Chapter - III

Project Management in the Indian Context
3.1 Project management practices in ancient India

Indian civilization is one of the oldest civilizations in the world. In its evolution, Indians have been constructing some of the most breathtaking monuments and created spaces and townships that have been the envy of many countries in the world. The most famous have been the Harappa and Mohenjo-Daro townships that have been created on the banks of Indus and cities like the present Delhi (erstwhile Hastinapura). Countless Lakes, check dams and aqueducts have been created across centuries by rulers to help farmers prosper in agriculture. India has been the adobe for magnificent structures from time immemorial. Almost all rulers across the length and breadth of the country built magnificent temples. Some of these structures such as the Khajuraho Temple, Meenakshi Temple in Madurai, Sun Temple in Konark, etc. were built centuries ago with very high precision, yet with limited technological aids. Given the understanding of the time when most of these structures developed, it is most certain that many of the following challenges must have impeded the execution:

- Location – most of these locations either on hill tips, middle of forests, etc.
- Sizes – Spreading over large areas of land with some being as large as cities themselves.
- Symmetry and precision – All structures are in some way aligned to the Sun, and the magnitude of the effort of alignment increased with the size of the structure.
- High level of detail – Most of the structure in India are also centres of art and culture, hence the large number of statues, wall paintings and art work. Indian art generally seems to focus on symmetry and detailing and the same is reflected in the constructions as well.
• Material Availability – Since most of the structures were developed in the outskirts of the cities, transport of raw materials and coordination of the supply chain must have been a challenge.

• Manpower availability – As most tasks were manpower intensive due to lack of mechanization, sourcing large manpower numbers was a challenge.

This meant, coordination with large number of teams, each responsible for a specific time based activity; planning and designing, with limited tools and resources; large scale manpower mobilization; attention to detail and high quality of output, with manual resource intensive monitoring; managing safety and hazards on sites, etc. Furthermore, as materials were scarce, travelling and logistics was time consuming; and excavation tools were limited or inadequate. All these factors meant that the planners / designers or stake holders had to effectively consider all these aspects in their planning and later prune the supply chain to achieve efficiency, accuracy and timeliness.

Information in text is not available with respect to project management during these times. However, with a detailed analysis of the socio-economic structure and the motivation towards construction of these massive structures, certain plausible answers could be arrived at. Most of these large structures would be results of instructions from the aristocracy. Skilled craftsmen must have been appointed to design and erect the structures within a given timeframe. Often funds were unlimited as it came from the central vaults and manpower would have been made available on request. Construction manpower and labourers would have been slaves, prisoners, immigrants or farmers who worked on such projects out of fear or respect or for better living conditions as the case may have been. Skilled artisans must have been appointed by the aristocracy to decorate and beautify the structures with paintings and sculptures.
Quality of these structures was critical as the focus was on design, architecture and magnificence. Lack of quality was reprimanded. Specialists in various fields were aggregated from across the empire to work on such tasks.

3.2 Project management practices in medieval India

The medieval era in India witnessed numerous changes in the architectural forms though with limited change in project management practices. India was constantly invaded by other stronger rulers and their construction styles and practices, slowly seeped in to find strongholds in the Indian history. All structures - from the magnificent Temples and planned cities in the south, built by the Vijayanagara Empire to the enormous sandstone fort structures built by the Mughals - have meticulous planning and project management ingrained in each stone block. With time, as the magnanimity of these structures grew, the need for effective project management would have also increased. With steady improvements in mechanization, skill and technology, reduced time to accomplish tasks as well as the overall completion time, the complexity of the structures increased. With increased speed of activities, the need for coordination at a much higher speed must have been a challenge that the project managers at that time had to deal with.

Though the size of the structures and the complexity increased, the project management practices or approach to project management would not have been very different from ancient India. These structures were also fascinations of the aristocracy and were micro managed by the soldiers. The other substantial difference between the ancient era and the medieval era, was that the large structures were no more places of worship, but fortresses to protect the civilians in the province from enemies. Hence these structures had to be strong enough to be withstanding the enemy attack; usually
on top of hills or small mountains, to provide for tactical advantage; time was of essence as the structures were meant for protection and not just show. This made the construction of these structures very difficult and the role of the Project Managers challenging.

In the medieval period since most of these structures had a military and security aspect involved, the design focus shifted to strength and usability in the forts and to architectural wonders restricted to the shrines and temples. These structures were again largely built by the slaves and the peasants (in their off seasons) and supervised by the military personnel on the field. The military had complete control over the activities, and delays or errors at work were often reprimanded. The slaves and the peasants working on these structures were provided food shelter and clothing in order to survive. The military hierarchy was utilized to achieve efficiency, control and precision.

3.3 Project management practices in pre-independence India / British India

The British era in India, brought in numerous changes in terms of infrastructure development and overall economic growth backed by large scale projects. The British introduced India to large scale ship building, Railways and Airways. These projects required very high levels of precision and control – both time and money, due to their large scale.

Technological developments in British India started out in the mid-18th century with introduction of railways, telegraph lines, roadways, railway tracks and trains, journeys of steam ships, equipped with sophisticated implements. British administration had brought in a technological revolution in India. Development in Transport was mainly witnessed in roads and railways, considering military
requirements between 1780 and 1840, the British began to repair, improve the roads of India. The development of roadways helped strengthen British rule in India. Furthermore, India’s inland coalfields could not be exploited until the introduction of railways. Coal was one of the primary incentives for railway construction in India. However, due to high demand for cotton from Deccan and North India, the expansion of railway routes became a need. Railways were deemed as an effective means of fighting famine, hence facilitating the desired growth of the market economy.

The project management practices, even during British India were not very different from the medieval and ancient Indian practices and philosophies. The projects continued to be driven top down, with limited escalations or concern for the on-field workers. The military or the armed forces continued to be the controllers of activities on the field. The primary difference brought in by the British in their projects in India was the reliance on specialists, engineers and designers for carrying out the tasks at hand. The other difference to the earlier emphasis was laid on materials used, design of structures and tools employed to perform certain tasks. Furthermore, the mechanization during the course of the project was higher than that used earlier; this reduced the time to launch the project drastically.

3.4 Project management practices in post-independence India

The project management practices have witnessed a stark change in project sponsors, managers and on field workers are observed. The project sponsors in post-independence times were either government bodies or private investors. The modus operandi for project development was either through contracts or direct labour deployment or a mix of both. The essential difference in the approach was on efficiency and economics. The projects had to be completed on time and within
budgets, as the transparency in the system increased. The project sponsors were accountable to their investors and to the general public in case of government projects.

Thus, till early 20th century, all engineering projects were generally managed by creative architects, scholars/ engineers, and master builders themselves. It was only in the mid-20th century that global organization in UK, USA, etc. started to systematically apply and adopt project management tools and techniques to engineering projects. Hence, Project Management as a discipline was developed from several fields of application including civil construction, engineering, and heavy defence activity. The forefathers of project management were Henry Gantt and Henri Fayol, who have both made invaluable contributions to the discipline. Henry Gantt is called the father of planning and control techniques and is famous for his use of the Gantt chart as a project management tool. Henri Fayol is credited for creation of the five management functions that form the foundation of the body of knowledge associated with project and program management. Their work has been the forerunner to modern project management tools including work breakdown structure (WBS) and resource allocation. Mid-20th century marked the beginning of the modern project management era where core engineering fields come together to work as one. This percolated to the India in the late 60’s and early 70’s during the numerous infrastructure projects as a part of the 5 year plans.

3.5 Growth of Indian economy through five year plans

Growth of Indian economy through five year plans serves as an example of successful project management in India is various sectors over the last six decades. The eleven Five year plans implemented over the period 1951 – 2012, narrate a rich
successful story of a nation that moved from a colonial background to a modern nation that has created a name for itself in the world.

The first five year plan addressed, mainly, the agrarian sector, including investments in dams and irrigation. The agricultural sector was hit hardest by the partition of India and needed urgent attention.

The second five-year plan focused on industry, especially heavy industry. Unlike the First plan, which focused mainly on agriculture, domestic production of industrial products was encouraged in the Second plan, particularly in the development of the public sector. Hydroelectric power projects and five steel mills at Bhilai, Durgapur and Rourkela were established. Coal production was increased. More railway lines were added in the north east.

The third plan stressed on agriculture and improvement in the production of wheat, but the brief Sino-Indian War of 1962 exposed weaknesses in the economy and shifted the focus towards the [Defence industry]. In 1965–1966, India fought a War with Pakistan; there was a severe drought in 1965. The war led to inflation and the priority was shifted to price stabilization. The construction of dams continued. Many cement and fertilizer plants were also built. Punjab began producing an abundance of wheat.

During the fourth five year plan, government nationalized 14 major Indian banks and the Green Revolution in India advanced agriculture. In addition, the situation in East Pakistan (now Bangladesh) was becoming dire as the Indo-Pakistani War of 1971 and Bangladesh Liberation War took Funds earmarked for the industrial development had to be diverted for the war effort. India also performed the Smiling Buddha underground nuclear test in 1974.
The Fifth five year plan saw stress being laid on employment, poverty alleviation, and justice. The plan also focused on self-reliance in agricultural production and defence. Electricity Supply Act was enacted in 1975, which enabled the Central Government to enter into power generation and transmission. The Indian national highway system was introduced and many roads were widened to accommodate the increasing traffic. Tourism also expanded.

The sixth plan also marked the beginning of economic liberalization. Price controls were eliminated and ration shops were closed. This led to an increase in food prices and an increase in the cost of living. As an outcome of the sixth five year plan, there had been steady growth in agriculture, control on rate of Inflation, and favourable balance of payments which had provided a strong base for the seventh five Year plan to build on the need for further economic growth.

The Seventh Plan laid stress on improving the productivity level of industries by upgrading of technology. The main objectives of the 7th five year plans were to establish growth in areas of increasing economic productivity, production of food grains, and generating employment.

Modernization of industries was a major highlight of the Eighth Plan. Under this plan, the gradual opening of the Indian economy was undertaken to correct the burgeoning deficit and foreign debt. Meanwhile India became a member of the World Trade Organization on 1 January 1995.

Ninth Five Year Plan India runs through the period from 1997 to 2002 with the main aim of attaining objectives like speedy industrialization, human development, full-scale employment, poverty reduction, and self-reliance on domestic resources.
The Tenth five year plan aimed to achieve 8% GDP growth per year and had sub goals like reduction of poverty ratio by 5 percentage points by 2007, Providing gainful and high-quality employment at least to the addition to the labour force, Reduction in gender gaps in literacy and wage rates by at least 50% by 2007. Towards this the 20 point program was introduced.

The eleventh plan 2007 - 2012 aims to address the core areas like improvement in per capita Income & Poverty reduction, improve overall Education level, improve health as measured by parameters like Infant mortality, total fertility rate, clean drinking water, reduce malnutrition and anaemia in women and girl child, Ensure that all children enjoy a safe childhood, without any compulsion to work, Improve Infrastructure like Electricity, Road connections, Telecommunications, rural housing. Improve environment by increasing forest and tree cover, Attain WHO standards of air quality in all major cities Treat all urban waste water, to clean river waters and Increase energy efficiency.

This stupendous success journey has been made possible through a series of projects in areas as diverse as Infrastructure (roads, railways, Ports and townships), Agriculture (Dams, Canals, Bridges), Power (Generating stations, Transmission and distribution network), Manufacturing (Heavy, medium and small scale industries), Education (schools, colleges and research institutions), Hi Technology (Defence, Space, atomic Energy, Telecom, IT and BT) that have been successfully implemented across the country. This path has no doubt been a journey of learning for the practitioners of project management as the various attributes of the project like size, technological advancement, Human capital (skill sets required), funding models, control procedures and global impact changed with time.
3.6 Project Management practices in Karnataka

Karnataka has a rich history of projects that have been implemented over centuries. To name a few: Construction of celebrated temples and monuments at Belur/ Halebid, Somanathapura, Sravanabelogola, Hampi, Pattadakal, Ihole and Badami, Gol Gumbaz; Construction of major Dams like KRS, Thungabhadra, Hemavathi, Alamatti and Irrigation canals like Visveswaraya canal, Virija canal etc; Power stations at Shimsha (First in India), Jog falls (Highest falls in the world); and construction of Rail and Roads connecting all important cities. Further, development of ports, harbours (Mangalore, Karwar, Malpe etc); establishing educational institutes of repute (IISc, IIMB, RRI, NITK, Mysore, Bangalore, and Karnataka Universities); Public sectors and central research institutions (HAL, BEML, BEL, BHEL, ITI, HMT, ISRO, CPRI, CFTRI, CLR1, CSIR, LRDE, ADE etc.) deserve attention. Karnataka has also been recognized as the knowledge capital of the country with important cities like Bangalore, Mangalore and Mysore contributing to the growth of IT sector. Many Global companies in diverse sectors like Aviation, Health, Telecom, Engineering, Finance, Banking, Insurance and Retail have set up development centres at Bangalore, Mysore, Mangalore and Hubli in Karnataka. Today Karnataka has been recognized as a performing state, role model and most sought out investment destination of global investors and one of the top contributors to the GDP of the country. The success story of growth in Karnataka has been made possible by the sustained efforts of practitioners in project planning and implementation at all the sectors of the economy.
3.7 Project Management in New age (2000 and beyond)

The Indian Economy in the early parts of independence grew mainly due to contributions from various sectors like Irrigation and Power to support Agriculture, Infrastructure like Roads, Rail, Sea Ports, Airports and communication to support Manufacturing. Opening up of the economy, investments from foreign countries and technology interventions in IT and Telecom fuelled the growth of the economy and created large scale opportunities in almost all sectors including major increases in service sector. These changes brought in specialized trained manpower including reverse brain drain that created a wealth of talent that laid to the foundation of best world class practices being followed by almost all sectors in India.

In such an environment Project management practice in India has grown in leaps and bounds with both theoreticians and practitioners contributing to all sectors that impact the Indian economy including the new age sectors like IT, Telecom and Infrastructure apart from traditional practitioners like Government and Public enterprises. Projects have now become technologically complex, multifaceted and challenging. This has led to development of a plethora of best practices adopted by each industry. The best practices and learning’s have been thought provoking and better advanced methods of project management have been developed and adopted to take care of the challenges that occurred during the life of the project at various instances around the world. Advancements in IT and telecommunications have ensured that better tools for tracking managing events and action points are available. In this scenario, research study to understand project management practices and process practiced by various business organizations in Bangalore was considered appropriate.
3.8 Business Environment in the country

At this Juncture, it is felt appropriate to include a short discussion on the business environment prevalent in the country and the contribution of some of the major sectors to the economic growth of the Country. This provides macroeconomic view of the sector in which Project Management is being practiced in the sector. Businesses and governments around the world have seen the need for experienced project professionals to manage their increasing load of projects. Project management has grown at almost exponential rates. 1990s and 2000s witnessed major changes in the Indian economy due to economic liberalization in India. This revitalization took place in the whip of balance-of-payment emergency. The government of India allowed private infusions in Indian market which facilitated monetary infusion from FDI and FII. As per the estimate by Ministry of Statistics and Programme Implementation, GDP of India in the year 1990 stood at 5,542,706 in comparison with 842,210 in 1975. Information technology, telecommunications, electronics and hardware, pharmaceuticals, biotechnology, consumer durables, retail, infrastructure, airlines, hospitality, power, etc are sectors which contributed to the success of India GDP history post 1990s.

The GDP is widely accepted norm to estimate the wellbeing of a nation's economy. The GDP of a nation is defined as the market price of overall goods and services generated within a country in an allotted time frame. Year 2000 saw a significant rise with GDP touching the benchmark of 20,791,898. In the year 2007 gross domestic product was projected at about 8% that of the United States. National Democratic Front led by Bharatiya Janata Party vigorously indulged in economic development during the period 1998-2004. Telecom sector in that period was the major beneficiary of the major economic triumph, as Indian government passed
universal telecom license in the telecom industry, which sanctioned CDMA license holders to offer GSM services and vice versa. NDA government also proposed the Golden Quadrilateral road network linking main metros of Delhi, Kolkata, Mumbai and Chennai. Education was made an essential right when the constitution of India was revised and huge amount of money was infused into the Sarva Shiksha Abhiyan scheme. The funds required for this scheme has been mopped up by imposing an education cess on tax payers.

In the coming years, the escalating economic growth is assumed to efficiently tackle the short comings and blockages of the infrastructure. This fast changing, ostensibly disorganized and disturbed situations appear to be more optimistic than the earlier times. The statistics speak itself for the development which took place in India revealing gross domestic product in the year 2005 as 34,195,278 in comparison with 20,791,898 in the year 2000.

According to World Bank report, India Gross Domestic Product accounts to 1217 billion dollars or 1.96% of the world economy. India being a diverse economy incorporates customary village farming, handicrafts and wide range of contemporary industry and services. Services are considered as a chief factor behind the economic elevation accounting for more than half of India's productivity. Since 1997, Indian economy has registered an average growth rate of more than 7%, minimizing poverty rate by around 10%. GDP means the total value of all the services and goods that are produced within the territory of the nation within the specified time period. The country has the GDP of around US$ 1.09 trillion in 2007 and this makes the Indian economy the twelfth biggest in the whole world.

India's GDP grew at a notable 9.2 per cent in the year 2006-2007. Service sector accounts for more than half of the GDP and is a landmark in the economic
history of India and helps the nation to come closer to the basics of an industrial
economy. India is positioned as one of the major economies worldwide in terms of the
purchasing power parity (PPP) of the gross domestic product (GDP) by chief financial
units of the world such as the International Monetary Fund, the CIA and the World
Bank.

In terms of agricultural output India is the second largest. Industries related to
the agriculture have also played an important role in the upgradation of the nation's
economy by opening up employment avenues in the forestry, fishing and logging
sectors. For the elevation in the production volume in Indian agriculture various five
year plans should be given due credit. Improvements in irrigation methods as well as
usage of modern technologies have also added value to the agriculture processes.
Growth of GDP in the last decade is shown in the table 3.1 below.

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<td>10.4</td>
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3.9 Agriculture and allied sectors like forestry

Agriculture and allied sectors like forestry, logging and fishing accounted for 18.6% of the GDP in 2005, employed 60% of the total workforce and despite a steady decline of its share in the GDP, is still the largest economic sector and plays a significant role in the overall socio-economic development of India. Yields per unit area of all crops have grown since 1950, due to the special emphasis placed on agriculture in the five-year plans and steady improvements in irrigation, technology, application of modern agricultural practices and provision of agricultural credit and subsidies since the green revolution. Agriculture Growth Rate in India GDP had been growing earlier but in the last few years it is constantly declining. Still, the Growth Rate of Agriculture in India GDP in the share of the country's GDP remains the biggest economic sector in the country. The growth rate of India GDP is 9.4% in 2006-2007. The agricultural sector has always been an important contributor to the India GDP. This is due to the fact that the country is mainly based on the agriculture sector and employs around 60% of the total workforce in India. The agricultural sector contributed around 18.6% to India GDP in 2005.

Agriculture Growth Rate in India GDP in spite of its decline in the share of the country's GDP plays a very important role in the all-round economic and social development of the country. The Growth Rate of the Agriculture Sector in India GDP grew after independence for the government of India placed special emphasis on the sector in its five-year plans. Further the Green revolution took place in India and this gave a major boost to the agricultural sector for irrigation facilities, provision of agriculture subsidies and credits, and improved technology. This in turn helped to increase the Agriculture Growth Rate in India GDP.
Agriculture Growth Rate in India GDP has slowed down for the production in this sector has reduced over the years. The agricultural sector has had low production due to a number of factors such as illiteracy, insufficient finance, and inadequate marketing of agricultural products. Further the reasons for the decline in Agriculture Growth Rate in India GDP are that in the sector the average size of the farms is very small which in turn has resulted in low productivity. Also the Growth Rate of the Agricultural Sector in India GDP has declined due to the fact that the sector has not adopted modern technology and agricultural practices. Agriculture Growth Rate in India GDP has also decreased due to the fact that the sector has insufficient irrigation facilities. As a result of this the farmers are dependent on rainfall, which is however very unpredictable. Table 3.2 provides details of the contribution made by the Agriculture sector to Indian GDP over the last decade.
### Table 3.2 Agriculture and Other Allied Activities Contribution to India GDP over the last decade

<table>
<thead>
<tr>
<th>Year</th>
<th>1st Quarter INR crores</th>
<th>2nd Quarter INR crores</th>
<th>3rd Quarter INR crores</th>
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#### 3.10 Industrial output

Manufacturing sector in addition to mining, Quarrying, electricity and gas together account for 27.6% of the GDP and employ 17% of the total workforce. Economic reforms introduced after 1991 brought foreign competition, led to privatisation of certain public sector industries, opened up sectors hitherto reserved for the public sector and led to an expansion in the production of fast-moving consumer goods. Table 3.3 below provides information on the contribution made by
Industrial sector to India GDP. In recent years, Indian cities have continued to liberalize, but excessive and burdensome business regulations remain a challenge in some cities.

Post-liberalisation, the Indian private sector, which was usually run by oligopolies of old family firms and required political connections to prosper was faced with foreign competition, including the threat of cheaper Chinese imports. It has since handled the change by squeezing costs, revamping management, focusing on designing new products and relying on low labour costs and technology. The Indian market offers endless possibilities for investors.

Table 3.3: Contribution of Industry Sector to India GDP

<table>
<thead>
<tr>
<th>Year</th>
<th>1st Quarter in INR crores</th>
<th>2nd Quarter in INR crores</th>
<th>3rd Quarter in INR crores</th>
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3.11: Services

Service industry employ English-speaking workers on the supply side and on the demand side, has increased demand from foreign consumers interested in India's service exports or those looking to outsource their operations. India's IT industry, despite contributing significantly to its balance of payments, accounts for only about 1% of the total GDP or 1/50th of the total services.

During the Internet bubble that led up to 2000, heavy investments in undersea fiber optic cables connected Asia to the rest of the world. The fall that followed the economic boom resulted in the auction of cheap fiber optic cables at one-tenth of their original price. This development resulted in widely available low-cost communications infrastructure. All of these investments and events, not to mention a swell of available talent, resulted in India becoming almost overnight the center for outsourcing of Business process. Within this sector and events, the ITES-BPO sector has become a big employment generator especially amongst young college graduates. The number of professionals employed by IT and ITES sectors is estimated at around 1.3 million as on March 2006. Also, Indian IT-ITES is estimated to have helped create an additional 3 million job opportunities through indirect and induced employment.

3.12 Software Industry in India

With the huge success of the software companies in India, the Indian software industry in turn has become successful in making a mark in the global arena. This industry has been instrumental in driving the economy of the nation on to a rapid growth curve. As per the study of NASSCOM the IT/ITES industry recorded a growth of 4-7 per cent in the year 2010. The export of software has also gone up, which has
been instrumental in the huge success of the Indian software companies as well as the industry. In fact, software export from India accounts for more than 65% of the total software revenue. The domestic software market largely depends upon sale of software packages and products, which constitute major part of revenues. Products account for almost 40% of the domestic market. On the other hand, more than 80% of revenue from software exports comes from software services like custom software development and consultancy services etc.

**Reasons behind Success of Indian software companies**

There are a number of reasons why the software companies in India have been so successful. Besides the Indian software companies, a number of multinational giants have also plunged into the India IT market. India is the hub of low cost skilled software professionals, which are available in abundance. It helps the software companies to develop cost-effective business solutions for their clients. As a result, Indian software companies can place their products and services in the global market in the most competitive rate. This is the reason why India has been a favourite destination for outsourcing as well. Many multinational IT giants also have their offshore development centres in India.

**Interesting Facts about the Software Industry in India**

India won recognition for its software writing skills in the late 1990s. Low cost salaries which are almost equal to one fifth of the salaries paid to US and European IT counterparts have helped outsourcing companies like Infosys, Tata Consultancy Services and Wipro. The software industry in India was hit hard by the controversial fraud at Satyam Computers.

There are many software companies in India which have been doing well. However, some of the top Indian software companies can be listed below in Table 3.5 below.
Table 3.4 Top 10 Indian software companies and their performance during 2010.

<table>
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<tr>
<th>Rank</th>
<th>Company Name</th>
<th>Turn Over</th>
<th>PAT</th>
<th>Assets</th>
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<td>9068.04</td>
<td>25037.81</td>
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<td>5297.7</td>
<td>27837</td>
</tr>
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<td>27</td>
<td>Infosys Ltd.</td>
<td>28712</td>
<td>6823</td>
<td>25976</td>
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<tr>
<td>48</td>
<td>HCL Technologies Ltd.</td>
<td>16030.08</td>
<td>1646.51</td>
<td>9843.99</td>
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<td>-147.3</td>
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<td>142</td>
<td>Mphasis Ltd.</td>
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<td>922.75</td>
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<td>199</td>
<td>Patni Computer Systems Ltd.</td>
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<td>430.15</td>
<td>2968.28</td>
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<tr>
<td>213</td>
<td>Oracle Financial Services</td>
<td>3163.76</td>
<td>1111</td>
<td>5405.74</td>
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<tr>
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<td>3i Infotech Ltd.</td>
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<td>252.51</td>
<td>3826.41</td>
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</table>
3.13 Telecommunications

The Communications Industry Analysis of India suggests that the industry has registered phenomenal growth since the 1990s. The Government of India came out of its old monopoly-market concept to open-market policy regime. This resulted in economic renaissance in India and different Indian industries grew to record heights in record time. The success of India telecommunication industry is also noteworthy and its contribution towards the overall health of Indian economy is substantially high.

Commenting on the Indian Communications Industry, Analysts are of the opinion that although, this industry has matured tremendously over the last fifteen years but huge scope of growth still waits to be explored. Urban India is more or less well connected with basic telephone services but the semi-rural area needs more attention.

The most important and unexplored area is the rural- India and huge scope of growth is lying still untapped. The Government of India is now more focused on faster development of rural-telephony in rural parts of India. The latest telecommunication policy offers host of fiscal incentives and tax rebates to attract investors, both domestic and foreign investors.

Telecom Regulatory Authority of India or the TRAI regulates the telecommunication industry of India. It has earned good reputation for transparency and competence. Three types of operators function in this industry. With 110.01 million connections, the Indian telecommunication industry is the fifth largest and fastest growing telecommunication industry in the world. The subscriber base of the Indian telecommunication industry has grown by 40% in the year 2005 and is projected to touch 250 million by the end of the financial year 2007. In the last 3 years, two out of every three new telephone connections were wireless and today it
accounts for about 55% of the total telephone subscription in India, as compared to only 40% in 2003. The wireless subscriber growth in India is expected to add 2.5 million new subscribers in every month of the financial year 2007-2008. The wireless subscriber base in India, rose from 33.69 million subscription in 2004 to 62.57 million subscription in the financial year 2004 -2005. The wireless technologies those are currently operating in the Indian telecommunication industry are Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA). The Indian telecommunication industry now has 9 GSM and 5 CDMA service providers serving in 19 circles and 4 metro cities and connecting more than 2000 towns across the length and breadth of India.

*The main service providers in the Indian telecommunication service are as follows:*

- State owned companies like - VSNL, BSNL and MTNL.
- Private Indian companies like - Reliance Communication and Tata Teleservices.
- FDI invested companies like - Bharti Airtel, Idea Cellular, Uninor and Vodafone

Further, the Indian Communications Industry analysis suggests that the products and services offered by this industry is not confined to basic land line connections but it also includes facilities like Internet, broadband (both wireless and fixed), cable TV, SMS, Internet Protocol TV (IPTV), soft switches etc.

The Communication Companies in India are on the ever rising trend and there has been a stupendous growth in this sector over the last decade. The telecommunication industry in India is one of the rapidly growing industries in the world and has also developed the second largest communication network.
Growth in the Indian Telecom Sector

The state owned Bharat Sanchar Nigam Limited (BSNL) has been the pioneer in the telecom market of India. The Indian telecommunication policies were further modified to introduce more private telecom players in the market. Several private companies as Bharti Airtel, Reliance Communications, Tata Indicom, Aircel, Vodafone, Idea Cellular joined the Indian market. As of the figures of March, 2011, the mobile phone sector in India registered 20.21 million numbers of new users a month. The overall density in the telephone sector has increased to 70.89% as indicated by the recent figures of March 2011.

Major Telecom Companies in India

In 1975, the Department of Telecom (DoT) was given separate authority for running the telephone services in the country. Mahanagar Telephone Nigam Limited (MTNL) initiated its services in the year 1985 for carrying out the telephone operations in the metros of India, viz. Delhi and Mumbai. In October 2000, the Bharat Sanchar Nigam Limited (BSNL) was set up by the Department of Telecom. Thereafter several private companies as Reliance Communications, Tata Indicom, Airtel etc in the sector came up.

Telecom Sector Policies in India

A Communication Convergence Bill was introduced in the Parliament in 2001. Unrestricted entry is allowed in National Long Distance Service (NLD). Also the International Long Distance Services (ILDS) have been kept opened. Cellular operators have the permission of providing all types of service, as voice and non-voice messages, data services etc. The New Telecom Policy revised in 1999
encourages participation of private companies in services as Global Mobile Personal Communication by Satellite (GMPCS) Service, digital Public Mobile Trunked Service (PMRTS) and Voice Mail/ Audiotext / Unified Messaging Services. To fulfil Universal Service Obligation (USO) funding and administration, several measures are being taken. To initiate Community Phone Service, an announcement has been made. Guidelines regarding the Multiple Fixed Service Providers (FSPs) have been announced. For establishing International Internet Gateways, which include both Satellite and Landing Stations, the Internet Service Providers (ISPs) have been permitted. The Government of India also has set up various guidelines to establish Internet telephony (IP).

Stupendous growth in Mobile phone subscribers all across the country over the last decade and a half has been a major enabler for the growth of Indian economy. The growth story is depicted in the Table 3.5 below.
Table 3.5 Growth of Mobile telephone subscribers in India during the last decade

<table>
<thead>
<tr>
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<td>2,930,000</td>
<td>26,154,400</td>
<td>69,193,000</td>
<td>296,080,000</td>
<td>362,300,000</td>
<td>752,000,000</td>
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</table>

3.14 The Indian information technology (IT) sector

The Indian information technology (IT) industry has played a major role in placing India on the international map. The industry is mainly governed by IT software and facilities for instance System Integration, Software experiments, Custom Application Development and Maintenance (CADM), network services and IT Solutions. According to Nasscom's findings Indian IT-BPO industry expanded by 12% during the Fiscal year 2009 and attained aggregate returns of US$ 71.6 billion. Out of the derived revenue US$ 59.6 billion was solely earned by the software and services division. Moreover, the industry witnessed an increase of around US$ 7 million in FY 2008-09 i.e. US$ 47.3 billion against US$ 40.9 billion accrued in FY 2008-09

**IT Outsourcing in India**

As per NASSCOM, IT exports in business process outsourcing (BPO) services attained revenues of US$ 48 billion in FY 2008-09 and accounted for more than 77% of the entire software and services income. Over the years India has been the most favourable outsourcing hub for firm on a lookout to offshore their IT operations. The factors behind India being a preferred destination are its reasonably priced labour, favourable business ambiance and availability of expert workforce. Considering its escalating growth, IBM has plans to increase its business process outsourcing (BPO)
functions in India besides employing 5,000 workforces to assist its growth. In the next few years, the industry is all set to witness some multi-million dollar agreements namely:

A 5 year agreement between HCL Technologies and News Corp for administering its information centres and IT services in UK. As per the industry analysts, the pact is estimated to be in the range of US$ 200-US$ 250 million. US$ 50 million agreement between HCL Technologies and Meggitt, UK-based security apparatus manufacturer, for offering engineering facilities. Global giant Wal-Mart has short listed there Indian IT dealers namely Cognizant Technology Solutions, UST Global and Infosys Technologies for a contract worth US$ 600 million.

*India's domestic IT Market*

India's domestic IT Market over the years has become one of the major driving forces of the industry. The domestic IT infrastructure is developing contexts of technology and intensity of penetration. In the FY 2008-09, the domestic IT sector attained revenues worth US$ 24.3 billion as compared to US$ 23.1 billion in FY 2007-08, registering a growth of 5.4%. Moreover, the increasing demand for IT services and goods by India Inc has strengthened the expansion of the domestic market with agreements worth rising up extraordinarily to US$ 100 million. By the FY 2012, the domestic sector is estimated to expand to US$ 1.7 billion against the existing from US$ 1 billion. The Indian government has established a National Taskforce on IT with an aim of formatting a durable National IT Policy for India. Endorsement of the IT Act, which offers an authorized structure to assist electronic trade and electronic operations is considered an enabler for further growth.

*Future of Indian IT Industry*
The Indian IT sector persists to be one of the flourishing sectors of Indian financial system indicating a speedy expansion in the coming years. As per NASSCOM, the Indian IT exports are anticipated to attain US$ 175 billion by 2020 out of which the domestic sector will account for US$ 50 billion in earnings. In total the export and domestic IT sector are expected to attain profits amounting to US$ 225 billion along with new prospects from BRIC nations and Japan for its outsourcing operations.

3.14 Infrastructure Sector

Infrastructure Sector Growth Rate in India GDP has been on the rise in the last few years. The Growth Rate of the Infrastructure Sector in India GDP has grown due to several reasons and this in its turn has given a major boost to the country's economy.

India gross domestic product (GDP) means the total value of all the services and goods that are manufactured within the borders of the country within the specified period of time. The Indian economy is the twelfth biggest in the whole world for it has the GDP of US$ 1.09 trillion in 2007. The economy of India is the second major growing economy in the whole world for it has the GDP growing at the rate of 9.4% in 2006-2007. The Infrastructure Sector in India was after independence completely contributed by the public sector and this limited the growth of this sector. India's meagre investment on real estate, power; telecommunications, construction, and transportation prevented the country from sustaining very high rates of growth. The amount that India was spending on the Infrastructure Sector was 6% of GDP or US$ 31 billion in 2002.
Infrastructure Sector Growth Rate in India GDP came to 3.5% in 1996-1997 and the next year, this figure was 4.6%. The Growth Rate of the Infrastructure Sector in India GDP increased after the Indian government opened the sector to 100% foreign direct investment (FDI). This was done in order to boost the Infrastructure Sector in the country. The result of opening the sector to the private sector has been that Infrastructure Sector Growth Rate in India GDP has increased at the rate of 9%. It is estimated that the Growth Rate of the Infrastructure Sector in India GDP will grow at the rate of 8.5% between 2006 and 2010. The biggest on-going project in the Infrastructure Sector in India is the Golden Quadrilateral, which is improving the main roads that connect the four cities of Chennai, Mumbai, Delhi, and Kolkata. Infrastructure Sector Growth Rate in India GDP thus has increased over the last few years due to the efforts that have been made by the Indian government. Government of India would continue to take steps to improve the Infrastructure Sector in the country as this in its turn will help to boost the Indian economy in future.

3.15 Conclusion

From the discussion above it is clear that Indian companies both in private and public sector have come a long way in contributing to the fast economic growth of the country. Government interventions particularly during the initial years of independence (1950 to 70) in setting up large irrigation projects particularly to help Agriculture contributed in making the country self-sufficient in food. Next establishing public sector establishments, national research labs and Heavy industries contributed to the growth in Manufacturing and a wide range of Technologies that reduced the dependence on foreign countries particularly in area of defence, telecommunication, health, space and science. Investments in infrastructure like good
roads, railways and bridges ensured movement of finished goods and raw material to the factories. Opening up of the economy in 1990’s saw FDI’s investing in India fuelling the growth of service sector particularly in IT and Telecom. These growths have been made possible with implementation of projects all across the length and breadth of the country in all the sectors mentioned above. Each sector has a story to tell and a lesson learnt that need to be shared for the benefit of other practitioners and researchers.

Case studies in well-known companies that have implemented project management techniques across some of the fast growth sectors like Infrastructure, Telecom and IT both in Government, public sector and private are attempted in the next chapter precisely with this intention in mind. Each of the case study have a story to tell as we trace the growth of the particular company, environment in which the growth happened, challenges faced during the various stages of growth and eventually the current issues that face the management. Project Management at these companies have been developed into a fine art as also using the tools and techniques of technology particularly enablers like office automation tools, IT software systems and Telecommunication aids.