The evolution of India as a major exporter of knowledge intensive services, along with its spillover benefits of creating employment and developing a new pool of entrepreneurship, fundamentally rests on the spectacular rise of the IT software and services industry during the 1990s. The knowledge economy of India is based on three fundamental characteristics (Sengupta and Neogi, 2008):

(i) **Knowledge Capital** which refers to (a) software development (b) blueprints and design (c) R&D knowledge as innovations (d) human capital and skill in adopting new technology from abroad and improving it.

(ii) **Competitive Efficiency** refers to the market process by which entrepreneurs compete to exploit knowledge capital to improve their profitability.

(iii) **Open trade based on comparative advantage theory** Openness in trade involves competition to improve domestic efficiency, the adoption of leading edge technology and the exploitation of human skill and knowledge spillover from the international field.

The development of IT (information technology) has played a pivotal role in exploiting India’s comparative advantage. In fact IT refers to a whole gamut of things including digital processing, storage and communication of information of all kinds. So, one must discuss the evolution and the development of the IT-software and services industry while considering the detail of the offshore outsourcing in India.

Indian software and services industry, which began its journey in 1974, is one of the world’s successful IT exporting industries. As of March 2004, there were 3000 firms (approx.) employing 5,33,500 people of which the ten largest firms accounted for 41 per cent of total exports. The configuration of the Indian software industry shows that its clients are firms rather than retail consumers. Product software i.e. software written for general use such as Windows operating system or Microsoft Word are mostly used by
retail users and small firms. This software is intended to be replicated in its original form across many users. In case of large business houses they not only need product software for purposes such as managing hardware (operating systems, utilities, drivers etc) but for standardized applications such as word processing they require customized software for interpersonal / inter-organizational communication for routine operation and management. It is a part of a larger category called software services, which includes simpler work such as deploying hardware and software, training and system maintenance, but also more complex work such as integrating pieces of product and custom software into a working system and a range of outsourced managed services such as e-mail, network management, R&D and customer care.

2.1 Salient Features of Growth of the Indian Software Industry

1. First, the Indian software success is a rare example of services rather than manufactured goods being exported successfully from a developing country. Also unusual is the fact that it occurred in custom software rather than product software.

2. Authors like Heeks (1995, 1996), Brunner (1991), Schware (1991) characterize the initial phase of development of the software industry in India as low value, low skill, low investment activities. So many contemporary studies suggested diffusion of IT use in various domestic industries along with better arrangement of infrastructural facilities and constant supply of skilled manpower for sustaining the gains from the software industry.

3. Export sales have been crucial to the rise in industry revenues. More than two-thirds of the software industry’s sales in 2000 were due to export sales, and this percentage continues to climb with exports accounting for nearly 80 per cent of industry sales in 2001-02.

4. Sharp growth in the mid 1990s and the slowing down of growth after 2000 can be observed. Thus, the compounded annual average rate of growth of software revenues for the period 1995-2000 was 37.5 per cent per annum compared to 14.5 per cent per annum recorded in the period 2000-2002.
5. Few realize that even as far back as 1984 Indian software was producing export revenues. Although in comparison to the revenues earned in the mid 1990s this early revenue was somewhat insignificant, it did exist, suggesting that the industry was established more than a decade before the export boom.

6. Unlike the Irish software industry, domestic rather than foreign firms led Indian software growth. India's software exports are largely the products of Indian firms. Of the top twenty exporters in 2000-01, only 5 firms are subsidiaries of foreign firms.

7. The Indian software industry has retained a largely competitive structure. We can see from Table 2.1 that the top five and top ten firms have always accounted for a low proportion of industry sales: this is reported in the last two rows as CR5 and CR10.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TCS</td>
<td>13.44</td>
<td>12.28</td>
<td>11.43</td>
<td>8.35</td>
<td>8.32</td>
</tr>
<tr>
<td>Wipro</td>
<td>5.01</td>
<td>5.64</td>
<td>4.44</td>
<td>4.41</td>
<td>5.21</td>
</tr>
<tr>
<td>Infosys</td>
<td>2.13</td>
<td>2.23</td>
<td>2.28</td>
<td>3.62</td>
<td>4.91</td>
</tr>
<tr>
<td>HCL</td>
<td>7.63</td>
<td>n.a.</td>
<td>4.68</td>
<td>2.60</td>
<td>3.38</td>
</tr>
<tr>
<td>Satyam</td>
<td>1.31</td>
<td>1.20</td>
<td>2.54</td>
<td>2.78</td>
<td>3.36</td>
</tr>
<tr>
<td>IBM India</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>1.22</td>
<td>2.20</td>
</tr>
<tr>
<td>Cognizant</td>
<td>n.a.</td>
<td>n.a.</td>
<td>0.75</td>
<td>1.70</td>
<td>1.87</td>
</tr>
<tr>
<td>NIIT</td>
<td>1.99</td>
<td>n.a.</td>
<td>3.37</td>
<td>3.07</td>
<td>1.81</td>
</tr>
<tr>
<td>Silverline</td>
<td>2.10</td>
<td>2.05</td>
<td>1.23</td>
<td>1.80</td>
<td>1.73</td>
</tr>
<tr>
<td>Pentasoft/Pentafour</td>
<td>2.26</td>
<td>2.69</td>
<td>2.72</td>
<td>3.27</td>
<td>3.22</td>
</tr>
<tr>
<td>CR 5</td>
<td>0.336</td>
<td>0.256</td>
<td>0.266</td>
<td>0.222</td>
<td>0.252</td>
</tr>
<tr>
<td>CR 10</td>
<td>0.449</td>
<td>0.342</td>
<td>0.373</td>
<td>0.316</td>
<td>0.345</td>
</tr>
</tbody>
</table>


[Notes to table-2.1

1. Market shares are firm sales as percentage of total industry sales revenue for that year.
2. Pentafour technologies was split into two firms: Pentasoft and Pentamedia. For compatibility the sales revenue of the two firms have been added up in the latter years.
3. The CR 5 and CR 10 ratios are computed as the proportion of the industry sales with the 5 and 10 largest (by sales) firms.]

Page | 17
India's rapid growth is supported by IT-BPO which is centered on development of the software industry. In this industry hardware-related business accounts for a mere 20 per cent of the whole, while the entire remainder represents the contribution of software and service-related businesses. India has grown to be a major global player in the software business. Figure 2.1 shows the changes in the market scale of the IT industry in India and its share of GDP. The entire market of the IT industry has achieved growth. Exports have achieved particularly remarkable growth and are estimated at US$31.9 billion in 2007, or almost 18 times more than in 1998 (US$1.8 billion). This amounts to about 60 per cent of world offshore IT-BPO (outsourcing to other countries). As a result, the IT industry is projected to account for 5.4 per cent of India's GDP in 2007. In particular, software development and services excluding hardware have grown by more than 30 per cent annually, of which about 80 per cent is exported, thereby becoming India's largest export industry.

Figure 2.1
Trends in Market Size of IT industry in India and its Share in GDP

[Source: Science and Technology Trends- Quarterly Review No.26, Jan. 2008]

The style of India's software business has changed over time, and can be classified largely into four phases (Table 2.2). Until around 1995, India was mainly a subcontractor for European and American companies and its attractiveness were based on low cost
(Phase I). However, around 2000, not only India's low cost, but also its high quality and productivity were recognized, and development businesses increased from simple subcontracting business (Phase II). Around 2005, in addition to cost, quality, and productivity, India was successful in winning the confidence of customers, which made it possible to receive orders for business that treats highly confidential information such as client data. Simultaneously, offshore software development performed locally in India has become the main stream, replacing the on-site business mode that required the subcontractor to visit the client (Phase III).

### Table-2.2

<table>
<thead>
<tr>
<th>Years</th>
<th>Phase</th>
<th>Business form</th>
<th>Business location</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985-1995</td>
<td>Phase I</td>
<td>Contracting out from western companies</td>
<td>On-site</td>
<td>Merit of low labor cost</td>
</tr>
<tr>
<td>1995-2000</td>
<td>Phase II</td>
<td>Change from contracting out to development business</td>
<td>On-site</td>
<td>Recognition of high quality and productivity</td>
</tr>
<tr>
<td>2000-2005</td>
<td>Phase III</td>
<td>Development of software with highly confidentiality</td>
<td>Off shore</td>
<td>Recognition of high security</td>
</tr>
<tr>
<td>2005-2005</td>
<td>Phase IV</td>
<td>Development of global scale systems</td>
<td>Off shore</td>
<td>Expectation of innovation in addition to cost, productivity, quality and security</td>
</tr>
</tbody>
</table>

[Source: Science and Technology Trends- Quarterly Review No.26, Jan. 2008]

This contributes to cutting the overhead costs associated with software development, but can also be regarded as proof that Indian companies have succeeded in gaining the confidence of clients. Simultaneously with this change in business forms, the relative importance of business for domestic consumption and foreign export has changed places, with exports now far exceeding domestic consumption (Figure 2.1). Since the year 2005, Indian companies have played an increasingly important role, as seen in the increase in orders for large global-scale system development projects such as integrating branch systems of multinational corporations scattered around the world (Phase IV).

Another very interesting feature which needs attention is that during the evolution of these four phases, there was a gradual shift of outsourcing from on-site (or body-shopping) to off-shore operation. A brief discussion of this shift of operations will be done later on in this chapter.
2.2 Different Phases of Growth of the Software Industry in India

On the basis of changes in policy-induced matters relating to a shift in the environment from regulation to de-regulation to liberalization and demand for software services as computerization spread across the western world, we may identify four different phases in growth of software services in India.

i. Pre-1984, when the major thrust of Government policy was achieving self-reliance in hardware capability and the major event of significance for fledgling software firms was the dramatic exit of IBM, in protest against the Foreign Exchange Regulation Act which required the dilution of foreign equity.

ii. 1985-91, when the crash in hardware prices worldwide and de-regulation of licensing policy in India coincided with an acceleration of demand for software programmers worldwide as firms moved from mainframe to client server systems.

iii. 1992-1999, which saw full financial liberalization by the Indian government, large scale entry by multinational firms and a peaking of worldwide demand for software

iv. 2000 onwards, which saw a crash in software demands and forced consolidation in the industry.

Foreign firms played an important role in all four phases, though their presence has been more marked in the last two periods. In our analysis we distinguish between two sorts of foreign firms: subsidiaries of multinational firms and the back end offices established by the US individuals of Indian origin usually exploiting expatriate links. The latter have been noted to be an important factor behind the rising share of foreign investment for developing economies like China and India. There are two reasons why we distinguish between these two kinds of firms. First multinational firms are more likely to have the kind of superior managerial and business abilities than the US back ends.
Table-2.3

Entry Dates and Types of Entrants to the Indian Software Industry

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Business House firms</td>
<td>7</td>
<td>6</td>
<td>15</td>
<td>54</td>
<td>12</td>
<td>95</td>
</tr>
<tr>
<td>Joint Venture</td>
<td>1</td>
<td>3</td>
<td>18</td>
<td>2</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>Multinational Enterprises</td>
<td>0</td>
<td>5</td>
<td>18</td>
<td>68</td>
<td>5</td>
<td>96</td>
</tr>
<tr>
<td>Entrepreneurial firms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>US-Indian Enterprises</td>
<td>1</td>
<td>1</td>
<td>10</td>
<td>31</td>
<td>3</td>
<td>46</td>
</tr>
<tr>
<td>Entrepreneurs with</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>prior professional experience</td>
<td>2</td>
<td>3</td>
<td>14</td>
<td>24</td>
<td>9</td>
<td>52</td>
</tr>
<tr>
<td>Entrepreneurs with</td>
<td>5</td>
<td>7</td>
<td>40</td>
<td>93</td>
<td>15</td>
<td>160</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>24</td>
<td>110</td>
<td>325</td>
<td>52</td>
<td>532</td>
</tr>
</tbody>
</table>


[Notes to table-2.3]

<table>
<thead>
<tr>
<th>Entrepren Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>If the origin of the firm could not be determined</td>
</tr>
<tr>
<td>Professional Entrepreneur</td>
<td>If a firm was started by professionals with prior experience in IT or IT management.</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>If a firm was started by an existing individual entrepreneur in fields other than IT</td>
</tr>
<tr>
<td>Multinational Enterprises</td>
<td>If a firm was started as a multinational subsidiary</td>
</tr>
<tr>
<td>US-Indian Enterprises</td>
<td>If a firm was started by people of Indian origin and incorporated in the US</td>
</tr>
<tr>
<td>Public Sector Enterprises</td>
<td>If a firm was started as a public sector unit/enterprise</td>
</tr>
<tr>
<td>Business House subsidiaries</td>
<td>If a firm was started as an arm of an existing business house</td>
</tr>
<tr>
<td>Joint Ventures</td>
<td>If a firm was started as a joint venture</td>
</tr>
</tbody>
</table>

[Source: Based on the description of NASSCOM (2001) register of firms]

Second, because the competitive pressures they exerted on domestic firms in the Indian software sector were different. Foreign subsidiaries established by expatriate Indians competed for both software projects and for software programmers along with domestic firms. Multinational subsidiaries were however, captive arms of the parent multinational and never competed with Indian firms for projects in the US or European markets. But they competed fiercely for software talent in the domestic labour market.

Both types of foreign firms were important to the growth of Indian software. This is clear from Tables 2.3 and 2.4. Table 2.3 depicts foreign entry over the four phases of Industry growth.
Table 2.4
Types of Firms and their Share in Revenues and Employment

<table>
<thead>
<tr>
<th>Type of entrant</th>
<th>% of sales revenue</th>
<th>% in total employment</th>
<th>Revenue per employee (Rs.10^6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business House firms</td>
<td>32.8</td>
<td>30.1</td>
<td>128.68</td>
</tr>
<tr>
<td>Joint Ventures</td>
<td>4.0</td>
<td>4.2</td>
<td>111.08</td>
</tr>
<tr>
<td>Multinational</td>
<td>25.6</td>
<td>16.8</td>
<td>180.25</td>
</tr>
<tr>
<td>Enterprises</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Sector</td>
<td>2.6</td>
<td>6.0</td>
<td>50.31</td>
</tr>
<tr>
<td>US-Indian Enterprises</td>
<td>6.4</td>
<td>8.1</td>
<td>93.53</td>
</tr>
<tr>
<td>Entrepreneurial firms</td>
<td>8.1</td>
<td>10.6</td>
<td>89.91</td>
</tr>
<tr>
<td>Professional</td>
<td>27.9</td>
<td>27.2</td>
<td>116.18</td>
</tr>
<tr>
<td>Not known</td>
<td>1.7</td>
<td>4.9</td>
<td>41.14</td>
</tr>
</tbody>
</table>


Our figures in these tables are based on the NASSCOM register (2001) of firms in the IT sector, and we added to the information provided in the register by classifying firms based upon their ownership. Table 2.4 displays the growth in the numbers of foreign firms along with their share in employment and revenues. Industry revenues are fairly evenly shared between foreign firms (including those owned by the US based expatriates) and entrepreneurial firms, followed by business house subsidiaries.

Table 2.4 also presents an interesting contrast in the revenue per man earned by the different categories of firms. Multinational firms show very high revenue per employee some of which may be due to the existence of transfer pricing/high salaries paid by MNC firms. Foreign firms established with the US link on the other hand show poor revenue per man figures, compared to the average.

Phase -I: Prior to 1984

The first software exporter was TCS (Tata Consultancy Services) which was founded in 1968 to serve the in-house data-processing requirements of the Tata Industrial Group. In 1969, it begun offering data-processing services to outside client on a Burrough's mainframe and became Burrough's exclusive India sales agent in 1970. In 1974,
Burrough's attracted by India's cost advantage, asked TCS to install its system at Burrough's client's office in the US. This commenced the export business termed as body-shopping i.e. the export of programmers for assignments on-site, typically lasting for a few months. They initially focused on system installation and maintenance. Later on they converted clients' existing application software into IBM compatible versions.

In the 1970s the Indian government tried to encourage exports by allowing those who developed software for export to do computer hardware imports. Export performance remained poor and Mr Menon, who headed the Department of Electronics in 1975-76, singled out the inability of Indian software to break into markets as the main factor constraining software exports. The tedious procedures governing foreign exchange and the inevitable delays in obtaining permissions for imports also prevented early software firms from moving rapidly in constantly changing markets.

The departure of IBM in 1977, in protest at the FERA rules, which required it to reduce its equity holding to 40 per cent, was the single most important event during this phase. IBM's departure created an import substituting opportunity for domestic manufacturers of computers. The exit of IBM also provided an opportunity for foreign companies such as Burroughs and ICL to push sales of their computers in India. Both types of companies depended upon programmers in India to write software conversion programs that could be used by clients (ex-IBM) to switch to their particular computer systems.

Domestic demand for software also came from the public sector's attempts to build nuclear and space capabilities, and demand for programming and maintenance from banks and other mainframe users in India increased. A few high profile public projects such as the computerization of Air India reservations, the computerization of the ASIAD games results and the computerization of the Indian railways provided valuable learning opportunities for the first domestic firms. Thus, software programming in India started early and despite a small domestic installed base of computers, Indian firms were exposed to a large variety of software platforms and a range of projects that varied in
their complexity. Thus a range of programming skills and knowledge of software languages was accumulated by Indian firms.

The dependence of software on hardware components during this period however, constrained potential entrants to the industry. Industrial policy did not help to overcome this problem. As India was still trying to build a domestic hardware industry through import substitution, duties on hardware components were high, and importers had to comply with a complex set of rules and regulations in applying to make imports of hardware and components. 1980-85 saw many policy attempts to make software development grow at the pace set by the growth of the indigenous hardware industry. Thus, the Software Policy of 1981 emphasized the generation and export of software using India's existing computing capacity, rather than on the basis of imported computers. The 1984 Computer Policy retained the export obligations and import tariffs that the industry was subject to. The only positive aspect was that since software was a service activity it was free from the restrictions of production licensing. This attracted to the sector entrepreneurs with access to private finance and some big business houses.

Indian firms faced other constraints as well. The basic infrastructure required for software production, viz. stable supply of electricity and good communications, was available only in some regions e.g. the Mumbai-Pune region, Bangalore and Delhi. In the early 1970s, there was also a large technology gap and though domestic firms clearly saw the strategic value of alliances with foreign firms as being a mutually beneficial way to upgrade their technological knowledge, only a few firms had access to foreign firms willing to enter such alliances.

Foreign revenues were a relatively small proportion of total revenues in the 1970s and in interviews it was estimated that only about a third of all revenues came from exports. The few software projects executed abroad by Indian companies in this early period often took the form of data conversion projects executed for the foreign firm on its premises – hence the term on-site projects. In the on-site model for software service delivery, the software exporting firm provided the personnel to execute the project while the client
firm provided the specifications and in many cases the capital equipment needed. Payments for labour in this model were made according to time use. The on-site model was popular for two main reasons. First, it was often easier to ‘hire in’ the services of an engineer rather than trying to do the work in India. In this way the software skills of Indian programmers could be ratcheted up to reap maximum benefit and neither the supplier nor the buyer had to bear the higher costs resulting from the protection for domestic hardware manufacture and import regulation. Second, in the on-site model the client was assured of constant monitoring – an important guarantee in a period when Indian exports had the reputation of being of poor quality. However, managers of firms also stressed the advanced nature of some of the work done in these early export projects, particularly as many of them involved simulating different operating systems on the mainframe computers the software company had.

Working within these infrastructure and policy constraints the single major achievement of the early Indian firms was that they developed the ability to put together a team of talented software programmers and earned a reputation for delivering highly bespoke (technical) projects to large foreign firms operating with a variety of software systems. This owed much to the strategic vision of one firm – the industry leader and pioneer Tata Consultancy Services.

**Phase- II: Stage of Experimentation and Entry of New Players**

The spread of computerization in the US and in Europe received a major boost with the advent of the personal computer and networked computers in the mid and late 1980s. The shift to networked computing in the late 1980s opened up a huge new source of demand for customized software that allowed firms to migrate from mainframe to networked systems and to the installation and maintenance of enterprise resource systems. The industry grew substantially after 1984, when the New Computer Policy was announced.
Table 2.5
Growth of Indian Software Industry

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Exports $m</th>
<th>No. of Firms</th>
<th>Av. Revenue Per firm ($)</th>
<th>Av. Revenue Per employee ($)</th>
<th>Share of Top 8 firms (per cent)</th>
<th>Av. Revenue Per firm excluding Top 8 firms ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>4.0</td>
<td>21</td>
<td>190476</td>
<td>16000</td>
<td>90.0</td>
<td>30769</td>
</tr>
<tr>
<td>1984</td>
<td>25.3</td>
<td>35</td>
<td>722857</td>
<td>18741</td>
<td>78.0</td>
<td>206148</td>
</tr>
<tr>
<td>1990</td>
<td>105.4</td>
<td>700</td>
<td>150571</td>
<td>16215</td>
<td>65.5</td>
<td>53309</td>
</tr>
<tr>
<td>2000</td>
<td>5287</td>
<td>816</td>
<td>6479167</td>
<td>32635</td>
<td>38.3</td>
<td>4734406</td>
</tr>
<tr>
<td>2003</td>
<td>8600</td>
<td>3031</td>
<td>2837347</td>
<td>33076</td>
<td>64.8</td>
<td>1711214</td>
</tr>
</tbody>
</table>

[Sources: NASSCOM (2004), The IT Industry in India, New Delhi, NASSCOM; Richard Heeks (1996): Indian Software Industry, New Delhi, Sage.]

The number of firms rose from 35 to 700 by 1990 (table-2.5). This was enabled by three factors:

(i) First, the Govt., after a period of hostility to private IT sector, turned around and announced the New Computer Policy (1984) and also the Software Policy (1986). This substantially reduced import tariffs (on hardware from 135 to 60 per cent and on software from 100 to 60 per cent); re-allowed wholly owned foreign firms for exports and exempted all export income from tax in 1985.

(ii) Second, the workstation with its sophisticated graphics and numerical computational capabilities was introduced in the mid 1980s. The workstation, unlike the earlier PC, had the capacity for stand-alone programming for the mainframe and could run small business applications.

(iii) Third, was the widespread adoption of ‘Unix’ as a standard operation system for workstation and mainframes from mid 1980s [commonly referred to as U-W standard].

The U-W standard enabled programmers to develop programmes on any workstation in a common language (C), whereas earlier programmers needed to work on specific mainframes and write programmes in the language of that mainframe supplier. Hence, the reduced tariffs and the U-W standard have helped programmers in India to write programmes economically.
Fortunately the ‘freeing’ of software policy occurred at a time when India still enjoyed a huge cost advantage in the form of low software salaries. Foreign firms quickly realized the cost advantages of employing Indian programmers to write software programs. Thus, Texas Instruments and COSL established operations in India, despite the considerable restrictions on foreign investment that were still in operation in this period. The US multinationals in particular balanced infrastructure constraints with the benefits of the time difference between India and the US. The twelve-hour lead enjoyed by Indian firms allowed them to utilize hardware facilities lying idle in the US. The time difference effectively extended the US working day for the client firm. The expenditure on a dedicated satellite link was more than compensated for by the cost advantage of software salaries in India.

Indian software firms, many of whom were already involved in the maintenance of mainframe systems, slowly tapped into the emerging global demand often based on their good reputation with previous clients. The tasks involved in writing migration software were sufficiently routine work to be outsourced, but they required knowledge of diverse software languages and protocols that Western firms wanting to computerize their operations would have found expensive to acquire. The domestic market too saw some change. The advent of microcomputers and personal computers coupled with the fall in hardware prices facilitated the spread of computing to small users in the domestic market. The installed base of computers between 1983 and 1987 in India is estimated to have grown from 3,500 systems to 26,560 systems.

Lower hardware costs encouraged entrepreneurial entry into the sector. New entrants also investigated diverse product spaces. The first product firms (such as Sonata and Mastek) appeared with product offerings for the domestic market. Mastek was also the first to experiment with a product model based on the use of software tools. Infosys and Wipro also developed products in this period and NIIT (National Institute of Information Technology), an educational training company, grew substantially.
On the whole the software product model was a failure. The technological capability needed to write a software product was simply not enough. The domestic market for products was not deep enough and the foreign market was hard to penetrate. The lack of access to risk capital to absorb early investments, and the lack of marketing ability are often cited by firms as major reasons why they failed in the product segment.

Many of the constraints faced by software product firms were bypassed in the outsourced service model. Here the structure of costs was mostly variable and service projects paid for their costs as they neared completion. Reputation and investments in quality substituted for large marketing outlays. Interaction with demanding foreign customers encouraged and informed firms about what investment was needed in quality and process control. The per unit profits on service exports were far more stable than those on domestic products or services, and services firms saw steady growth.

As a consequence of this entrepreneurial experimentation with product and service models, the on-site services model emerged as the dominant business model by the end of the 1980s. TCS pioneered the first complete custom software project for an overseas client and thus it gave birth to a new way of working. This “Remote Project Management Model” encouraged a large number of new firms to enter the market. The basic value proposition and capability that prevailed was the ability to deliver a working team of software professionals capable of undertaking any software engineering job, to any part of the world. NASSCOM estimates suggest that in 1988 nearly 90 per cent of software revenues came from on-site work. Even firms that had started in products, such as Sonata and Mastek, changed to the on-site services model by the mid-1990s.


In the 1990s, India went through a series of economic reforms. Apart from tariff reductions, a key reform was that firms were allowed to spend their export dollars on opening office overseas, thus giving them access to more firms. The year 1991 saw many policy-induced changes in the Indian economy, including sharp depreciation of the rupee
and the liberalization of financial flows. The depreciation of the rupee kept wage costs in dollar terms down in the domestic economy, even as software salaries were on the rise.

The software industry also saw an important policy innovation in the form of the Software Technology Parks of India (STPI) scheme. Designed to overcome infrastructural constraints imposed by poor access to telecommunications, exporters could register with their regional STP for satellite links, and operate via the web, for a fraction of what it would have cost them to have their own dedicated lines. This dramatically decreased the cost of telecommunication access and increased its coverage so that offshore operations came within the reach even of smaller firms. Desai (2003) argues that many firms switched to web-based export delivery made possible by the STPI scheme.

The experience of Citibank and Texas Instruments had demonstrated that an Indian subsidiary of a multi-national corporation (MNC) could operate as a low-cost outsourcing centre for its global software needs. Through the 1990s, when foreign investment norms were liberalised, a steady stream of multinational subsidiaries entered the market, often manned by Indian software professionals and management. Software was usually developed in the Indian subsidiary and teams of Indian software professionals travelled to the different countries to install it. While domestic firms such as TCS and later Infosys had already demonstrated the profitability of the on-site model with some off-shore elements, the operations of MNC subsidiaries identified the major elements of a successful off-shore model: investment in telecommunication links, and good process management.

Domestic firms were quick to seize the opportunity to reap greater profit offered by the offshore model and they contracted with foreign firms to provide software services written at their own centres located in India, usually for a fixed price. These Offshore Development Centres (ODCs) were usually dedicated to serving one firm, and large firms like Wipro and TCS established dedicated offshore development centres for each of a number of large multinational clients. The benefits to the foreign firm in operating with
an Indian ODC lay in the lower fixed costs they had to maintain—it was definitely cheaper in areas defined as non-strategic than setting up their own subsidiary. ODCs only had total autonomy for small, specific and non-critical tasks. Some Indian firms sought to reduce the risk involved in dependence on a single customer by signing up with several multinationals. This possibly provided economies of scope, and the development of some generic project management skills.

The competitive pressure exerted by this new entry however, forced the market leaders to adopt differentiation strategies. One such strategy was to acquire quality certification, such as that proposed by the SEI-CMM [CMM (Capability Maturity Model) is a structured process for software development associated with the Software Engineering Institute at Carnegie Mellon University. It consists of five ‘maturity’ levels. Companies or units assessed at levels 4 and 5 are capable of controlling, managing and improving software development practices]. This signaled the commitment to provide reliable and error-proof services and a willingness to be scrutinized. By the end of 1998, more than half of the SEI-CMM 4 and 5 rankings were awarded to Indian software firms. Another differentiation strategy was to acquire domain expertise, often through collaborations and the careful choice of partners within the so-called development centres. Although the actual distribution of contracts does not show this, the intentions of the leading companies, presented in company annual reports and declarations to shareholders, suggests that there was selectivity in the choice of domains: TCS and Infosys concentrated on the domains of finance and insurance, Pentafour concentrated on creating digital assets in animation, Satyam sought to concentrate on software for automated systems in transport manufacturing, and Wipro focused on telecommunications and research and development (R&D) services.

By the end of this period, the Indian software industry had built up both a general capability (for outsourced service delivery) and various firm-specific capabilities (particularly in software process management). Firms with better-developed process management ability were able to improve their productivity. Though experimentation with business models continued into the late nineties, it was different from the previous
period in that it was more path-dependent. Domestic firms concentrated on developing more profitable variants of the outsourced service model that had emerged as being the most cost-effective in the early 1990s, applying it to different domains and to R&D services, moving up from on-site to off-shore project execution, and moving from time and materials costing to fixed price contracts.

**Phase-IV: Consolidation and slowdown: 2000 onwards**

The slowdown in demand swiftly followed the dot.com crash and the recession in the US. In anticipation of this event, attempts had been made to tap into other markets such as the European, Japanese and African markets. On the policy front, the long-awaited bill allowing private investment in telecommunications was passed. As a consequence the costs of connecting to the Internet fell sharply for all software producers.

Two main developments have marked the period since 2000: the growing size of outsourcing deals secured by the largest domestic software firms and the growing offshore component of revenues. It has been reported that top Indian companies were routinely winning multi-year off-shore contracts valued at about $75 million or 300 man-hours, values much higher than the $10-15 million contracts of the late 1990s which also were shared between many more firms.

Leading software firms seem to see business process outsourcing work as part of their strategy towards adding value based on the goal of becoming end-to-end consultants. Other firms have concentrated on expanding their more profitable offshore operations. NASSCOM estimates that the share of offshore revenues in software services grew dramatically from 38 per cent in 1999-2000 to 57 per cent in 2002-03. Other domains where the offshore model could be applied have been explored. These include the provision of e-services, web hosting, data transcription, e-CRM etc. These new areas have received an unexpected impetus from the recession, which has heightened foreign firms' sensitivity to cost pressures. Lastly, with the improvement in access to venture capital and corporate venture funds, a third strategy for value addition is being explored.
in new niche markets in technologically new areas such as DSP (digital signal processing) software, embedded software and system on chip (SOC). Firms in these areas are increasingly turning to a product-based model incorporating some kind of IPR protection.

Changes in the external environment came from two directions. First, there were policy-induced changes as the Indian economy moved from regulation, to de-regulation and liberalization, as shown in table-2.6 below.

Table-2.6
Policy Changes Affecting the Software Sector (1972-1999)

<table>
<thead>
<tr>
<th>Year and policy</th>
<th>What the policy did</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software Export Scheme, 1972</td>
<td>Permitted the imports of hardware for purposes of hardware development on condition that the price of hardware was recouped within 5 years through foreign exchange earnings.</td>
</tr>
<tr>
<td>Liberalisation of policies related to software industry, 1976</td>
<td>Hardware import duties reduced from 100% to 40%. Faster clearance of software export applications. Software could take advantage of export incentives including location in Export Processing Zones. Non-resident Indians were allowed to import software for purposes of export. Export obligation was 100% of all output produced.</td>
</tr>
<tr>
<td>Software Export Policy, 1981</td>
<td>Import duties on hardware raised to encourage use of indigenous computers. Firms allowed to import hardware to write software for both domestic and export purposes. Software exporters could also import 'loaned' computers.</td>
</tr>
<tr>
<td>New Computer Policy, 1984</td>
<td>Import duties on hardware reduced from 100% to 60% for software developers. Access to foreign exchange was made easier for software firms. Income tax exemption on net export earnings halved from 100% to 50%. Software exports were sought to be promoted through satellite based communication links with overseas computers, and the national computer network Indonet was made available for exports from public sector and small firms.</td>
</tr>
<tr>
<td>Software Policy, 1986</td>
<td>Software growth for the first time regarded as independent of hardware growth in the domestic economy. Imports of hardware liberalised and duties on them abolished for exporters of software. Export obligations for hardware importers increased: export obligations ranged from 250%-150% of foreign exchange used, to be repaid to the government in 4 (rather than 5) years. A penalty was payable for non-fulfilment of the export obligation. Imported software attracted a 60% duty on its value. Special export obligations governed the use of dedicated satellite links.</td>
</tr>
</tbody>
</table>
Established under the Department of Electronics of the Government of India, the STPs were autonomous bodies to encourage and support small software exporters, by giving 100% export-oriented firms a tax-free status for 5 years within the first 8 years of operation. In addition, they were provided with office space and computer equipment, access to high-speed satellite links and an uninterrupted supply of electricity. STPs also provided services such as import certification, software valuation, project approvals, market analysis, marketing support and training and 'single window clearance' for projects. STPs connected by an integrated network, so subscribers can lease a point-to-point digital channel, and have access to the Internet with their own TCP/IP number, providing e-mail, remote log in, file-transfer services and access to the WWW.

Export obligations applied to firms in the STPs using telecom infrastructure.

**New Economic Policy, 1991**
- Devaluation and partial convertibility of the rupee.
- Abolition of foreign exchange for travel tax.
- Reduction in telecommunication charges for satellite links.
- Export obligations on STPs removed.
- Reduction of hardware import duties.

**Import duties on imported software, 1992-95**
- Reduced to 20% on applications software and 65% on systems software in 1994.
- Reduced to 10% on both in 1995.

**Income-tax exemptions, 1993-99**
- Software exports were exempt from income tax and this tax-free status was confirmed every year till 1995 after which it became open-ended. There is talk of ending this status in 2001.

Second, there were changes in the world demand for software services as computerization spread across the Western world. The various changes in the government policy have definitely played an important role in the development of the software industry. Table 2.6 provides a brief illustration of the various policies that were implemented during the period 1972 to 1999 and their impact on the development of the software industry.

It was in 1970s that computer as a productivity tool started proliferating in the Indian industrial scene. But it was only by mid-1980s that the forecasters, analysts and Indian policy planners began to understand the potential of Indian talent in computer software.
This realization led to the formulation of first computer policy (related to software) in 1986. Since then IT has been given much thrust and software export has been growing at a phenomenal rate. Of late, the information Technology Action Plan suggested by IT task force, 1998, such as setting up of a world class info infrastructure with an extensive spread of fiber optic networks, zero customs, and zero excise duty and procedural simplification etc. have provided much needed fillip to the industry.

2.3 Factors Responsible for the Success of the Indian Software and Services Industry

The phenomenal growth of Indian software export can be attributed to the growing respect for Indian software industry in the international market, continued rise in the offshore services, quality services, timely delivery, entry into new markets, Y2K data conversion business, international linkages and also due to various steps taken by the Government to promote software export such as simplifying procedures, tax concessions, establishments of software technology parks, more liberal foreign investment policies, as well as a number of comparative advantages India possess such as 2nd largest pool of scientific and skilled manpower which is also English speaking, low cost of labour, investment friendly economic climate and policy, locational time difference with the western world enabling round the clock development, building up of national level institutions and continued expansion of their capacity, pro-active role by NASSCOM (the software industry association), market diversification and so forth. Some of these factors are elaborated below:

(i) India’s Achievement regarding Conversion of Y2K Data
In the late 1990s, it was realized that computer system would fail at the end of 1999 when calendar changed to year 2000 because years were designated with a code comprising only two last digits of the year. This peculiar problem gave rise to a temporary rise in software conversion work. Y2K solution was a golden opportunity for Indian software exporters. Indian firms were well placed to take advantage of the situation because:
a) Indian programmers were already familiar with the obsolete code that had been used many years before
b) Y2K conversion was labour intensive and at the low end of the software development, Indian software professionals were low cost for foreign clients.
c) Moreover, linkages from western clients to Indian software firms had already been established via body shopping, and rising offshore services in 1990s via international telecom linkages.

One may wonder if Indian software firms alone could do the Y2K conversion. Of course, software firms in other countries surely could do also the Y2K conversion work, but they did not have the combination of first mover advantage and the low labour cost that Indian firms possessed.

(ii) Shift of Operation: On-site to Offshore

During the initial phase Indian software export was dominated by onsite development than offshore development. But the trend has been reversing and the dominance of offshore software has been increasing over a period of time. For instance, the percentage share of offshore services which was a mere 5 per cent in 1991-92 increased to 42 per cent of total export in 1999-00 and further to 70 per cent in 2005-06. On the contrary, the age share of onsite services declined from 95 per cent in 1991-92 to 58 per cent in 1999-00 and further to 30 per cent in 2005-06 (figure 2.2).

Figure-2.2
Changing Share of Onsite and Offshore Services

[Source: NASSCOM Data and “Performances, Challenges and Opportunities of Indian Software Exports” by A.Illiyan (JATIT)]
This shift has been possible because of setting up of a number of Software Technology Parks, which inter alia provided access to modern telecommunication facilities, and liberalized policies towards telecom sector which has led not only to the entry of private sector in telecom companies but also low telecom tariff and high speed data communication links to the industry. With proliferation technology and software technology parks, services of high speed dotcom provided by VSNL (Videsh Sanchar Nigam Limited), Reliance, Airtel etc., liberalized economic policy, unnatural visa restriction in USA and some other Western European countries, the component of offshore software development is expected to increase further.

(iii) International Recognition and Certification for Quality

Indian software organizations adopted the ISO model soon after it came and then when the Capability Maturity Model (CMM) started becoming more important, rapidly transitioned to the CMM. This has given the Indian companies solid project and process management strength these models are supposed to bring.

<table>
<thead>
<tr>
<th>Description</th>
<th>No. of Firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO 9001</td>
<td>330</td>
</tr>
<tr>
<td>ISO 9002</td>
<td>23</td>
</tr>
<tr>
<td>ISO9001/9002</td>
<td>345</td>
</tr>
<tr>
<td>ISO9001:2000</td>
<td>72</td>
</tr>
<tr>
<td>SEI CMM Level 5</td>
<td>82</td>
</tr>
<tr>
<td>SEI CMM Level 2,3,4</td>
<td>41</td>
</tr>
<tr>
<td>CMMI Level 5</td>
<td>32</td>
</tr>
<tr>
<td>CMMI Level 2,3,4</td>
<td>14</td>
</tr>
<tr>
<td>PCMM Level 5</td>
<td>13</td>
</tr>
<tr>
<td>PCMM Level 2,3,4</td>
<td>11</td>
</tr>
<tr>
<td>Six Sigma</td>
<td>44</td>
</tr>
<tr>
<td>Others</td>
<td>41</td>
</tr>
<tr>
<td>Total</td>
<td>401</td>
</tr>
</tbody>
</table>

[Source: Joseph (2007)]
[Note: Total refers to the total number of firms for which information is available]
The following statistics help us empirically prove our argument. In 2005-06 among the 401 firms that reported different international quality standards 82 had SEI CMM level 5, the highest level of quality accreditation across the globe, which that accounted for more than two-thirds of such firms in the world over. As many as 123 firms had SEI CMM level 2 certification or above and 330 had ISO 9001 (table 2.7). If the evidence presented in table is any indication most of the Indian software enterprises have strived to attain excellence in their professionalism and best practices. (Joseph 2007).

(iv) Availability of Large Pool of Skilled Manpower

India can boast of the world's 2nd largest pool of scientific and skilled manpower which is also English speaking and computer savvy. This large pool of cost effective and technically competent professionals offers the state of the art quality software which is regarded as India’s major advantage. Above all India has been well positioned to reap the demographic dividends as it has more younger generation (working population i.e. those in the age group of 15-59 years) than dependent population i.e. below 14 years and 60 plus (table-2.8 for details).

<table>
<thead>
<tr>
<th>Population</th>
<th>2001</th>
<th>2006</th>
<th>2016 (Expected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (million)</td>
<td>1027</td>
<td>1114</td>
<td>1268</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 -14 years</td>
<td>35.6%</td>
<td>32.5%</td>
<td>27.1%</td>
</tr>
<tr>
<td>15 - 59 years</td>
<td>58.2%</td>
<td>60.4%</td>
<td>64%</td>
</tr>
<tr>
<td>60 +</td>
<td>6.2%</td>
<td>7.1%</td>
<td>8.9%</td>
</tr>
</tbody>
</table>

[Source: Planning Commission, Government of India (GoI) – (www.planningcommission.nic.in)]

The IT action plan part III of National IT policy by Government of India has reiterated that special attention should be given for increasing the language advantage in exports by promoting sections of IT manpower to cultivate other languages like Russian, Japanese, Chinese, and European languages.
(v) **Low wage cost of labour**
Heeks (1996) had argued that single most important factor that led to the emergence of internationally competitive software and service sector in India is the availability of skilled manpower at highly competitive rates. Controlling for quality, Indian software is relatively low cost. This has been discussed in detail in Chapter 4 of this thesis. This cost advantage has not only enabled Indian companies to export manpower in a big way supplying contract programmers to Western Companies for routine programming, maintenance and data entry, jobs at cheap rates but also helped to attract more foreign companies to India in the software field.

(vi) **Locational Time Difference with Western World**
Locational time difference with the western world enabling round the clock development (24/7) is another added comparative advantage of India. To elaborate, there is 12 hour difference between the local times of India and the US Pacific Standard Time (PST). By the end of the day the doctors in the US send the problems to Medical Transcriptors in India who receive it while it is morning here. They work on it throughout the day and by the evening send the solutions back to the US. The doctors receive them back in the US at morning the next day. Thus, their tie-up with India helps round the clock functioning of the US industry (company). Similarly India is 5.0 to 5.5 hours ahead of the U.K. and 9.5 to 10.5 hours ahead of New York and Eastern Standard Time (EST).

(vii) **Policy of the Government and Investment Friendly Climate**
Emergence of IT on national agenda and announcement of National IT policy and enthusiastic announcement of IT policies by state Governments has further strengthened India’s position in the software driven IT sector in the world. The first computer policy (related to software) was announced in 1986 (table-2.6 provides the detail) and since then IT has been given ample thrust. Since 1991 a plethora of measures have been implemented such as income tax exemption to the export earnings of software industry, measures to make available faster and cheaper data communication facilities, removal of entry barriers for foreign companies and provision to finance software development.
through equity and venture capital etc. that gave fillip to software export. Besides this, a number of other incentives are provided by the Government.

One of the notable institutional interventions has been establishment of software technology parks (STPs) to provide the necessary infrastructure for software export. The first ones to come into being were those at Pune, Bangalore, and Bhubaneswar in August, October, and December in 1990 respectively. In 1991, four more STPs were set up by the DoE at Noida, Gandhinagar, Thiruvananthapuram, and Hyderabad. As of now there are 18 software technology parks in the country and they play a significant role in the software export. STPs are performing well in terms of its contribution to the overall revenue and export of the Indian software industry. ‘As on 31st March 2007, 7543 units were operative out of which 6321 units were actually exporting.

2.4 Changes in the Definition and Interpretation of Outsourcing and its Various Forms

In the early 1980s outsourcing referred to purchase of production materials or ingredients from outside the firm rather than producing indigenously from within the firm ["The Muddles over outsourcing"; Bhagwati, Panagariya, Srinivasan (2004)]. But the end of 1990s outsourcing referred mainly to the act of services of an external firm or what Prof. Bhagwati called ‘long distance purchases of services abroad’. In a corporate environment this outsourcing is better known as Business Process Outsourcing (BPO). A ‘BPO’ offers affirm to concentrate on its area of core competency, leaving non-core task to separate third party organization who can perform typically the peripheral functions (Such as accounting, pay-roll system etc.) in a more specialized manner and at a lower cost.

Under the WTO, the trade in services is specified in the name of General Agreement of Trade in Services (GATS), where there are principally four modes of supply of services defined on the basis of supplier of services and its user and also the specification of territorial presence.
• **MODE - I: Cross border supply of services** (e-learning offered through the uses of internet)

• **MODE- II : Consumption of Services Abroad** (movement of consumers or service recipient - travel and tourism of the foreign residents)

• **MODE- III : Commercial Presence of Service Provider Abroad** (service provider moves to the location of the service recipient - Banking and Insurance companies setting up their branches / affiliates in some foreign destinations)

• **MODE - IV: Presence of Natural Persons Abroad** (supply of services by a service provider - construction workers, medical or education services involving doctors or teachers migrating from one location to other).

Of these above four models of services, specified under the GATS rules, mode I is basically the present form of outsourcing of services of what we observe in the real world today.

Over the years the term outsourcing has undergone some changes in its interpretation and at the same time some key words have developed which need to be addressed.

(i) **Outsourcing:**

In recent times outsourcing refers to delegation of a company's operation, either partial or substantial to a to a third party vendor or to a external service provider who may or may not reside in the same country. These services are provided either onsite (body-shopping) or off-shore depending on the cost and availability of suitable infrastructure. If this activity affects the business process as a whole we call it Business Process Outsourcing (BPO).

(ii) **Off-shoring:**

The process of shifting some of the non-core activities / jobs to a foreign vendor or to a third party residing in some other country it is known as offshore outsourcing or off-shoring. Over the last few years this trend of re-allocation non-core business functions offshore to developing nations like India, China, Philippines etc has continued...
to gain momentum. This is also sometimes referred to as ‘Global Sourcing’, which is less focused on raw-materials and goods and more prominent in services and knowledge.

(iii) Near-shoring (Near-shore Outsourcing):

Whereas offshore relates to business processes or functions from one continent to another i.e. offshore deployment is generally inter-continental but near-shoring refers to intra-continental relocation of jobs (say from USA to Canada or Mexico).

Again some experts believe that it may not always be perfect for a company to choose only one best offshore destination. They rather suggested a good mixture of offshore, nearshore, and on-site destinations. Cap Gemini Ernst & Young (2004) recommended the idea of developing ‘Right-Shoring’ in the process of locating a correct vendor.

At present the term ‘outsourcing’ (especially offshore outsourcing) covers a wide range of activities. It can be broadly classified into six categories –

(a) Information Technology Outsourcing (ITO):

Large enterprises make their best effort to adopt the most sophisticated technology and for that they require system analysis, software packages, designing and updation of those operations. So choosing the appropriate technology partner is an essential part of business. The major technology services which are outsourced are software development services, e-commerce application, application development and management, telecommunication, e-solutions, website hosting, designing, maintenance and promotion.

(b) Business Process Outsourcing (BPO):

BPO conceptually allows an enterprise to concentrate or emphasize more on its area of strategic importance and core competency and leave support-based peripheral operations (which consume a substantial amount of time and resource) to a third-party service provider. These services include enterprise management, customer relationship
management, payroll, accounting, inventory, human resources etc. Recently the other areas which are opened to this activity are health care, consultancy, insurance, infrastructure, media, and entertainment etc.

(e) **Engineering Services Outsourcing (ESO):**
Globalization of engineering services has opened up a new frontier for outsourcing for countries like India. A country, which can build up its capacities and capabilities, infrastructure, and international reputation, can be a preferred destination of these kinds of high value services.

(d) **Legal Process Outsourcing (LPO):**
Legal Process Outsourcing (LPO) is one of the value added BPO services which involves legal work that companies outsource to more economical offshore destinations. Legal outsourcing has gained tremendous ground in the past few years in the US. LPO firms, primarily from India, have had success by providing services such as document review, legal research and writing, drafting of pleadings and briefs and providing patent services.

(e) **Public Sector Outsourcing (PSO)**
The transfer of service provision from the public to an external organization (which is typically in the private sector but may also be an in-house team) is defined here as public sector outsourcing. For reasons of probity and accountability, this transfer is usually done by way of a competitive tender. Importantly, outsourcing enables the government to retain control over the specification of the service, the management of the contract, and the evaluation of the service provider's performance. Even if the government decides to maintain public ownership of essential assets, the government could transfer responsibility for managing the asset to the private sector, thereby separating asset ownership from service provision.
(f) Knowledge Process Outsourcing (KPO):
Of late the phenomenon which has attracted the off-shoring vendors is KPO. KPO is a high end task as compared to BPO (which is a low end task). Here, the service provider, instead of providing a process enterprise creates a domain enterprise. These services include investment and valuation research, market research, patent filing, insurance claim, etc. Evalueserve predicts that countries like India have a great potentiality in KPO in the future due to its knowledge base.

2.5 Transition from Material Outsourcing to Services Outsourcing

The history of outsourcing can be traced back several centuries ago in the theories of 'competitive advantage' developed by Adam Smith in his book "The Wealth of Nations" published in 1776. Companies or organization in the 1800 and early 1900s were such that companies were vertically integrated, taking care of all their activities themselves (from manufacturing to retail stage) and some companies depended on external organizational assistance to complete their entire business process ('On-shore Outsourcing'). Initially this outsourcing took place in low technologically sophisticated items like toys, shoes etc. Later on this was shifted to some higher value, high-technology components.

The Initial Wave - Outsourcing in Manufacturing:

It has been pointed out by A.D. Bardhan and Cynthia A.Kroll that the first impulses of outsourcing in the US was in manufacturing operation and it was found that during the ten year period (1987-1997). The share of imported ingredients in the US production structure increased from 10.5per cent to 16.2per cent and in high-tech manufacturing, such as computers and electronics, from 26 to 38per cent (figure-2.3).

These data continue a long history of foreign outsourcing in the US manufacturing and the associated loss of blue-collar jobs in many industrial sectors. Indeed, one of the attributes of the modern stage of globalization for advanced industrialized countries is the...
offshore production of intermediate inputs, usually in low-cost developing countries. This shows that entire manufacturing process is not completed within one nation.

Figure-2.3
Imported Inputs as a share of Total Inputs in Total Manufacturing and High-Tech Sectors

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Manufacturing</th>
<th>High-Tech Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>5%</td>
<td>15%</td>
</tr>
<tr>
<td>1992</td>
<td>10%</td>
<td>25%</td>
</tr>
<tr>
<td>1997</td>
<td>15%</td>
<td>35%</td>
</tr>
</tbody>
</table>


Instead, activities are outsourced to countries of East Asia (like China, Malaysia, South Korea, Taiwan etc) to take the benefits of low-priced skilled labour, business-friendly environment and a network of supply. But some activities like R&D, marketing and finance, and other better paying jobs in management are preserved in the home nation.

The Current Wave of Outsourcing of Services

From 1990 onwards Business Services Outsourcing (BSO) or Business Process Outsourcing (BPO) acquired the highest prominence. The rapid development of IT, telecommunication, internet facilities and liberalization of markets in many developing economies created the burst of outsourcing in services, particularly in non-manufacturing sectors like telecommunication, retail trade and finance (including banking and insurance). The software sector was the first service sector to transfer significant activity to foreign locations, leading to the creation of a critical mass of expertise and resources in concentrated locales, such as the city of Bangalore in India.
During the 1970s the US computer companies outsourced their pay-roll system to some external service provider. In 1980s this was extended to pay-roll, billing, word-processing. Very recently the trends in outsourcing is such that it has been extensively used in customer interaction, management and back-office operations, insurance claim processing, medical transcription, legal data base, on-line education, website services and so on. Another most widely practiced operation has been the work performed by Call Centres.

One important point to be noted is that though the push factors are more or less identical for those of manufacturing and services and are largely cost driven, but regarding pull factors there exist differences across countries providing and offering outsourced services. Other than the cost advantages provided by firms in East Asia (like Malaysia, The Philippines, India etc.) there are other factors resulting in concentration of these jobs in this part of the world. They are wide spread acceptance of English language as a medium of communication; common kinds of legal and accounting systems; general institutional compatibility and accountability and geographical locations of time differential providing a quick turnaround overnight and also a steady supply of technically skilled graduates.

Figure 2.4 demonstrates that among the various competitive destinations of the world India is the most preferred location for offshore outsourcing. Keeping in view factors like infrastructural facilities, country risk, FDI incentive, political environment and time zone preference and the capabilities of the workers India is in a more advantageous position than other nations. Among the various destinations, India is presently one of the most preferred destinations for BPO and ITES (Information Technology Enabled Services). But it has been found that firms in various countries are rapidly gaining momentum in the fields of software services outsourcing and BPO activities- such as back up office and call-centre operations in Malaysia and Philippines; embedded software, application software and financial operations in China; high-end customized software in Russia and Israel; package software and product development in Ireland.
2.6 Growth of Outsourcing and Its Various Phases

Until mid 1990s Indian companies’ officials were hired to do repetitive nature of monotonous jobs which were disliked by many IT professionals, since the salaries offered were also very low. But during the late 1990s the fear of Y2K problem created huge demand for technically sound IT professionals which boosted the demand for IT services in India. This coincided with the ‘Euphoric Internet Bubble’ which led many good-quality IT professionals to join high-end technology start-up companies. So in order to tackle the Y2K problem and the internet boom there was a sharp rise in the demand for IT professionals in the US. In this situation many companies started to send their back-office tasks, software development and maintenance, pay-roll, record-keeping activities, to firms in low cost nations like India, Mexico, and China.
The growth of BPO in India can be classified into four distinct phases:

**The First Wave: Company Owned Units Pioneered BPO in India**
Company owned units such as American Express, General Electric (GE), Citibank, and AOL etc. triggered the trend of outsourcing back office operations and call centre services to India. Since then several banks, insurance companies, airlines and manufacturing companies have set up back office service centers in India.

**The Second Wave: Venture Funded New Companies**
Over the last few years, a number of experienced professionals have set up start-up operations in India. Generally such start-ups have been funded by venture capital funds.

**The Third Wave: Leading IT Services Companies enter BPO**
Given the magnitude of such opportunity, natural synergies with the software services business and the ability to leverage their high-end physical infrastructure and management band width, most large IT services companies have ventured into ITES. In this phase there has been consolidation of the market with the smaller players merging with each other/ larger companies for economies of scale.

**The Fourth Wave: Domain / Industry Specialized BPO’s**
Niche players in industry verticals or specific business processes have setup BPO businesses. Many of these players have had vast experience in the domestic market and are now offering offshore BPO services. Generalized large BPO players are now focusing on “verticalizing” their competencies and structures.

A majority of the key players in the BPO industry in India are captive units of MNCs and international BPC companies desiring to take advantage of the cost arbitrage offered by India. For the Indian ventures of these MNC’s the risks are limited since they are captive units and volumes are assured. Many of the BPO ventures of MNCs are now trying to offer their services to other companies. Several ventures have been hived off into independent companies to attract other customers and become profit centres as opposed
to the cost centres they used to be earlier. Examples include eServe International, World Network Services (British Airways) and GECIS.

**Process Methodology for Managing IT Outsourcing**

Phase 1: Determining a sourcing strategy

Phase 2: Analysis of sourcing needs and the operational relationship

Phase 3: Vendor selection and contract negotiation

Phase 4: Transition to the service provider

Phase 5: Managing the performance of the service provider

Deutsche Bank Research (2004) specified four levels of outsourcing, in general. They are:

**Level-I:** Out-tasking / Selective outsourcing
[Partly outsourcing of business operations]

**Level-II:** Business Process outsourcing (BPO)
[Outsourcing of standardized functions- Accounting, IT-support system]

**Level-III:** Comprehensive Outsourcing
[Outsourcing of complete IT operation, infrastructure and development]

**Level-IV:** Business Transformation Outsourcing
[Outsourcing of complete IT operation, new product development and innovation]
2.7 Reasons for Successful Offshoring in India

While scrutinizing the development process of outsourcing services in various nations, it is worthwhile to examine some important pre-conditions which led to the phenomenal growth of off-shoring models in India in particular.

(a) Liberalization of trade and globalization - Deregulation of financial markets, removal of trade restrictions and rapid flow of international capital in a market oriented global economy has resulted in the proliferation of the growth of MNCs/TNCs, seeking to move their operation off-shore, outside the home country’s jurisdiction in order to boost profit.

(b) Advancement in Communication Technology- decline in transaction cost globally
The roots of offshore outsourcing can be traced to Ronald Coase. Transaction cost theory helps managers think about whether to buy, build, or partner. The digitization and computerization of many business services, development of software and hardware packages, international bandwidth connection at affordable prices and falling international telecommunication cost have all greatly contributed to the acceleration of off-shoring services.

Over the last ten years there has been a steady decline in costs of personal computers (PCs), laptops and computer parts which has also reduced the cost of transactions. Recently fiber-optical cables have revolutionized the world communication through better quality of services and greater speed of transfer of data. The emergence of these new developments in technologies of communications does not require persons to move on-site, rather jobs can be done overseas and transferred to that particular location.

The digitization and computerization of many business services, development of software and hardware packages, international bandwidth connection at affordable prices and falling international telecommunication cost (figure-2.5) have all greatly contributed to the acceleration of off-shoring services.
(c) **Reduction in overhead and operating costs**

A detailed structure of this cost saving element has been depicted below following the model developed by Robinson and Kalakota and McKinsey (2003), which takes the cost base of Europe as 100 per cent. Outsourcing results in a 45 per cent cost saving on the original cost base (see figure- 2.6).
The cost saving in an offshore location has been broadly divided into three parts -

\[
\text{[Job Relocation Cost]} \quad + \quad \text{[Job Improvement Cost]} \quad + \quad \text{[Process Improvement Cost]}
\]

\[
= \left(\frac{\text{[Original cost base]} - \text{[Cost Saving due to total labour cost]} + \text{[total transaction cost]} + \text{[total monitoring cost]}}{100}\right) \times 100 \%
\]

\[
= \left(\frac{100 - 65 + 10 + 10}{100}\right) \times 100 \%
\]

\[
= 55 \text{ per cent}
\]

45 per cent cost saving on original cost base + [5 + 2 + 3 + 10] per cent = 20 per cent cost saving of offshore cost base

Total Cost Saving = [45 + 20] per cent = 65 per cent on the original cost base.

Besides labour costs an outsourcing company must also take into account various other hidden costs while evaluating the gains from outsourcing. Some of these hidden costs are briefly discussed below:
(i) **Cost involved in choosing the right vendor:** Vendor selection is a long drawn out process. This requires identification, sending request for information (RFI) to selected vendors, request for proposal (RFP), due diligence and visiting vendor's site.

(ii) **Cost of offshore transition:** The transition period will also depend on the degree of complexity, type of work, domain expertise, number of teams involved and size of the project.

(iii) **Managing human resource:** Training costs, sending team on-site, temporary lay-offs and re-training process must be considered.

(iv) **Cost related to cultural / communication issues:** Cultural and communication related issues may have a direct impact on productivity. Increase in communication time or cultural difference increases costs of the vendor.

(v) **Process and project management costs:** Processes must be improved and upgraded regularly. For measuring and monitoring performance and evaluate the result of outsourcing, setting up of Project Management Office is required.

(d) **Demographics and Large Pool of Human Resource:** The aging population and declining birth rates in developed countries will fuel the offshore fire. It is the older countries, such as India and China, rather than the younger countries, such as the United States, that have younger populations. India, China, Eastern Europe wave highly educated pool of people who possess IT knowledge and provide better quality services at lower cost.

(e) **Government Initiatives and Policies:** Over the years the opening up of policy in the name of liberalization has induced many restrictions on foreign exchange, dismantle control on foreign trade, and also move to a globally determined interest rate regime. Proactive and positive policy environment induces investments in the IT sector and that in turn boosts the BPO sector of the economy. Besides this, various exemptions in the form of tax holidays etc are aimed at boosting the off-shoring pattern of development of the IT sector.
(f) **Language**: India possesses the largest pool of English-speaking people among the developing countries (in fact more than China) which provides the basis for global sourcing in the IT industry.

(g) **Location**: Being located on the other side of the world gives the advantage of time difference to India and some companies find it a definite advantage. Work can be done 24 hours in various shifts.

Overall offshore cost savings account for 65 per cent on the original cost base. But some major concerns are expressed about the advantages of offshoring. It has also been argued that the cost advantages enjoyed by an offshore location do not remain stable over long run as new competitors enter the market. For e.g. call-centers moved away from Ireland to India as cost advantages disappear. So it may well happen that China may overtake India in future as labour costs are relatively lower in China as compared to India.

### 2.8 Suggestions of NASSCOM

NASSCOM (2008) has also identified the same set of factors (discussed above) for the success of the outsourcing industry. For sustaining long run leadership advantage it emphasized the following key issues:

1. **Accelerate trade development efforts**: India must work with its trading partners (through the WTO and other trade promotion agencies) to streamline trade in professional services. India should also request source countries to further strengthen their wage insurance and labour market programmes to cushion the impact of offshoring job losses.

2. **Improve talent supply**: India will need strong IT and BPO workforce to maintain its current market share. Our supply projections indicate a potential shortfall of nearly 0.5 million qualified employees -- nearly 70 per cent of which will be concentrated in the BPO industry. This gap can be bridged by the following initiatives: (a) expanding the pipeline of
people willing to join the industry; (b) improving the quality of the potential and current workforce; and (c) better matching jobs to people so that attrition is reduced.

(3) **Strengthen local infrastructure:** India needs to deliver on both basic (e.g., power, public transport, international connectivity) as well as business infrastructure (office and retail space, security services, etc.).

(4) **Drive operational excellence:** India-based IT and BPO providers have retained their cost leadership position despite increasing wage rates.

(5) **Effective employee retention strategies:** This is a key to reduce attrition in BPO firms. Intelligent employers always realize the importance of retaining the best talent. Retaining talent has never been so important in the Indian scenario; however, things have changed in recent years.