Structure of Indian Software Industry

In the previous chapter we have argued that software products and services offered by Indian industry is low value/low risk/low skilled activity segment in the value chain. Such product and services baskets have a compatible industry structure, which is the direct consequence of the export centric product and services offered by the industry. In other words, the value of products and services offered by the software industry suggests that the basic dynamics of the industry is cost competition and not competitive advantage based on knowledge creation. Dynamics of cost advantages are low entry barrier, large number of small firms, fragmented market structure etc. In Schumpeterian view, high cost of innovation and knowledge creation can not be borne by fragmented market. The sufficient condition for any innovation to take place is the market power of big firms and economic rent accruing from the market power (Nath, 1993).

In chapter II we have listed down Reinert's (1994) "Quality Index of Economic Activities" by segregating characteristics of high and low quality activities. We have observed that low barriers to entry, divisible investment, fragmented industry, perfect competitions, low R&D content, little technological progress etc. characterize the low quality/low knowledge intensive activities. Recent theoretical insights of growth process delineate that if firms in the industry focus on low knowledge intensive activities and stick to comparative advantage in activities whose capabilities have become commonplace, growth of the industry is likely to be non-sustainable. With this basic understanding, in this chapter, we would examine the traits of Indian software industry in terms of the barriers to entry in the market, size of firms and market power, international competitiveness, technology competency, etc. This chapter also briefly analyzes the

governmental support system in the light of the specific traits of the Indian software industry.

Reliable data on the firms in the software industry is difficult to obtain. There are two major data sources pertaining to software firms. The first is Dataquest, the second is National Association of Software and Service Companies (NASSCOM)[22], India's quasi-governmental software industry promotion organization. NASSCOM provides more detailed information with considerable depths as compared to that of Dataquest. For this section, we shall begin with an analysis of software industry structure based on NASSCOM data.

4.1 Entry Barrier

Entry of a new firm plays an important role in shaping industry structure in certain phases of product life cycle. It also indicates the competitive condition prevailing in the industry. What are the conducive conditions that make new entry in an industry possible? The traditional equilibrium based view is that a new firm enters when incumbent firms in the industry earn supernormal profits. Entry restores the profit to the long-run equilibrium level by expanding industry supply and depressing price. Thus in equilibrium based theories, entry serves as a mechanism to discipline incumbent firms. The alternative characterization of entry is based on innovation and cost of firm's growth (Geroski 1995, Hause and Rietz 1984). Here entry is less a mechanism for keeping prices down and more a mechanism for bringing about changes associated with innovation and thus having higher market share offering differentiated products in the market. Entry is

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[22] NASSCOM data is compiled from firm-level data. As of 2001, about 850 software and service companies have NASSCOM membership and they accounted for about 95 per cent of the revenue of the software industry in India. It is claimed that there is hardly any software company in India which employ more than 20 professionals and is not a member of NASSCOM.

often used as a vehicle for introducing new innovations in the early phases of industry evolution and thus plays important role in shaping industry structure. Innovation therefore is linked to the ability of firms to differentiate themselves from others. With this theoretical understanding, we investigate factors that influence the entry of software firms in the Indian industry.

Previous chapter indicates that Indian software firms operate in low risk/ low skill areas. Entry of firms into the Indian software industry depended on overseas contacts (especially in the US market), rather than introducing innovative products into the market. Inroads into these overseas contacts was most probably made by the NRI technologists in the US and their alma mater in India. After a few initial successes, which helped them get new business, the process had rapidly spread industry-wide to create the present size of Indian software industry. To support this industry, associated education/training and telecommunication infrastructure had also grown up. Improvement of telecommunication system helped faster on line data communication to and from India, thus making Indian resources more easily accessible from the US. This was the single most important infrastructural facility that helped boost up the software business manifolds. Thus the Indian software industry was not created by any major process or product innovation by new entrants, but was a result of budding new overseas contacts.

With the growth of necessary infrastructure in India, there was no dearth of 'contractible jobs' from the US for the Indian software industry. The main dynamics of the industry, however, has been that of a perfectly competitive market where supply is to be governed by a ruling price. Being low investment-low value-low skill jobs, it was

manpower cost that determined the price of the services. And at the ruling price, there was no entry barrier for any firm having any contact in the US market. India enjoyed the advantage of being low wage as compared to that in the developed countries. Thus there was growth in volume of business in the low skill job area independent of the expansion of the core competence of the industry. This resulted to a flock of firms entering the industry in the boom period without the need for introducing new innovative products in the market. D'costa (2002) likewise argued that given the strategies of MNCs and the commercial attractiveness of export markets, Indian firms were unlikely to pursue strategies that would lead to significant innovative capability. It was, therefore, not the technological innovation for new or differentiated products that was used by the early entrants in the Indian software industry. It was, on the contrary, the ability to employ manpower at cheaper rate for contracted job that created the backbone of the industry.

**Table: 1 Entry of New Software Firms in the Industry**

Year of Entry in the Software Industry	No. of Firms (Per cent)
1976 – 1980*	33 (6.90)
1981 – 1985	39 (8.14)
1986 – 1990	89 (18.58)
1991 – 1995	182 (38.00)
1996 – 1999	131 (27.35)
No information	5 (1.04)
Total	**479 (100.00)**
Source: Indian IT Software & Services Directory, NASSCOM, (1999-2000)	

* Note: Most of the firms before 1980s are actually those who diversified to software business from their old line of businesses.

Table 1 shows the entry of new firms in the industry. The expansion of the market during 80s onwards witnessed large-scale entry of new firms in software segment. New

entry peaked during late 80s and the early 90s. About 84 percent firms have entered since mid-80s. The average age of firms is about eight years. However, there are firms who are as old as 80 years. Most of these firms retained their old names for running their new software business. The cumulative entry of firms is depicted in figure: 1.

Figure: 1 Cumulative Entry of Software Firms in the Industry
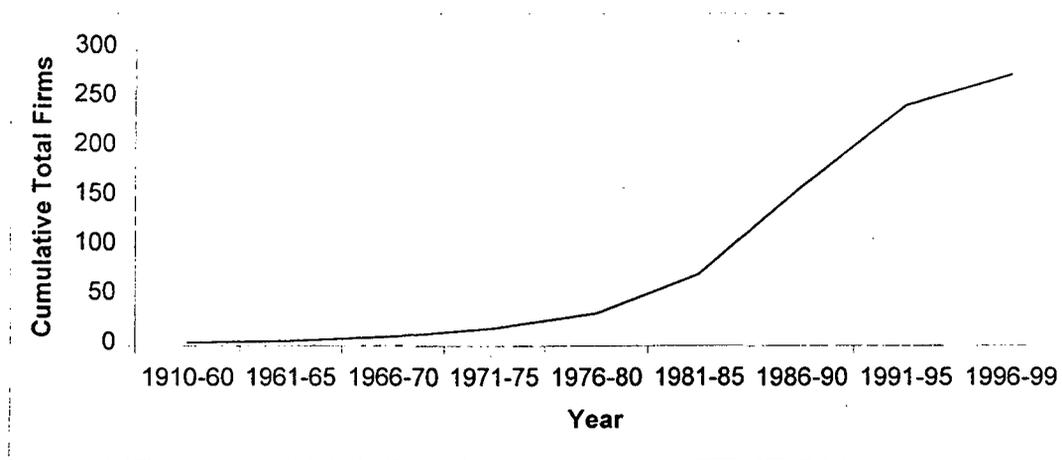
Source: Indian IT Software & Services Directory, NASSCOM, (1999-2000)

Mass entry of firms in the industry since mid 80s has to be understood from the type of products and services being offered by the industry (discussed in detail in previous chapter). Most software companies in India act as sub-contractors, executing assignments either onsite at the client's premises or offshore at development centers in India. Onsite services abroad or manpower contracts have opened up another easy route to entry into the industry. People engaged in such contracts get exposure to state-of-the-art hardware and software platforms, which are not available in India. They also get exposed to the business opportunities, trends and a basic understanding of the nature of overseas market including valuable contacts, thus helping them to start their own ventures back home. Such contacts and exposures also help in striking foreign collaborations or securing agencies of foreign firms for the domestic market. Moreover

collaborations and agencies facilitate in accessing new hardware and software platforms and in securing work contracts overseas. Schware (1992) observed that people who established such firms have also spent substantial time in the US trying to find more business.

Table: 2 Authorized Capital-wise No. of Firms

Authorized Capital (in million Rs.)	No. of Firms (per cent)
Less than 1	31 (6.47)
Less than 5	67 (13.99)
Less than 10	39 (8.14)
Less than 30	77 (16.08)
Less than 50	29 (6.05)
Less than 100	69 (14.41)
Less than 200	53 (11.06)
Less than 500	27 (5.64)
Less than 1000	11 (2.30)
More than 1000	6 (1.25)
No Information	70 (14.61)
Total	**479 (100)**
Source: Indian IT Software & Services Directory, NASSCOM, (1999-2000)	

Scale economies, absolute cost advantages and product differentiation advantages therefore were not deterrents for new entrants. As a result small and tiny firms have entered the business quite easily. Unlike high capital cost, which works as a formidable entry barrier in the traditional industries, access in the software segment is easier because of the low capital requirement for commencing operation in this industry. Also, investment in the software sector is characterized by divisibility as opposed to investment in large chunk in traditional industries. Table 2 shows the authorized capital of the Indian software firms. It is interesting to note that more than 65 per cent firms have less than Rs.100 million authorized capital. Only 1.25 per cent of total firms has capital base more

than Rs. 1,000 million. The average authorized capital of firms is less than Rs. 89 million. Thus low capital cost has created opportunities for small and tiny firms for entering into the market easily.

4.2 Size of Firms

The steady inflow of small and tiny firms has created a long tailed structure of the industry. The structure of software industry, therefore, is not much different from the other long established Indian industries studied by Desai (1982). Table 3 shows annual turnover-wise (which indicates size of firm) number of firms in software industry. In 1998-99, as shown in the Table 3, about 60 per cent of total software firms have annual turnover of less than Rs150 million. Only 5 per cent have turnover more than Rs 1,000 million.

A positive skewed frequency distribution is seen wherein a long tail of the distribution is towards the higher values of the variable, indicating that a smaller number of firms predominate the higher turnover range. Market share of largest firms has declined from about 20 per cent in 1988-89 to about 10 per cent in 1998-99. This indicates that smaller firms (and probably new firms) have eaten away the share of the large firms. The smallest firm has a 0.00001 per cent share of the market. Table 4 shows the market share-wise number of firms in the software industry. Here we measure market share as percentage share of total turnover (in 1998-99) of software firms. It is clear from the table that around half of the total firms has a market share of just 0.05 per cent. Only 2.5 per cent of firms could manage to grab more than 1 per cent market share.

This indicates that most of the firms are small and tiny. They are not large enough to attain market power. Their incentive to innovate to attain higher profit is negligible as

turnover is meager. The size of the firm is a critical factor in Schumpeterian scheme of technological innovation, where a firm can innovate if it has enough market power to capitalize on that innovation (Schumpeter 1934). The general expression of the Schumpeterian hypothesis is a positive relationship between firm size and innovation (Nath 1993). In the light of Schumpeterian hypothesis we can argue that structure of the Indian software market is not conducive to innovation and, therefore, vulnerable to long run sustainability.

Table: 3 Turnover-wise Number of Firms in 1998-99

Turnover (in million Rs.)	Total no. Of firms (per cent)
Less than 5	64 (13.36)
5 to <10	24 (5.01)
10 to <25	61 (12.73)
25 to <50	47 (9.81)
50 to<100	46 (9.60)
100 to<150	35 (7.31)
150 to<200	17 (3.55)
200 to<300	20 (4.18)
300 to<400	17 (3.55)
400 to<700	11 (2.30)
700 to<1000	10 (2.09)
1000 to <2000	15 (3.13)
2000 to <5000	5 (1.04)
More than 5000	5 (1.04)
No information	102 (21.29)
Total	**479 (100)**
Source: Indian IT Software & Services Directory, NASSCOM, (1999-2000)	

Table: 4 Market share-wise Number of Firms

Market Share	No. of Firms (per cent)
0.0001 – 0.0050	82 (17.12)
0.0051 – 0.0100	40 (8.35)
0.0101 – 0.0500	105 (21.92)
0.0501 – 0.1000	54 (11.27)
0.1001 – 0.1500	19 (3.97)
0.1501 – 0.2000	17 (3.55)
0.2001 – 0.3000	13 (2.71)
0.3001 – 0.5000	16 (3.34)
0.5001 – 1.0000	19 (3.97)
1.0001 – 2.0000	6 (1.25)
2.0001 – 5.0000	5 (1.04)
5.0001 and above	1 (0.21)
No Information	120 (21.29)
Total	**479 (100.00)**
Source: Indian IT Software & Services Directory, NASSCOM, (1999-2000)	

A similar structure is seen in the case of export earnings. Table 5 shows the distribution of firms according to their export volume. Interestingly, about half of the firms have export earnings of less than Rs. 150 million. Among the software-exporting firms, less than 4 per cent firms are earning more than Rs. 1,000 million. Export is lucrative for software firms, not for producing high value added products, but for offering low-end services, which is observed in Chapter II. The phenomenal increase in export growth is because of growing worldwide demand of low-end services, and the comparative advantage that India has on account of its highly skilled, relatively low cost, English speaking manpower.

Table: 5 Export-wise Number of Software Firms

Exports (in million Rs.)	Total no. of Firms (per cent)
Less that 5	65 (13.57)
5 to < 10	23 (4.80)
11 to < 25	50 (10.44)
26 to < 50	33 (6.89)
51 to < 100	41 (8.56)
101 to < 150	24 (5.01)
151 to < 200	19 (3.97)
201 to < 300	12 (2.51)
301 to < 500	14 (2.92)
501 to < 1000	19 (3.97)
1001 to < 2000	9 (1.88)
2001 to < 5000	6 (1.25)
More than 5000	4 (0.84)
No Information	160 (33.40)
Total	**479 (100.00)**
Source: Indian IT Software & Services Directory, NASSCOM (1999-2000)	

The structure of Indian software industry is strikingly similar to that of the rest of the traditional industries in India. Implication of such a structure on technological capability of the industry has been well argued [Desai (1982); Siddharthan (1988); Nath (1993)]. Briefly, these studies suggest that major R&D expenditure and technological innovation are not likely events in an industry where all the firms (large or tiny) are offering similar products and services, and where the main market dynamics is price competition. Extending Arrow's (1971) argument, it has been observed that large and small firms alike are likely to be engaged only in cost reducing minor innovations. From this perspective, the prospect of Indian software industry to move up the value chain in the activities involving high investment/high R&D/high risk/high value looks quite distant. The same view has been echoed in a survey article in Business India (2002) that says, "move up the value chain is going to be difficult for IT companies". "And many

may be happier where they are; they may not want to make the transition. After all, there will always be demand for cooks in Dubai".

4.4 Technology Competence

The structure of any industry would be well understood if one could explore the technological capability developed by firms operating in the industry. According to Lall (1987) "Technology is the application of scientific knowledge and skills to the setting up, operating, improving and expanding productive facilities." Acquiring these capabilities is known as technological capability. An important feature of software industry is rapid and sustained technological innovation. Most software products have a limited life span. As technological changes sweep the industry, software originally developed for one platform fails to meet user requirements on the changed platform.

India is left far behind technologically in view of rapid global development. According to Katz (1985), "in order to benefit from technical knowledge, firms or countries need to develop their own technological capabilities, and ... different firms or countries do this at different rates with various success." Incentive to innovate, and therefore, innovative behavior of firms is likely to be different in different types of market structure. With this understanding, in this section, we would like to investigate the technological competency developed by the Indian software firms. Our intention is to understand whether local firms are merely providing low-end services for their clients or increasingly adding value to their services by upgrading their innovation capacity.

Technical specialization developed by Indian firms is perhaps one good measure of technological capability building. NASSCOM has attempted to classify the companies according to their 22 different technical areas of specialization and their expertise in 18

relevant application areas. Table: 6 portrays the technical specialization-wise number of firms in the industry. Specialization ranges from the low technology Y2K, various enterprise resources planning (ERP) packages to complex CAD/CAM, telecom and chip design. It is interesting to note that the maximum number of firms specialize in web technologies, Internet and Intranet. More than 66 per cent of total firms fall in this classification. Other crowded areas of specialization are software product development, E-commerce/EDI, software maintenance and migration, RDBMS, ERP/MRP solutions, where at least 40 per cent of total firms are pursuing their activity in each category. Large number of firms concentrate to cater legacy problems, which are considered as low value-added software services. These include providing Y2K compliance, conversion projects (moving from one system to another), Euro and variety of data conversion. These kind of specializations are labor intensive and require low value added services such as low level of programming and coding, testing and maintenance. During 1998-99, exports of Y2K software solutions alone comprised about $560 million or 21 percent of total export (D'costa 2002).

As we discussed earlier, the revenue of software firms depends on the number of projects they can get from the customers abroad (mainly USA). Indian firms always try to be dependent on many clients as opposed to just a couple of clients. The reason for this is perhaps that these firms would lose a significant chunk of their business if just one of the couple of clients pulled out. As a result, firms try to chase lots of clients and lots of projects, to make sure that no one project or client accounts for a large percentage of total revenue at any point of time. Firms also chase projects in various specialization avenues in the industry to make sure that they are never too tightly linked to the fortunes of a

single sector. Probably for the above reasons, we found firms specializing in many technical and application areas.

Table: 6 Technical Specialization-wise Number of Firms

Specialization	No. of Firms (per cent)
Computer Games / Computer Graphics	17 (3.55)
Chip Design / Microprocessor / ASIC	29 (6.05)
CD ROM Publishing / Multimedia	45 (9.39)
GIS / Imaging	55 (11.48)
Localization of Software	59 (12.32)
CAD / CAM / CAE	60 (12.53)
Facility Management	68 (14.20)
Dataprocessing / Dataconversions / Medical Transcription	75 (15.66)
Web Content Development / Back Office Operations	102 (21.29)
IT Education and Training	107 (22.34)
Product Distribution / Support / Implementation	124 (25.89)
Euro Currency Solutions	132 (27.56)
Telecom Solutions / Communication Software	132 (27.56)
Year 2000 Solutions	161 (33.61)
Business Process Consultancy / Re-Engineering	168 (35.07)
System Integrations / Networking	192 (40.08)
ERP / MRP Solutions	200 (41.75)
RDBMS / Datawarehousing / Datamining	217 (45.30)
Software Maintenance and Migration	234 (48.85)
E-Commerce / EDI	242 (50.52)
Software Product Development	286 (59.71)
Web Technologies / Internet / Intranet	319 (66.60)
Source: Indian IT Software & Services Directory, NASSCOM (1999-2000)	

However there are areas of high technology specialization where only a handful of companies are engaged. About 3.55 per cent of total firms are engaged in making computer games and computer graphics. The number of firms is less in this area because the size of the market associated with this specialization is small. Companies occupying this technical specialization are essentially international IT services company setting up their operations in India with proper development facilities. These companies' strength lie in the strength of its team of highly skilled and experienced professionals. Except very

few, most of these companies are small in terms of turnover. The average turnover of these companies reported in 1998-99 was as low as Rs. 38.54 million, as compared to the average software industry turnover of Rs. 307.66 million. Chip design, microprocessor, application specific integrated circuit design etc. are other high technology areas where very few (only 6 per cent of total) firms are enlisted. Multimedia (less than 10% of firms) is also a growing area, which is technically challenging.

However, it would be wrong to see Indian companies as devoid of technological capability. Several firms like Wipro and BFL have developed system integration capability because of the need to interface India-made software for Japanese hardware. Tata Infotech through its many alliances with well-known US firms has also developed considerable system integration competency (D'costa 2002). But other than some large public sector firms such as CMC and C-DOT, most of the firms engage in projects to increase level of productivity of their foreign clients. CMC and C-DOT have developed project experience with design and implementation of large-scale projects for the domestic market. CMC has developed the software to automate Indian railway reservation system. C-DOT has made its emblem in telecommunication hardware for the rural sector. But as a whole, almost all firms operate at the lowest level of value chain or in the market that has become standardized. The entry of new firm into the market does not need any knowledge advantage. Companies are expected to move up the value chain, by putting the experience gained in executing service contracts to productize service[23],

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[23] Where service activities are similar, the service provider would gain by productizing his services so that he only needs to "customize" it to client requirements. This has benefits for the client also, as it reduces project time and associated cost.

develop niche products[24] etc. None of these has happened for most of the software firms in India.

It is interesting to notice that the general intention of firm is not to specialize in a particular technical area but to diversify its specialization. A clear picture emerges from

Table: 7 Size-Class Distribution of Specialization

Number of Specialization	No. of Firms
1 to 4	180 (37.58)
5 to 8	165 (34.45)
9 to 12	92 (19.21)
13 to 16	34 (7.10)
17 to 20	8 (1.67)
Grand Total	479 (100)
Source: Indian IT Software & Services Directory, NASSCOM (1999-2000)	

table: 7, which highlights size-class distribution of specialization. About 9 per cent of total firms specialize in only one category. Most of these firms are fully owned subsidiary of foreign company and quite a few of them are 100 percent export oriented unit. These firms are not large in terms of annual turnover. Their average turnover in 1998-99 was Rs. 146.8 million, which is almost half of the average industry turnover. Firms generally try to diversify their specialization just to grab higher market share. However, no firm has been found to specialize in all 22 categories. About 1.67 per cent of firms specializes in more than 16 different technical areas. The average turnover of these firms is Rs. 1,307 million, which is around four times higher than the average industry turnover. This shows

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[24] Niche products are products which cater to some specific segments of IT users, for example products for the banking industry. Niche products are built around a company's core competence, either acquired through offshore contracting experience or the experience of the personnel behind the development. This considerably reduces uncertainties, though huge volumes are not generated.

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that the firms having many specializations are quite large in terms of turnover. Most of these firms are global IT service companies concentrating mainly to provide software service and solutions in overseas market. In fact, a particular firm's specialization depends upon the type of onsite contract or offshore project they are getting from their clients which indicates that the specializations are expost.

Two distinctly noticeable features are : (a) large number of firms having the same kind of specialization and having the same kind of jobs. This indicates that firms are not distinguishable in terms of firm specific skills. (b) one firm taking up varieties of jobs that are unrelated to each other. This indicates that the activities do not need any specialized skills. Or the firm is doing that component of job where skill is brought down to its lowest enough level.

4.5 Government Contribution

Being impressed by the excellent export performance of the Indian software and service industry, the Government of India has initiated to take market driven policies and providing all support, including fiscal benefits, the availability of high-speed data communications and infrastructure, besides ensuring an almost red tape-free system. The Government in fact has granted the velvet-glove treatment to this industry. However, the much-needed initiative to develop technological competence for long run sustainability of this industry has not yet taken place. It is the technology, which plays a critical role for sustainable development of software industry, rather than the physical infrastructure.

Software driven IT industry is today at the top of India's national agenda as an instrument and a model, for the modernization of India's economy. But whether an industry entirely depending upon export-led growth and ignoring to tap the domestic

market will be able to survive in the future and sustain phenomenal growth as well as competitiveness in the global economy – remains a big question.

According to the World Bank report in 1992 for the Department of Electronics on 'India's Software and Services Export Potential and Strategy', India's software service exports would increase because of increasing share of 'foreign opportunity' and pool of skilled manpower. These would help to increase FOREX earning along with further skill up gradation. As a result of which the domestic market would develop which in turn would improve the latter. In this way the IT related productivity and economic competitiveness would improve. However, Indian IT development strategies have so far mostly focused on attracting foreign investments into the local IT industry and exploring market opportunities in the western hemisphere which is clearly reflected from the export share. More than 60 per cent of India's software revenues comes from exports. In fact the increase in the size of the domestic IT market is largely due to the booming demand for imported IT product. In 1999, the joint studies on Indian IT industry by McKinsey Co.[25] and NASSCOM reveals some major targets for software segment. One of these targets is to achieve US $85 billion software revenues by 2008, which is also relied on exports. The projected figure for export is $50 billion by 2008, of which $8 billion is expected to come from export of products. As a result of this emphasis on export-led strategies, the huge

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[25] McKinsey – the US based management consultant outfit – released its report with NASSCOM about Indian software industry and literally raised the expectation from the industry overnight. According to McKinsey the IT industry has the potential to reach a size of US $87 billion (approximately Rs. 3,50,000 crores) by 2008. Software exports alone would reach US $50 billion from the present level of US $4 billion. McKinsey also expects market capitalization of the IT sector to go up to US $225 billion from the current market cap of about US $27.3 billion – a two hundred times increase – in the next 8 years. The study also points out the bottlenecks that need to be overcome in this regard. (17 December, Hindustan Times).

local IT market remains underdeveloped. It has been argued in many studies that in a large country like India, with a big population, low IT awareness and underdeveloped IT infrastructure – need to equally focus on creating local demand for IT products and services in addition to their IT export strategies to assure IT-led growth for the entire economy (Arora et al 2001, Kumar 2001, Joseph et al 2001). Negligence of the domestic market, however, is bound to lead to serious consequences in the long-term, if not in the short-term.

China, for instance, is both a large user as well as producer of information technology. It is based on a dual strategy that aims both to support local demand and integrate their local IT industry into the global economy. As a result, China's IT market is a fastest growing IT market in Asia. The overall IT market in China reached US $10 billion in 1998, the second largest in the Asia-Pacific region excluding Japan. China has more than 3000 software companies, most of them catering to the local market due to a serious problem with exports which needs availability of English speaking manpower, perhaps a blessing in disguise for them. Contrary to this, in India, most big players neglect the domestic software market. This is because the industry finds it more lucrative to cater to foreign clients, who are willing to pay higher fees rather than developing products for the Indian market. Given its breakneck speed, managing this industry is a challenge. Companies that are building a global marketing base, investing in infrastructure and R&D are expected to have better sustainability as compared to those that focus purely on getting more projects and recruiting more employees.

Government's contribution towards development of IT infrastructure has strengthened the export oriented structure of Indian software industry. As we have argued

in the earlier chapter, the Indian software industry is devoid of any strong linkages with the other manufacturing sectors of the country. As a result, the high tech area of embedded software remains elusive for Indian software industry. The industry, therefore, remains perpetually dependent on the vagaries of the export market based on low wage advantage. Being unable to move in to the high skill segment of the industry, long-term sustainability appears to depend on India's ability to remain a low wage source of skilled manpower.

4.6 Summary and Observations:

In a nutshell, what we have narrated above is that Indian software industry is essentially surviving on advantage of low labour cost. The basic dynamics of the industry is cost competition and not competitive advantage based on knowledge creation. Entry of new firms in the industry does not need any knowledge advantage. There exist many firms engaged in different specialization. This indicates that firms do not have special technical capability that can provide them competitive advantage and thus higher profit from other firms. The performance of firms varies depending on the ability to strike foreign collaboration, or acquiring agencies of foreign firms. The revenue of firms depends on the number of projects they can get from the US customers. Firms having more foreign contracts and thus longer experience in the market are expected to do better than the new entrants.

We have noticed that in absence of a vibrant domestic market, the Indian software industry is dependent on external clients. Firms move on to reproduce their commercial success, more prone to associate themselves tightly (through agency and collaboration) to client-driven, externally generated demand. This connotes that software industry of India

is a part of global software industry and its growth is actually derived from the growth of global industry - it does not create its own growth. So the long run sustainability depends on its ability to sustain low cost advantage as opposed to competitive advantage by creating new knowledge. The low cost advantage is derived from the following factors:

❑ Industry is manpower dependent

❑ India has a large pool of skilled manpower

❑ The cost of manpower is low

In the next chapter we examine the basic feature of the Indian software industry as of high skilled manpower used for low skilled jobs to retain the cost advantage.