter, exports again fell rapidly to meet the challenges arising from increased domestic demand.

There has been a substantial growth in export of steel during the post-liberation period, even overtaking sectors like electronic goods and man-made fabrics. There has also been a qualitative change in the export of steel items. Earlier, export consisted mainly of plates, bars and rods and structurals, whereas, now semis, hot-rolled coils, cold-rolled coils and galvanized sheets are also being exported.

The Government has been making all-out efforts to help the domestic steel industry to overcome the problems faced by them. To boost the demand and consumption of steel, an Institution for Steel Development & Growth (INSDAG) was set up involving leading steel producers in the country. The Development Commissioner for Iron & Steel had launched a National Campaign for increasing the demand for steel in non-traditional sectors, particularly in the construction, rural and agro-based industrial sectors. Other areas include reduction in power and railway tariffs, reduction in input costs, strengthening of antidumping mechanism, setting up a steel
exporter’s forum and an empowered committee for research and development.

**Tea Industry**

India has long held the title of being the largest tea producer and consumer in the world. Though traditionally exports have been the engine for growth (and profits), the collapse of India’s biggest customer (USSR) exposed India’s competitive weaknesses vis-à-vis producers in Sri Lanka and Kenya, whose tea gardens are much newer. Interestingly, despite the loss of major export markets, Indian companies have been somewhat insulated thanks to faster growing domestic consumption.

Many in the industry believed that by 2005, there will be a shortage of tea for the domestic market. At the same time, production of tea cannot be increased sharply since the constraint is land, which is scarce. Also, Indian companies have not invested adequately in replanting. However, recent moves to liberalize imports from the SAARC region have belied the hope of producers that prices will rise sharply. Further, when India lifts quantitative restrictions, the market will be further hit by cheaper tea products from Vietnam, Indonesia, and China. This has led Indian producers to invest in plantations outside India.

World tea production in the last decade has grown at an annual rate of 1.81 per cent per annum and consumption has kept pace at a slightly higher
growth rate of 2.05 per cent per annum. After India, the second largest
producer is China but they mainly produce green tea, while India produces
mainly black tea. World tea exports have grown by almost 2 per cent over
the last decade. Sri Lanka is the largest exporter followed by Kenya, China
and India. World imports grew yearly at 1.2 per cent over the last decade.
The largest importers are the CIS, UK and Pakistan followed by the United
States, Egypt and Japan.

India produces some of the world's finest teas, as also the largest variety.
Among the famous speciality flavours are Darjeeling tea and Assam Tea
from the north and Nilgiri tea from the south. Tea is normally classified
based on the processing, leaf size and grade. Fermentation is the major
process and creates two major classifications, black and green tea. Black tea
is further classified into CTC (cut, tear and curl) and Orthodox tea.
Consumers in different parts of the country have varied tastes.

Of the total Indian tea market, branded packaged teas account for 33-35 per
cent by volume. Hindustan Lever (HLL) leads with around 43-45 per cent
market share of the packaged tea market, while Tata Tea is the No. 2 with
around 17-18 per cent market share. Apart from these two players and
Duncans, the market is extremely fragmented with many smaller /regional
players.
Given the competition in the domestic market and threat from outside, Indian tea producers have realized the importance of latest technology in producing the finest quality tea. For this, more and more tea producers have invested in machines using latest technology for tea processing.

**Service Sector**

Service sector accounts for more than half of India's Gross Domestic Product (GDP). The rise in service sector's share in GDP marks a structural change. Reason for high growth rate in service sector in India is liberalization in regulatory framework that gives rise to innovation and high export earnings. The growth rate of India's service exports in 2002 was 8 per cent with regards to 5 per cent worldwide. India is ranked 21st among exporters of services.

The various industries in the service sector that were taken up for the study are:

**Banking Industry**

Liberalization and de-regulation process initiated by the Indian Government in early nineties has completely changed the face of the Indian banking industry. The entry of new private sector banks with the state-of-the-art technology and lean structures has forced the old private sector and public-sector banks to respond to the new challenges with aggressive restructuring measures. The past five years have seen the public sector banks rapidly
introducing new products and services, computerizing and networking key branches, rationalizing manpower and launch a number of initiatives to improve operating efficiencies.

Organized banking was active in India since the establishment of the General Bank of India in 1786. After independence, the Reserve Bank of India (RBI) was established as the central bank and in 1955, the Imperial Bank of India, the biggest bank at the time, was taken over by the government to form state-owned State Bank of India (SBI). RBI had undertaken an exercise to merge weak banks to strong banks and the total number of banks thus reduced from 566 in 1951 to 85 in 1969.

With the objective of reaching out to masses and meeting the credit needs of all sections of people, the government nationalized 14 large banks in 1969 followed by another 6 banks in 1980. This period saw enormous growth in the number of branches and the banks' branch network became wide enough to reach the weakest sections of the society in a vast country like India. SBI's network of 9033 domestic branches and 48 overseas offices is considered to be one of the largest for any bank in the world.

The economic reforms unleashed by the government in early nineties included banking sector too, to a significant extent. Entry of new private sector banks was permitted under specific guidelines issued by RBI. A number of liberalization and de-regulation measures aimed at
consolidation, efficiency, productivity, asset quality, capital adequacy and profitability have been introduced by the RBI to bring Indian banks in line with International best practices. With a view to giving the state-owned banks operational flexibility and functional autonomy, partial privatization has been authorized as a first step, enabling them to dilute the stake of the government to 51 per cent. The government further proposed, in the Union Budget for the financial year 2000-01, to reduce its holding in nationalized banks to a minimum of 33 per cent on a case-by-case basis.

There are a total of about 300 scheduled commercial banks in India. The older private sector banks are mostly regional players and enjoy a small share. The public sector banks including the State Bank group (SBI and its subsidiaries) dominate the industry with 77 per cent share of the deposits and 70 per cent share of net profit. Excluding SBI group, public sector banks still command a very high share of close to 50 per cent share of the total industry in terms of deposits.

Though the new private sector banks and foreign banks have a lower share in customer deposits, they command a higher share of the net profit. Due to restrictions on branch expansion, foreign banks traditionally focused their operations on the top 25 cities of the country. However, they differentiated their operations by focusing on premier customers and set superior standards in productivity, customer service and operating efficiencies by
using state-of-the-art technology. Global best practices were introduced and practiced. More importantly, they built durable competencies by attracting the best manpower, building proprietary technologies and processes and by building strong brand image. The new private sector banks modelled their strategies after the foreign banks. They built much larger branch networks than foreign banks, though small by comparison to public sector banks and pose, by far, the greatest challenge to the dominance of public sector banks.

The public sector banks (the State Bank group and the nationalized banks) had to face a tough challenge when the new private sector banks made their entry in early nineties. The new banks had the benefit of starting on a clean slate and had started with state-of-the-art technology, which in turn helped them save on manpower costs and provide better services. On the other hand, the older banks had not kept up-to-date with technology and were facing competition of this kind for the first time. Many of the public sector banks launched an array of products and services, especially on the retail front, to match the competition. Some of the new products include debit cards, credit cards, international cards, special deposits, sweep-in accounts, demat accounts and any-where-banking. Some of the new services include round-the-clock phone banking, Automated Teller Machines (ATMs), inter-city, inter-branch banking, net banking and bill payment services.
Many public sector banks have even launched their own asset management companies to offer mutual fund services to their customers.

Banks in India have invested aggressively in computerization and networking of branches. The oldest and the biggest bank, SBI, had computerized 3701 branches by March 2003, constituting nearly 41 per cent of its total branches. Many of these branches were also networked so that their customers could be offered ‘any-time, any-where’ banking services. The other public sector banks too embarked on a similar computerization drive.

All banks have made heavy investments in the installation of large networks of ATMs. ATMs proved a tremendous success by reducing the load on branches significantly as, apart from carrying out routine transactions such as cash withdrawal etc, customers can avail such services as transfer of funds and payment of utility bills by visiting any of the ATMs located conveniently.

Consultancy Industry

Management consultancy includes services contracted for and provided to organizations by specially trained and qualified persons, who assist in an objective and independent manner, the client organization to identify management problems, analyze such problems, recommend solutions to these problems, and help, when requested, in the implementation of
solutions. Engineering consultancy is defined as application of physical laws and principles of Engineering (The application of scientific principles to practical ends as the design, construction, and operation of efficient and economical structures, equipment and systems) to a broad range of activities in the areas of construction, manufacturing, mining, transportation and environment.

Since the origin of consultancy, the firms have been characterized by diverse functional areas such as engineering, accounting, law, or banking. Consulting organizations are generally classified as Management consultancy organizations, Engineering consultancy organizations and Others which include Legal consultancy organizations, Socio Economic consultancy organizations and Financial consultancy organizations.

The demand for consulting services tends to increase with the economic development of the country. The requirement for consultancy services stems from a diverse range of clients, largely governed by the large corporate sector and the Government in various forms, viz, country, institutions, bilateral / multilateral agencies. After Independence, the Indian Government had focused on investment in core industrial sector and infrastructure. The investment in these sectors attracted various construction and engineering companies to explore the business opportunities and contribute their expertise in these sectors. Domain experts
were required who could provide their core skill and competence in designing and building the core industry, dams, roads, buildings etc.

Over the years, as the Indian industry started maturing, the Indian consulting industry also started expanding, not only in terms of size, but also in terms of the service offerings. Over the period, specialist consulting advice was being sought by clients in India and this opened the opportunity for a number of specialist organizations to draw on their specialist knowledge base and resources to meet the demand for specialist consulting services. The development of consultancy capabilities and business is directly proportional to growth in economic and industrial development. Due to the nature of the industry, getting accurate estimates of its size is difficult. It is estimated that the consultancy business in India engages about 100,000 persons in about 5000 consulting firms. According to estimates, the current size of the consultancy industry in India is about Rs. 10,000 crores including exports and is expected to grow at a CAGR of approximate 25 per cent in the next few years.

The nature of consultancy services varies in its content and extent. The Reserve Bank of India classified management and engineering services under other Business Services as per WTO classification which is indicated in their publication ‘India’s invisibles’. Given the recent spurt in contributions from the services sector, efforts are underway to provide
accurate estimates of the services industry size, however such efforts may not offer the expected results, since the consulting industry by nature is very diverse and encompasses a wide array of services and sectors. Many of the services and sectors overlap and it is not possible for accurate estimation.

An analysis of the consultancy contracts secured by Indian project overseas has been carried out by Exim Bank of India. As per the analysis, the geographical dispersion of contracts secured during 1995 – 96 to 2000 – 01 indicates that consultancy contracts were secured largely in West Asia which accounted for 39 per cent number wise and 46 per cent value wise followed by South East Asia and Pacific & South Asia. South East Asia constituted 22 per cent both by number and by value whereas South Asia was 18 per cent number wise and 16 per cent value wise. According to the 2002 data of the Federation of Indian Export Organizations (FIEO), India’s share in global trade in services was about 1.3 per cent. India’s share of consultancy exports is about 0.5 per cent of global trade in services.

International firms are larger in size and operate across countries which give them market access to these countries and also the opportunity to tap the market for consulting business. However Indian consulting organisations are growing with great pace to compete with international organisations.
Local presence in the countries benefits multinational organisations in liaising with clients in these countries with sustained business development resulting better prospecting record with large expenditure on business development when compared to Indian firms who largely depend on proactive business development in these countries at low business development cost.

Some of the key initiatives of the government in promoting exports of consultancy services are through Market Development Assistance (MDA), Market Access Initiative (MAI) scheme, proactive EXIM (Export-Import) Policy and EXIM Bank schemes. Government also provides exemption on service tax for export of consultancy services. However due to lack of clarity in the provisions in the present notification, consultancy export may be affected.

**Information Technology**

Information Technology is the fastest growing segment of Indian industry both in terms of production and exports. In recent times, 'software development and IT enabled services' have emerged as a niche opportunity for India in the global context. The Government is taking all necessary steps to make India, a Global Information Technology Superpower and a front-runner in the age of Information Revolution. The Government has announced promotion of Information Technology as one of the five top
priorities of the country and constituted a National Task Force on Information Technology and Software Development.

The year 2004 marked a turning point in the history of global trade in services, with growing acceptance of IT based global delivery model. With ever increasing availability of international bandwidth and powerful workflow management software, it is now possible to disaggregate any business process, execute the sub-processes in multiple centres around the world, and reassemble it, in near-real time, at another location. This is driving fundamental changes in the global IT services landscape, vendors and customers are redefining the levels of value creation in the industry. In the wake of changing global service landscape, Indian Information Technology (IT) and IT enabled services (ITES-BPO) continue to chart remarkable growth.

The Indian software and services export is estimated at Rs. 78,230 crore (US$ 17.2 billion) in 2004-05, as compared to Rs. 58,240 crore (US $ 12.8 billion) in 2003-04, an increase of 34 per cent both in rupee terms and dollar terms.

Indian ITES-BPO sector industry continues to grow from strength to strength, witnessing high levels of activity – both onshore as well as offshore. Last year witnessed vendors moving up the value-chain to offer higher-end research and analytics services to their clients. Attrition levels
also remained high, between 25-40 per cent, as demand for trained talent outpaced supply.

As export revenues from ITES-BPO grew from US $ 2.5 billion in year 2002-03 to US $ 3.6 billion in years 2003-04, a year-on-year growth of 44 per cent was achieved. In year 2003-04, ITES-BPO exports accounted for over 27 per cent of the total export revenue earned by the Indian IT-ITES industry.

The Indian IT success story has also highlighted India 's attractiveness as an investment destination – also beyond the IT sector. Another key impact of the global sourcing model popularised by the growth of IT-ITES has been the reversal of the brain drain – as people of Indian origin (who went to pursue careers abroad), as well as young expatriates, are now attracted to work in India.

Indian IT-ITES growth has had a significant multiplier effect on the Indian economy. Apart from the direct impact on national income and employment, the sector has also contributed to the growth of several ancillary industries, a rise in direct-tax collection and an increase in consumer spend due to the significantly higher disposable incomes.

The rapid growth of ITES-BPO and the IT industry as a whole has made a deep impact on the socio-economic dynamics of the country. The sector has risen to become biggest employment generator with the number of jobs
added almost doubling each year, has spawned a number of ancillary businesses such as transportation, real estate and catering, and has contributed to a rising class of young consumers with high disposable incomes.

The industry's contribution to the national economic output has nearly tripled—from 1.2 per cent in the year 1997-98 to 3.5 per cent in 2003-04. With this growth, the sector is estimated to have accounted for 4.1 per cent of the national GDP in the year 2004-05.

The total number of IT and ITES-BPO professionals employed in India has grown from 284,000 in 1999-2000 to over 1 million in 2004-05, growing by over 160,000 in the last year alone.

**Health Care Industry**

The state of health of citizens of a nation is important in two ways— it reflects the quality of life of its people and impacts economic development.

The world has made remarkable improvements in life expectancy. Significant strides have been made in the control of several diseases. However, developing countries still face enormous problems in the health sector. For example, the child mortality rates in developing countries are about ten times higher than those in the developed countries. Developing countries are fighting the war against ill health simultaneously on two fronts - infectious life threatening diseases and looming lifestyle diseases.
India, as a developing country, has the dual problem of addressing life-threatening diseases for a vast population, while simultaneously tackling the growing numbers afflicted with lifestyle diseases.

India does not have a strong health infrastructure and has several infirmities in its health system. The overall level of funding allocated for health care on a national basis is comparatively high (5.7 per cent of GDP). Government’s funding for health care (1.7 per cent of GDP) is low compared to other emerging nations. Funding for health care is largely individual, rather than collective. There are very few effective financing mechanisms. This is responsible for the fact that adequate health care is unaffordable for the vast majority of India’s population.

The existing system of health care in India is fraught with many inequities. Current funding is being used sub-optimally and is not directed to maximising health gain. Significant disparities exist between urban and rural areas, between different states and between poorer and wealthier segments of the population. The current structure of the health care delivery system, especially public health care, does not provide enough incentives for improvement in efficiency. There are stark deficiencies in health care quality and regulation is weak.

This state of affairs portends a major handicap for India in the information era where quality of human capital of a nation determines economic growth.
and development. An improvement in health systems and infrastructure is vital to assure India's future.

India's population is expected to be around 1.24 billion by the year 2015. To meet its obligation for a healthier society, large investments in the health sector are required. The total expenditure on health in 2015 is estimated at Rs 1,81,120 crores, at current prices. Of this, Rs 1,17,423 crores (65 per cent) should be in the public sector and Rs 63,697 crores (35 per cent) in the private sector. This pattern of spending between public and private will be a reversal of the current situation where government spending is about 22 per cent of the total health expenditure. The government will have to spend about five times its current spending on health, but focusing on primary and preventive health.

In terms of GNP, the health expenditure works out to 3.06 per cent of GNP for the year 2015 and 9.72 per cent of GNP for the year 2000. Public expenditure will be 6.3 per cent of GNP at current levels and 1.99 per cent on 2015 year levels.

As for human resources, the existing level of the number of doctors is 3.6 lakhs. There is need for substantially increasing the number of paramedical professionals for meeting the increased health care needs.

The challenge of the future is daunting. Rapidly escalating healthcare demand fuelled by a dual burden of disease and population growth and the
rising expectations of a wealthier and better-informed society will place an untenable strain on the nation’s healthcare system.

**Logistics Industry**

Traditionally, Logistics was considered a subset of the broader term transportation connoting movement of goods from one place to another. However, in the present scenario, customer needs and requirements are changing day after day and so mere transportation does not hold any significance. Activities like warehousing and inventory management, which were not given much attention in the past, are now focus areas for companies. Nowadays, companies have started outsourcing not only their basic transportation requirements but complete management of their supply chains. This is because companies are increasingly focusing on their core competencies in order to control costs and ensure efficient utilization of resources.

The logistics industry in India is estimated to be around Rs.600bn (approximately $12bn). It is largely fragmented and unorganized. The share of the organized sector is only 20-30 per cent. Transport Corporation of India Ltd. is the leader in the supply chain solutions industry with a market share of 1.5 per cent.

Till a few years ago, the term Logistics simply meant movement of goods from one place to another. However, since the early nineties, there has been
a sea change in the role of logistics solutions providers. Recognizing the need and the requirement of businesses today, logistics companies are now seeking to provide complete supply chain solutions to their customers. Therefore, in addition to the basic transportation, they are providing value-added services such as warehousing, inventory management, freight forwarding and express services.

Logistics and Supply Chain management is a Rs. 600bn (approx) industry that contributes about 13 per cent to the country's GDP. This industry is likely to grow at a CAGR of 7 per cent during the next five years. The sector has grown by leaps and bounds in the last few years. This is attributed to the interplay of various factors which include the boom in the aviation sector, the robust state of the Indian economy, impetus given to strengthening infrastructure and surge in demand for express services. The growth has also been fuelled by the change in the mindset of companies who are now focusing on their core competencies and outsourcing not only logistics requirements but the entire supply chain management.

In the present scenario, Indian logistics companies are continuously innovating and adopting newer strategies to meet the changing needs of consumers. Though 50 per cent of the companies have outsourced activities like transportation, warehousing and customs clearing/forwarding, outsourcing the rest of the supply chain activities is uncommon.
E-Logistics is an emerging trend in the country. IT has become an integral part of the supply chain management industry so much so that more and more companies are integrating IT systems with traditional logistics services. In this age of global competition, GPS (Global Positioning System) Technology is becoming an indispensable part of the Express delivery service Industry. It is used to accurately pinpoint the location of a vehicle. Companies like XPS have developed web-based applications using the latest technology for their Air and Courier divisions to provide real time consignment tracking to the customers.

With the government actively focusing on developing and upgrading infrastructure, transportation by road, which comprises 65 per cent of all transportation in India, will get major impetus. With the modernization of airports on the anvil, the air cargo industry is all set to reach new heights. Supply Chain Management (SCM) is increasingly emerging as the next big thing.

The supply chain solutions industry has been growing steadily in the last few years. The boom in the retail sector, the opening of the aviation sector, the liberalization of policies are some of the factors that have pushed growth. With more and more companies outsourcing their logistics requirements and India becoming a manufacturing hub, the sector is bound to witness even further growth. Especially sectors such as pharmaceuticals,
automobile, telecom, who thrive on effective and efficient management of their supply chains.

India spends 13 per cent of its GDP on logistics compared to an average of 10 per cent in other developing countries. Worldwide, better supply chain management has reduced logistics costs by nearly 1 per cent in 10 years. The Indian industry is looking at this improvement in the supply chain and logistics activities as a means to gain the competitive edge by adopting logistics and SCM concepts and practices.

This has created a need for a range of Logistics and SCM solutions ranging from logistics, supply chain, transportation and material handling to storage, warehousing, IT, Inventory management, etc., that benefit the productivity and efficiency of the entire value chain in the multiple dimensions of customer service, costs, profits and speed.

**Power Industry**

Accelerating economic growth and achieving higher standards of living depend upon the availability of adequate and reliable power at an affordable price. Unlike other commodities, electricity cannot be stored for future use. In other words, its generation and consumption have to be simultaneous and instantaneous. The unique features of power as a commodity or service make the dynamics of its supply and demand difficult to manage. Installing power generation, transmission and distribution capacity is a complex, time
consuming and expensive process. Power is among the most capital-intensive infrastructure sectors.

Power has been placed in the list of concurrent subjects under the Indian Constitution with the Centre and the States both having jurisdiction. After independence, the State Electricity Boards (SEBs)/State Electricity Departments were the sole utilities (except a few licensees in private sector) responsible for generation, transmission and distribution of electricity. To supplement the efforts of States in bridging the yawning gap between demand and supply of power, it was decided, in mid seventies, to set up generating stations and associated high/extra high voltage transmission lines in the Central Sector. Today, States control about 60 per cent of the country's generation capacity, 70 per cent of the transmission network, and almost 100 per cent of the distribution system.

On account of inadequate generation capacity, the country is plagued by power shortages. The total energy shortage, during 2000-2001, was 39,816 million units, amounting to 7.8 per cent and the peak shortage was 10,157 MW translating to 13 per cent of peak demand. Based on the demand projections made in the 16th Electric Power Survey, over 1,00,000 MW additional generation capacity needs to be added by 2012 to bridge the gap between demand and supply of power.
The large coal reserves in the country provide a ready and economical resource and ensure energy security. Hence, coal has been identified as the mainstay fuel for power generation till 2012. Emphasis has been laid on setting up large pit head stations to avoid high costs associated with transportation of high ash bearing Indian coal and overstraining the already stretched rail network.

Hydroelectricity is clean energy and its generation is not linked to issues concerning fuel supply, especially the price volatility of imported fuels. It enhances our energy security and is ideal for meeting peak demand. Less than one fourth of the vast hydel potential of 1,50,000 MW has been tapped so far. Compared to the high utilization of hydro potential in countries like Norway (58 per cent), Canada (41 per cent) and Brazil (31 per cent), the utilization of only 17 per cent of its hydel potential by India is extremely low. In fact, the share of hydro generation in India has gradually declined during the past 25 years. Consequently, thermal generation, which should generally be used for base load operation, is also being used to meet peaking requirements.

As against the desirable hydro share of 40 per cent, the current share is only about 25 per cent in India.

The Ministry has developed appropriate strategies to fully exploit the country's hydro potential and accords high priority for its development.
Some major strategies in this regard include basin wise development in order of priority through ranking being done by the CEA (Central Electricity Authority), higher budgetary allocation, better tariff dispensation, and a three-stage clearance process to reduce time and cost overruns.