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OFFSHORING SOFTWARE DEVELOPMENT – CASE OF INDIAN FIRMS IN FINLAND

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ABSTRACT: This exploratory study examines outsourcing and offshoring of software development by analysing Indian companies in Finland. Based on qualitative data our results support the view that offshore outsourcing decisions are usually cost-driven. Another important motive has been the availability of software skills. To speed up the product development, some firms have outsourced maintenance and sustenance of existing products, which, in turn, has enabled the company to focus its in-house R&D resources on the development of next generation products and technology. In the future, offshoring software development will probably increase not only through outsourcing, but also through in-house operations. In addition to India, other potential locations include Russia and Eastern Europe.

KEY WORDS: Software, R&D, research and development, offshoring, outsourcing

ALI-YRKKÖ, Jyrki – **JAIN**, Monika, **OHJELMISTOKEHITYKSEN KANSAINVÄLISTYMINEN – INTIALAISET YRITYKSET SUOMESSA.** Helsinki, ETLA, Elinkeinoelämän Tutkimuslaitos, The Research Institute of the Finnish Economy, 2005, 14 s. (Keskusteluaiheita, Discussion Papers; ISSN 0781-6847; no. 971).

TIIVISTELMÄ: Tässä tutkimuksessa tarkastellaan ohjelmistokehityksen kansainvälistymistä ja ulkoistamista analysoimalla Suomessa toimivia intialaisia yrityksiä. Haastatteluihin pohjautuvan aineiston mukaan ulkomaille ulkoistamiset ovat pääsääntöisesti olleet kustannusvetoisia. Toinen tärkeä motiivi on ollut ohjelmisto-osaamisen hankkiminen. Tavoitteena on ollut nopeuttaa tuotekehitysprosessia. Ulkoistamalla nykyisten tuotteiden ylläpidon yritykset ovat pystyneet keskittämään konsernin sisäisen t&k-toiminnan uusien tuotteiden ja teknologioiden kehittämiseen. On todennäköistä, että ohjelmistokehitys tulee kansainvälistymään myös jatkossa sekä ulkoistusten että konsernin sisäisten muutosten kautta. Intian lisäksi mahdollisia kohdemaita ovat esimerkiksi Venäjä ja Itäinen Eurooppa.

AVAINSANAT: ohjelmisto, t&k, tutkimus ja tuotekehitys, ulkoistaminen, kansainvälistyminen

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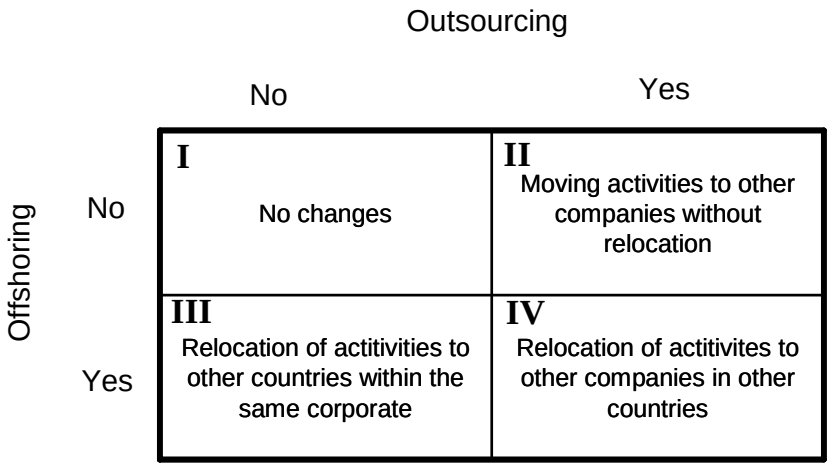
1 Introduction

Asia has attracted a significant amount of foreign direct investment (FDI). Although the majority of FDIs have focused on manufacturing operations, current offshore activities are not limited to production activities alone. During the past few years, companies have also offshored business services ranging from routine call centre activities to higher-value software development. The digitalisation and developed information and communication technology (ICT) has enabled relocation in sectors that traditionally were described as "nontradable" (see Brainard & Litan 2003).

India has risen to be a major location of offshore software development. A number of North American and European companies have relocated part of their software development to India. While some companies have established their own units in India, others have outsourced software development work to firms with offshore capacity in India.

Although outsourcing and offshoring are often used interchangeably, these terms represent two different dimensions. By outsourcing we mean that other firms take over operations that were previously conducted within the firm. It is important to note that relocation is not a requirement for outsourcing. Offshoring, in turn, is understood to mean relocating activities from one country to another but not necessarily from one firm to another. Possible combinations are summarised in the following figure (1.1).

Figure 1.1. Combinations of outsourcing and offshoring



In this exploratory study, we examine Indian software firms operating in Finland[1]. We focus on the operations, establishment motives and experiences of these companies. Furthermore, the division of tasks between India and Finland is also considered. Our qualitative data is based on interviews with Indian companies and their Finnish customers.

The paper proceeds as follows. In the next section, we briefly describe the current development of the Indian information technology (IT) sector by focusing on its globalisation. In section 3 we present the results of our qualitative analysis of Indian firms in Finland. Section 4 contains a brief summary and discussion.

[1] From the viewpoint of Finland and Finnish companies, these activities represent quadrants II (on-site work) and IV (offshore work) in Figure 1.1.

2 The software industry in India

2.1 The development of the Indian IT industry

The IT industry plays a significant role in the Indian economy (Figure 2.1). During the past few years, the IT sector has been one of the fastest growing industries in India. While in 1997 the IT industry accounted for 1.2% of GDP, in 2003 the corresponding share exceeded 3%.

The Indian IT sector proved to be the country's fastest growing segment even in the troubled times in 2001-2003. India has continued to be a compelling investment destination, as leading multinational companies either use Indian subcontractors or establish their own units in India. Outsourcing of IT requirements by leading global companies to Indian vendors picked up pace during 2002-03, in line with worldwide trends. The Indian software industry is, however, heavily fragmented with the top 10 players accounting for less than 20 percent of the total industry.

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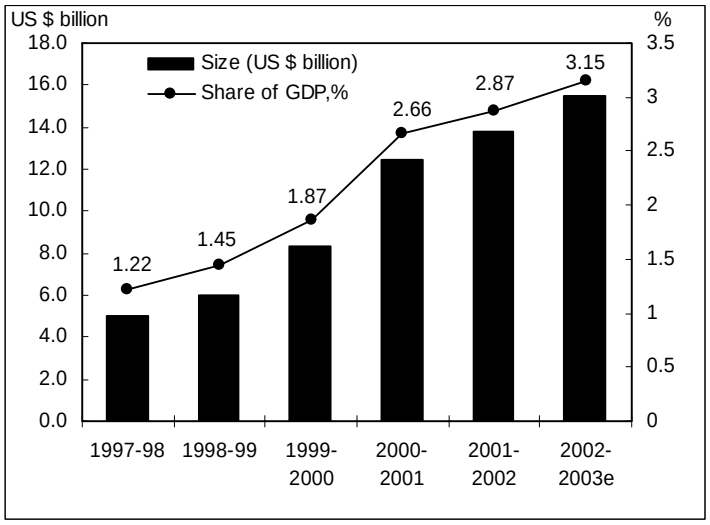
Figure 2.1. Indian IT market



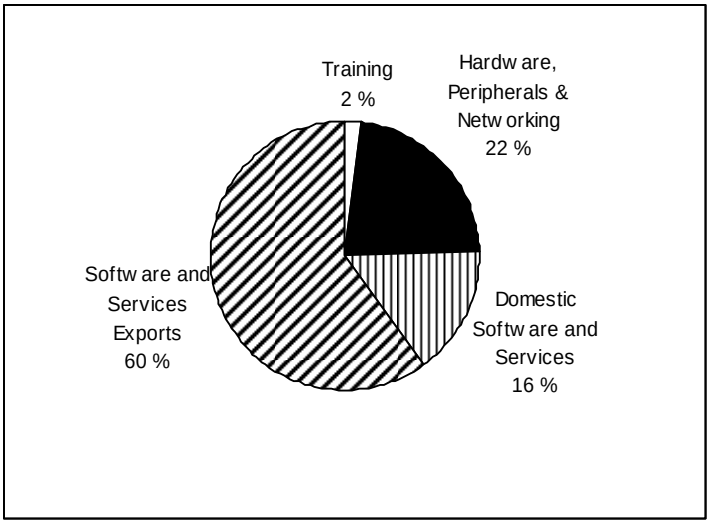
Source: NASSCOM

The Indian IT sector is heavily export-driven accounting for around 60 percent of the total revenue of the IT industry (Figure 2.2). The major trade partner of the Indian software and services industry has been North America but Europe and Asia Pacific have also been impor-

tant regions for the industry. The UK, Germany and France together account for over 75% of Indian exports to Europe. Within the Asia Pacific region, Japan continued to be the largest market for Indian software and services companies followed by China, Hong Kong, Taiwan and South Korea.

In terms of industries, the Indian software export companies have focused on the financial services sector. Approximately 40% of the total revenue comes from this sector.

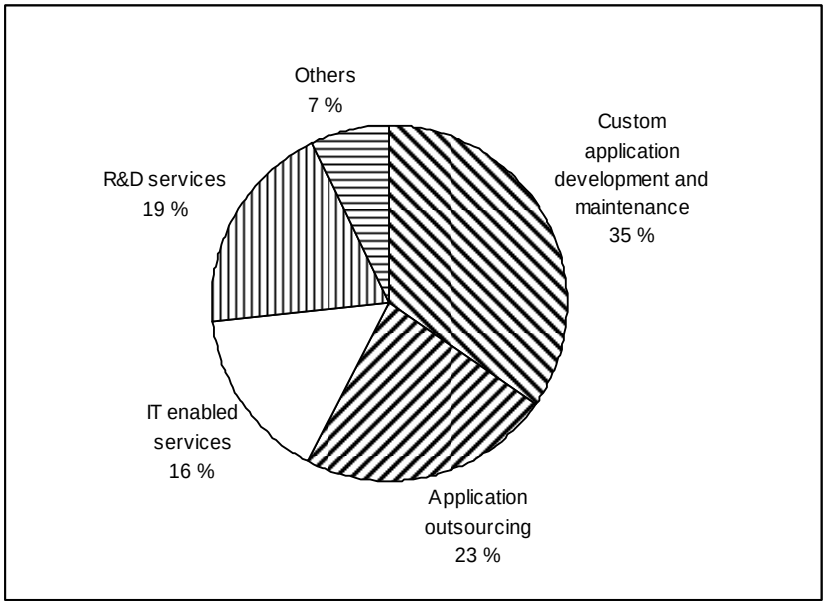
Figure 2.2. Composition of IT Market in India



Data source: Nasscom

Currently India has a high penetration in two IT services markets, namely custom application development and application outsourcing. In 2001-02, the revenues of the Indian software industry from custom applications development and application outsourcing were around US$ 4.4 billion (roughly 60% of total IT exports). The share of R&D services, such as product development and embedded software, is still rather low indicating that MNCs have not outsourced a significant amount of R&D to Indian firms (Figure 2.3).

Figure 2.3. Indian Software, R&D Services and Other Services Exports (2001-02)

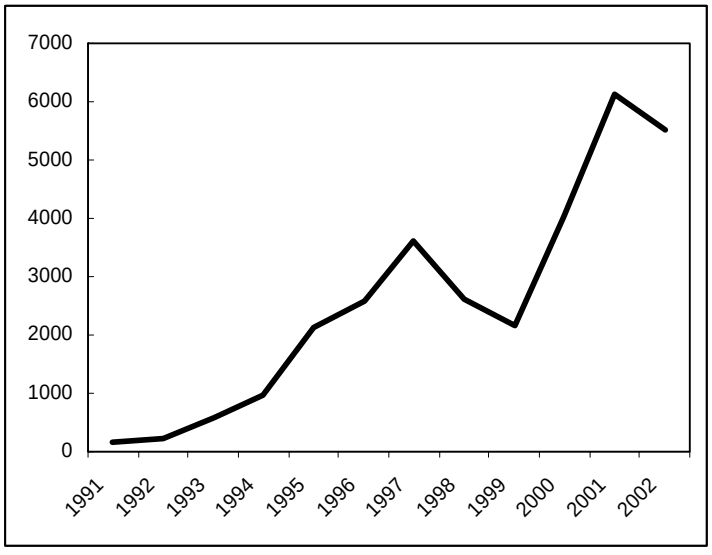


Data source: Nasscom

2.2 Foreign firms in India

In spite of the growing interest in India as a host country for FDIs, the absolute level of inward FDI to India is rather modest. In 2002 FDI inflows to India were US$ 5.5 billion representing only 3.5% of the total FDI inflows to developing countries.

Figure 2.4. Inward FDI to India, million US$



Source: World Investment Reports (1996-2003)

According to recent survey data (Bhaumik, Beena & Bhandari & Gokarn 2003), most of the foreign firms in India are from the U.S, Germany and the UK. The U.S and Western Europe together account for approximately 80% of the firms in the sample. However, the focus of North American and European companies' investment varies. A significant amount of European investment has focused on intermediate goods and machinery and equipment sectors while North American firms, in turn, have invested in the IT and financial services sectors.

Even though the survey indicate that foreign firms in India have small R&D budgets, the anecdotal evidence shows that a number of large multinational companies, such as IBM, Texas Instruments, Sony, Intel, Oracle, Huyndai and Nokia, have established R&D units in India.

3 Indian software firms in Finland

Currently, there are roughly half a dozen Indian IT companies in Finland. Starting in the late 1990s, Indian software companies have been interested in investing in Finland. Typically, however, they do not have a legal entity in the country. Even though currently only a few Indian companies operate in Finland, an increasing number of Indian firms have considered Finland as a potential location.

3.1 Motives for investing in Finland

Our interviews suggest that there have been two major factors affecting the initial decision of Indian companies to establish units in Finland. First, the Finnish market with a number of companies operating internationally has been seen as a potential customer base. While some of the Indian vendors are mostly interested in large manufacturing, banking and insurance companies, some others focus more on medium-sized companies. However, practically all the companies have seen Nokia as the most important and attractive customer in Finland.

> *'Why we came here [Finland] initially was because of Nokia.' (Indian vendor)*

The second establishment motive has been the reputation of Finland as a country with leading-edge technology. As one of the interviewees said:

> *' The Finnish market is important from the technology perspective.' (Indian vendor)*

Hence, Finland is not only seen as a promising market, but also to as a potential location to increase the knowledge level in at least two ways. First, the presence in the Finnish market helps vendors to monitor new technological developments in selected fields. Second, learning-by-doing and learning through experience add the skill base of vendors.

3.2 The benefits and risks of offshore outsourcing

The previous literature suggests that a key motive for outsourcing is simply cost reduction (see e.g. Girma & Görg 2002). Companies try to cut costs by contracting out activities that were previously performed in-house. One interviewee presented it as follows:

> *'The main thing really is to cut the costs as of now.' (Customer)*

While the wage level of a software developer may be 5-10 times higher in Finland than in India, the difference is remarkably small when communication and management overheads are included.

> *'When you are outsourcing, you have a distance management overhead. You have to manage that outsourcing. It's not so that you outsource and then forget it, and some day you'll get fine delivery.' (Indian vendor)*

The role of management and governance was emphasised in our interviews. In many cases, outsourcing does not diminish the need for management, but in fact it may require more management and management skills to monitor and control off-site vendors. By taking additional costs, such as management, communication, travel and cooperation costs, into account, our interviews suggest the cost savings from outsourcing offshore become clearly smaller than the labour cost difference, but they still are substantial. However, increases in software specialists' wages in India (which over the past few years have been increasing at an annual rate of somewhere between 15%-25%, according to one of the vendors) may change the current difference substantially. One interviewee highlighted this issue as follows:

> *'If the cost level [in India] will really increase by 10% a year, it might be a bigger disadvantage than many people think. Software competencies exist in many places in the world.' (Customer)*

Thus, though the potential cost savings are substantial, it is not easy to calculate them accurately because usually there is no such thing as a fixed-price contract. All outsourcing contracts contain baselines and assumptions. If the actual work varies from the estimates, the client will pay the difference. In most projects costs change by 10 to 15 percent during the development cycle.

In addition to cost savings, there are other motives for outsourcing. In some cases, outsourcing decisions are driven by the lack of in-house resources. In principle the company could undertake some activities in-house, but the lack of qualitative or quantitative resources push companies to utilise external capabilities. Hence, in that context the nature of the relationship between vendor and customer can be described more as partnering than as pure outsourcing. By using the talent pool of vendor firms, companies are potentially able not only to augment their internal capabilities, but also speed up their technology or product development processes. The following quotations illustrate this view.

> *'The main driver for collaboration with the Indian companies is the availability of software skills, and also in terms of processes maturity levels. Our own software processes level is not so high. Costs certainly are another factor.' (Customer)*

> *'We have heavily invested in R&D and we came up with certain building blocks of software… The same software development block, which we sell to one company, we can also sell to another company and build on top of it. Rather than start from scratch every day reinventing the wheel, we have these building blocks. So we offer to our customers something which is going to reduce time to market much more.' (Indian vendor)*

From the viewpoint of the customer, another route to accelerate product development is to outsource the sustaining and maintaining of existing products. Then, the firm is able to concentrate its in-house R&D on the development of new technology and the next generation product development. In these cases, outsourcing also serves as a means to reallocate in-house resources.

Even though outsourcing offers a potential route to speed up development, targets are not always achieved as the following quote shows:

> *'Time to market was a consideration, but with initial tests we are actually losing time, maybe we have not been able to define the interfaces well.' (Customer)*

In addition to benefits, collaboration in development operations also includes risks and disadvantages. A major risk concerns potential information leakage and data security, which distinguishes R&D outsourcing from production outsourcing (see. e.g. Lai & Riezman 2004). Hence, even though R&D could be cheaper from external sources, R&D outsourcing is only undertaken if it does not threaten the competitive advantage of the firm.

Another risk in outsourcing concerns the turnover of key personnel. Rapid growth among outsourcing vendors has created a dynamic labour market, especially in areas such as Bangalore, Gurgaon, Hyderabad and Pune. Key personnel are usually in demand for new, high profile projects, or even at risk of being recruited by other offshore vendors. While offshore vendors will often quote overall turnover statistics that appear relatively low, the more important statistic to manage is the turnover of key personnel on an account. Common turnover levels are in the 15 to 20 percent range, and creating contractual terms around those levels is a reasonable request. Indeed, the impact of high turnover has an indirect cost on the IT organisation, which must increase the time spent on knowledge transfer and training new individuals.

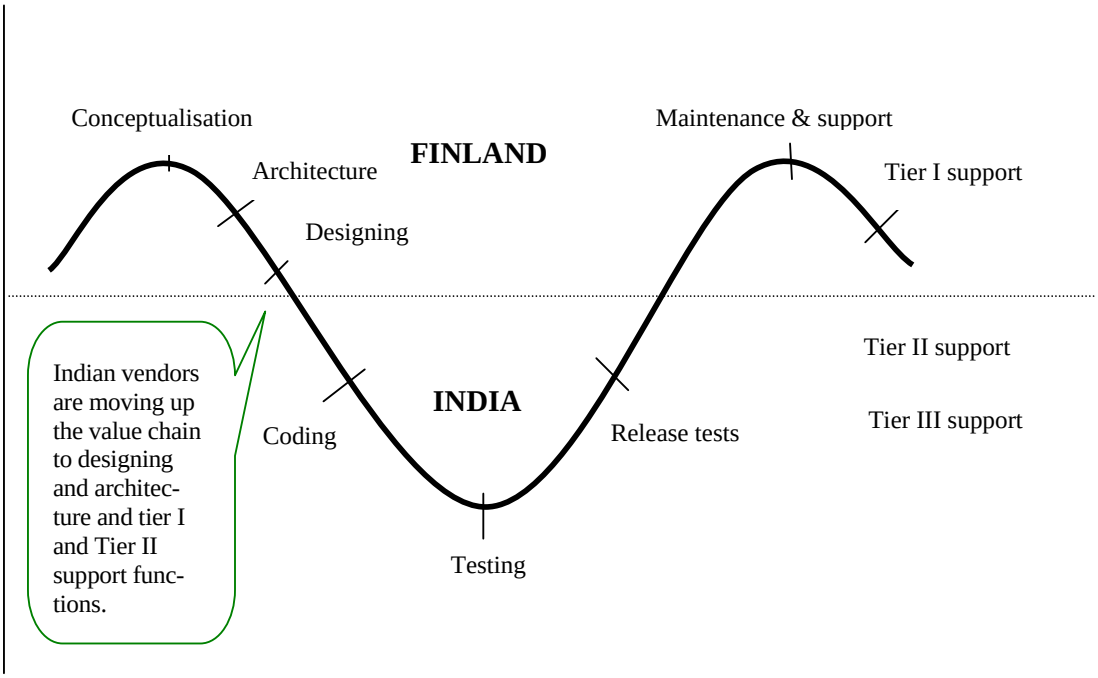
3.3 Division of work between India and Finland

Our interviews suggest that typically in software outsourcing projects with Indian companies part of the work is done in Finland (on-site) and part in India (offshore). The following quote describes the role of on-site activities:

> *'First, the most of the people we have in Finland are here because of a lack of skills within this country. And second, we have a coordination team here managing the Indian team. …so that the customer can see us as one organisation. So we have one team here, which interacts, with our teams in various places in the world. This is our global delivery model'. (Indian vendor)*

Still the division of work between India and Finland varies by projects, and the following figure presents stylised features of the division (figure 3.1).

Figure 3.1. Division of work between Finland and India in outsourcing software development



In a typical case, the original ideas and conceptualisation of software is done in Finland by the customer. In most of the cases, the customer also defines the software architecture. The vendor participates in the designing phase but the coding is mainly done in India. The following quotes describe the volume and the nature of the on-site and offshore work of vendors.

> *'The aim is to have a minimum number of people in Finland.' (Indian vendor)*

> *'Today, we have about 75-80 people in Finland, and a very large team in India where maybe close to 400 people are working for Finland.' (Indian vendor)*

> *'Exact specifications are given, only the coding is done [by Indian vendor] and then we check the quality, if it is according to the specs it is accepted.' (Customer)*

According to our interviews one of the key elements of outsourcing projects concerns the interfaces between outsourced and in-house elements. Without clearly defined specifications the delivery needs reworking and the cost savings are not achieved.

4 Future perspectives and concluding remarks

In this exploratory study we have examined Indian software companies operating in Finland. While in 2004 only half a dozen Indian software firms are operating in Finland, other Indian companies are considering Finland as a potential location.

Typically, Indian software firms use a combination of on-site and offshore work with their customers. According to our interviews, in 2004 Indian software companies employed approximately 200 employees in Finland. However, the total number of employees working in projects with Finnish companies exceeds this figure substantially. In India, roughly 1,000 employees of these vendors work on 'Finnish' projects.

The initial motives of these companies to come to Finland include seeking customers and augmenting knowledge. Practically all the companies interviewed have seen Nokia as the most important and attractive customer in Finland.

From the viewpoint of the customers, our results support the view that the most important motive for offshore outsourcing is lower costs. However, the additional costs, such as management and communication costs, make the cost difference clearly smaller than the wage difference between Finland and India. But not all outsourcing decisions are based on costs. Companies have speeded up their product developing process by using external R&D sources. While in some cases, the lack of in-house resources has pushed companies to use vendors, another reason is the use of external resources in maintaining and sustaining of existing products which, in turn, enables the firm to focus its in-house resources on the development of next generation products. Even though offshore outsourcing of R&D offers substantial potential benefits, it also includes risks and disadvantages. The crucial risk concerns information leakage and data security. Even if some of the R&D could be undertaken with lower costs externally, the threat of information leaks renders this option unattractive.

It seems that in the future, Indian vendors are moving up in the value chain to designing and architecture functions. This will probably mean that on-site work will increase. But offshore work will also increase through both increasing offshore outsourcing and in-house operations. However, Indian companies are not the only ones in offshore outsourcing market. For instance, Russian offshore companies are also interested in the Finnish market and they are potential competitors for Indian outsourcing companies in the future. However, it is not easy to

estimate accurately how substantial this development will be and more importantly what impacts the development will have on Finland. One interviewee described the future as follows:

> *'I think that we will increase our in-house R&D in India. It is not necessarily away from Finland but it is away from somewhere. Or the growth will be in India instead of the U.S. which is at least twice as costly as Finland'. (Customer)*

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