OPPORTUNITIES & CHALLENGES IN STARTING SOFTWARE COMPANY IN DEVELOPING COUNTRIES

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ABSTRACT

Starting a own software company is the dream of many entrepreneurs and information technology professionals due to high anticipated profit and low investment requirements. Due to increased new entrants and enhanced competition between many players, sustaining in software company business is more challenging than ever before. In this paper, we have discussed opportunities and challenges in starting a new software company in developing countries, and strategies to be adopted for ensuring its success in global competitive environment.

Keywords : Software Company, Opportunities for new software company, Challenges for new software company.

Introduction:

The word "software" was coined as a prank as early as 1953, but did not appear in print until the 1960s [Paul Niquette (1995)]. Before this time, computers were programmed either by customers, or the few commercial computer vendors of the time, such as UNIVAC and IBM. The first company founded to provide software products and services was Computer Usage Company in 1955 [Elmer C. Kubie (1994)]. The software industry expanded in the early 1960s, almost immediately after computers were first sold in mass-produced quantities. Universities, government, and business customers created a demand for software. Many of these programs were written in-house by full-time staff programmers. Some were distributed freely between users of a particular machine for no charge. Others were done on a commercial basis, and other firms such as Computer Sciences Corporation (founded in 1959) started to grow. The computer/hardware makers started bundling operating systems, systems software and programming environments with their machines [Campbell-Kelly, Martin (2003) and Fishman, Katharine Davis (1981)].

When Digital Equipment Corporation (DEC) brought a relatively low-priced microcomputer to market; it brought computing within the reach of many more companies and universities worldwide, and it spawned great innovation in terms of new, powerful programming languages and methodologies. New software was built for microcomputers, so other manufacturers including IBM, followed DEC's example quickly, resulting in the IBM AS/400 amongst others. The industry expanded greatly with the rise of the personal computer ("PC") in the mid-1970s, which brought desktop computing to the office worker for the first time. In the following years, it also created a growing market for games, applications, and utilities. DOS, Microsoft's first operating system product, was the dominant operating system at the time.

In the early years of the 21st century, another successful business model has arisen for hosted software, called software-as-a-service, or SaaS; this was at least the third timethis model had been attempted. From the point of view of producers of some proprietary software, SaaS reduces the concerns about unauthorized copying, since it can only be accessed through the Web, and by definition no client software is loaded onto the end user's PC. By the late 1980s and early 1990s, several countries began to emerge as significant software producers and some countries such as Irelandhad made firm inroads into developed countries, but had little domestic software industry from which to base their expansion [Coe, (1997b)]. Others came from the newly industrialized countries (NICs) of East Asia, including Singapore, Malaysia and the Republic of Korea. [Chin and Wang, (1989), Wu and Chun, (1989) and Lee and Lee, (1994)]. However, others began to emerge from developing countries, such as India and Brazil [Heeks, (1996), Gaio, (1992), and Prochnik, (1997)].

From the developing world, India has been the most successful in establishing a major domestic computer software and services industry [Heeks, (1996), Bhatnagar and Madon, (1997), &Balasubramanyam and Balasubramanyan, (1997b)]. The Indian computer software andservices industry has grown rapidly, in terms of its computer software and services trade. From virtually no exports in 1980, by 1994-1995 it had over $160 million worth of exports and its rapid growth continues. Between 1990 and 1998 exports increased by over 50 per cent per year. This trend is expected to be sustained. India is already a major producer of computer software and services world-wide and soon will be only second to the United States in terms of overall trade activity.

It is important to recognize that although there are substantial differences in size and growth of the computer software and services industry between developed countries anddeveloping countries, there are also substantial variations in computer software and services growth between developing countries. Newly industrialized countries, such as Singapore andMalaysia, although important in national development and policy terms, have not receivedrecognition as software and services centers as has India. A number of other developingcountries are now seeking to emulate India's computer software growth strategy. However, the question remains: what factors led to India's success and are these factors replicable for other countries to follow? These issues will be explored after a more detailed appraisal of India's software development.

Opportunity for New Software Company in Developing Country:
Despite the many attractions to developing countries, the computer software and services industry has had a very low profile and has been largely ignored by policy makers. This trend has recently started to change. The development requirements of the industry, despite the fact it is a

high technology and knowledge-based industry, centers on long-term, time-consuming anddifficult measures that involve creating sound institutional and educational frameworks that are effective at a local scale not on expensive, technocratic schemes. This effort usually requires "joined-up" Government schemes working together and requiring proficient organizationalabilities. Without these local cross-cutting proficiencies and strategic focuses many of the other potential barriers will simply not be addressed. There have been wide ranges of studies examining the impact of information andcommunication technologies (ICT) on economic development. [Antonelli, (1991), Nagy, (1994), Avgerou, (1998), &Bedi, (1999)] The provision and spread of ICT networks and the Internet remain at a very low level in many parts of the developing world. However, the nature and size of the ICT infrastructure, specifically the telecommunications network, has had a more direct impact on the growth and spread of the computer software and services industry. The computer services industry has come to increasingly rely on high-speed telecommunication networks and the Internet to transfer code, data and information across borders. Indeed, difficulties in both verbal and data communication were considered to be the most important disadvantage in a survey of global information technology sourcing. Without access to fast and low cost ICT networks, the computer software

and services industry will be constrained. Broadband/ISDN networks which an handle the data traffic associated with such data and Internet traffic are restricted in most developing countries, thereby restricting Internet use. However, the situation is changing rapidly on ICT provision. In Pakistan, there were only 80,000 Internet users in 1999 [Baqai, (1999)], but the telecommunication infrastructure is rapidly improving. In many other developing countries, computer usage and Internet access has increased significantly. For example, 30 per cent of Chile's computers are Internet-connected. Similarly, India's very low level of computer usage in the early 1990s rapidly grew by some one million Internet users by 1999 and is estimated to grow by an additional 5 million by 2001.

The pool of scientific and technical professionals available in developing countries and its power as an attracting force in software development should not be underestimated. It has been estimated that India has the second largest pool of English speaking scientific professionals in the world; second only to the United States [Nasscom, (1999)]. Moreover, the workforce is young. Although the median age of Indian software developers is 26.2 years, half of thissoftware professional workforce has over five years work-related experience. India alone, is adding 67,000 new software professionals to its workforce each year [Bagchi, (1999)]. Many other countries in the developing world have similarly large reserves of untapped scientific andtechnical workers. The skills required range from low skill occupations, such as data entry work, to more skilled activities involving source code generation and basic, entry-level programming work, to more advanced skills associated with leading-edge software and web-based work. There is a large manpower gap in the global software industry and these pools of scientific andtechnicallabor remain ever attractive to computer software and information technology firms. Despite the many attractions to developing countries, the computer software and services industry has had a very low profile and has been largely ignored by policy makers. This trend has recently started to change. The development requirements of the industry, despite the fact it is a high technology and knowledge-based industry, centers on long-term, time-consuming anddifficult measures that involve creating sound institutional and educational frameworks that are effective at a local scale not on expensive, technocratic schemes. This effort usually requires "joined-up" Government schemes working together and requiring proficient organizationalabilities. Without these local crosscutting proficiencies and strategic focuses many of the other potential barriers will simply not be addressed.

However, as noted below, by no means do all developing countries have an education systemcapable of turning-out suitably high levels of semi-skilled software workers. Even in India, where training programs are extensive, few colleges outside the main six Institutes ofTechnology can offer more than basic programming training [Kazmin, (1999b)].

The most obvious obstacle developing countries encounter in establishing a successful computer software and services industry is lack of financial capital. This is most evident in the number and

distribution of computers within developing countries and more indirectly to the availability and cost of advanced telecommunication services. Software development and the provision of computer services requires, not surprisingly, access to a computer, whereas the diffusion and availability of computers in developing countries still remains low. Buying acomputer would cost the average Bangladeshi more than eight year's income (compared with just one month's wage for the average American [UNDP(United Nations Development Program), (1999)].

However, the above cost-related problems also represent important opportunities for the initial development of the industry. A study revealed a key factor in outsourcing information systems work overseas was due to cost reductions associated with lower salaries [Apte, et al., (1997)]. The importance of low labor costs has also benefited the growth of India's software industry, although India's cost advantage over other low cost countries is narrowing. On average, Indian software engineers earned about $400 per month in 1997, which is still a tenth of the wages of their United States counterparts [Balasubramanyam and Balasubramanyam, (1997a)].

India has undoubtedly benefited from an Anglophone, low-cost skilled workforce. The industry itself and the Internet, in terms of websites and online databases, is dominated by the English language. The predominance of English can create major barriers for countries where English is unfamiliar. Language capability is important not only in terms of communicating with key clients, but is also crucial for the success of a good computer program [Correa, (1996)]. However, Chilean software companies have succeeded in offering clients in Latin Americaprograms in Spanish and have indeed been protected by being outside the English-dominant software formats.

The debate about the level of intellectual property right protection afforded by countries and their level of development in terms of high technology industries has been going on for many years [UNCTAD(United Nations Conference on Trade and Development), (1975, 1998, 1999)]. A recent World Bank study of more than 80countries found that the effect of intellectual property rights on trade flows in high-tech goods was insignificant [UNDP(United Nations Development Program), (1999)]. Similarly, another study found that the strength of intellectual property protection did not appear to be significantly related to research and development investments [Kumar, (1996)]. This can be explained by the type of research and development undertaken in developing countries that is less sensitive to the strength of intellectual propertyprotection provided. Great care needs to be taken in implying causality between intellectual property right protection and development of high technology sectors, such as computer software and services, or in terms of presenting uni-dimensional or uni-linear patterns of development in high technology activity.

By contrast, what may be termed the East Asian software development model of NICshas been seen to adopt a more supply-led and export-oriented, industrial policy-based programme of

computer software and services support. In Singapore, the sector has beensupported by a liberal programme of infrastructure spending on ICTs [Chin and Wang, (1989), Chia, Lee and Yeo, (1998), & Newlands, (1999)]. This has also been copied by Malaysia and Thailand [Pooparadai, (1999)]. Thailand, for example, is creating Phuket as an "intelligent island" which will attract software developers to set up computer service companies on the island. In the Republic of Korea, development of the industry has been supported by research and development programme funding and through Government demand stimulation, by way of the establishment of large public information projects [Wu and Chun, (1989), Lee and Lee, (1994)].

India is seeking to further expand itself as a major software centre. Two United States companies, Novell and Oracle, are among the most recent foreign multinationals to set up design centres in India. The software explosion, centred in Bangalore (known as India's "Silicon Plateau" and "Surf City") has occurred by way of three main routes, that are briefly outlined here. Firstly, forming joint-ventures (although sometimes running independent operations) with local Indian software companies, such as Tata Consultancy Services (TCS) and Wipro, to run software design centres, have hastened the explosion. Other examples of such operations include Mahindra-British Telecom, Tata-Unisys and IBM-Tata. More recently, with the easing of FDI legislation in India, overseas multinational computer service companies have set up software centres in their own right. Microsoft has set up a new 50 acre facility in Hyderabad's High Tech City (India now accounts for over 10 per cent of Microsofts world-wide workforce of 20,000 employees). Baan has also recently established a software development centre in Hyderabad. Secondly, major industrial corporations have set up sophisticated offshore development operations to generate software largely for their own use, but sometimes for resale. For example, Mahindra-British Telecom gained 85 per cent of its turnover from British Telecommunications in 1998, but this proportion is declining. Examples include: Citicorp, General Electric, Intel, Lucent Technologies, Motorola, Siemens and Texas Instruments. Lastly, domestically-owned companies themselves continually garner increasing amounts of overseas trade. For example, CMC, a major Indian computer service company, has won contracts overseas providing software for London Underground and La Suisse Insurance. More recently, Indian companies have started to set up overseas subsidiaries in major developed economies. The United Kingdom has been a predominant base for Indian software companies seeking to expand into Europe. Mastek, for example, has set up a subsidiary in Bristol which employed 250 people in 1999 and had a 1998-1999 turnover of some £14 million. Similarly, Maars set up its European operations in Berkshire, and together with its subsidiaries in the United States, Australia, Singapore and the Middle East, now employs over 300 people in these overseas units. Satyam also has a software development centre in the United Kingdom and four others in the United States and one each in Singapore and Japan.

These trade-oriented companies have displayed remarkable growth rates. The top twenty software firm exporters all recorded growth rates of more than 200 per cent between 1996-1997 and 1997- 1998 Infosys Technologies, a top ten Indian software exporter, waslisted on the NASDAQ (National Association of Securities Dealers Automated Quotations),an American stock exchange in 1999. Exports accounted for 97 per cent of the company's revenues in 1998 Tata Consultancy Services, India's largest computer software andservices company alone hired 4,000 new software engineers in 1999. The employment growth potential of these trade -led companies should not be underplayed. Althoughcost may be an initial factor in basing operations in developing countries, these economies are now seeking to upgrade and develop their skills and move into more sophisticated high value areas of software generation and development.

Challenges for New Software Company in Developing Country:

India has branded itself as one of the favourite destination for application development outsourcing, owing to a great combination of lower cost and high quality IT. It has been playing a major role in the global market and has claimed the benefits of the globalization opportunities in a wider way. IT sector of India has largely developed over a period of decade but it is still in its developing process. In Indian IT sector, the techies are working harder and harder to generate better revenue from the domestic market. Various challenges have eroded the research and development levels, about which we need to be alert and proactive in order to align the strategies and decision-making with various opportunities in the current market. These days IT sector is like a game of "two steps forward and one step backward", and that's in the good days. In other days, it is most definitely one step forward, two step backward and you trip over because you don't see anybody sneaking up and you and that somebody treads on your face while you are lying on the ground. The United States have always been India's largest trade partner, source of foreign money investment and external job opportunities for the Indians. Any downfall or slow of the US economy is likely to hurt India more today than the past times. The US economy is a credit-driven economy sustaining on scrounged capital. What characterize the economy are high savings consumption and fewer saving. The preeminent behavior has led to credit being extended to borrowers who do not have the capacity of repaying, resulting into high default rates, turning into losses in the financial system. There are high signals of slowdown in the US economy- rising unemployment rate, large credit defaults and falling real estate prices which are heating up the Indian economy and heading towards slowdown in growth. Some of the major challenges faced by Indian IT Companies are :

1. Expensive & Unskilled Manpower

IT industries have become expensive due to rapid increase in the cost for the manpower. There has been regular increase of salaries by 10-20% every year. This increase in the salaries without correspondent increase in output levels per person is eating into the profit levels of the Indian IT

companies. In the earlier times India provided "less expensive, highly skilled manpower"; currently it has run out of that "skilled" manpower and whatever manpower is available is either not skilled enough or highly expensive.

2. Management

While talking about management skills, questions are raised about the quality of management in IT sectors due to relatively low levels of skills in manpower and overall business performance. Managers must possess a combination of specific competences and softer skills and attributes to manage and motivate employees. Changes in technology and organizational changes can create a need for managers to continually develop and enhance their competencies and their personal attributes as part of an ongoing development process.

3. Security

The failure to address security problems today is by and large caused by organizational issues, not technological limitation. The major organizational obstacles to an effective security program are- when many companies aren't even aware of the attack, whether internal or external, the majority of companies with massive security suffer from head in the sand problem. The other obstacle arises when though you have a good security team that knows what the issues are, more often than not there are major organizational obstacles to actually solving the problem. Political battles, turf wars etc, destroy the effectiveness of more security programs than the lack of any product or technology. To be an effective part to have a more secured technology, one should have Knowledge of what needs to be done; Empowerment to make the necessary changes; and Talent to execute it properly.

4. Customer service

One of the challenges faced by IT sector in India is to improve customer service by listening to and meeting the client's need. IT has been suffering from bad reputation when it comes to satisfying customer needs. Many a times, the work is done incorrectly or not upto the customer's satisfaction and requirements and it is at the end the customer who ultimately determines what is good and what not.

5. Human Resources

There is a high need to develop creative ways to minimize stress, satisfy employee needs, and match corporate needs to employee goals. Being in the developing country, workload is increasing day by day, a relaxing break is must- anything that can give IT professionals a break should be considered to retain valued employees leading towards growth of the nation.

6. Others

There are many more challenges which are somewhere the other side, hampering as well as boosting up the spirits of techies. Increasing productivity, Maintaining and accomplishing tasks at a time, managing budgets, creating good public relations/marketing, multinational operations etc, such challenges have been at times difficult to overcome but they have encouraged the IT-techies to work harder and harder to setup and enhance the growth of the country's IT sector.

Strategy for New Entrants:

Thinking business means thinking differently. Here is a solid Strategy for the entrants of Software company.

1. Focus Right: Software Product or Software Services?

The software industry has fantastic potential for those with the right talent and understanding of how to run a business.As a business owner, you need to first decide an area of focus in the industry. There are mainly two sectors in the software industry:

•   Software products

•   Software services

Software products or programs are a set of applications developed for particular tasks. Software products can target individual business or home users. Software products are also developed to target a particular market segment. For example, there is a suite of programs that helps users take care of all their office paperwork including writing letters, preparing charts, invoices etc. Then, there can be a software package for a particular car manufacturing company to generate Order Management, Procurement, Forecasting, Delivery Management, stock inventory etc. An organization can also hire your software company to tailor-make special software products for their staff. For example, a magazine company may ask you to re-design an existing word processing package to suit their translation needs for English and Spanish.On the other hand, software services cover marketing or maintaining software products that might have been developed by your company or someone else. It can also include custom software migration like helping a company move its existing records to a new system. It can also include book-keeping, maintaining records, a subscription list, salary accounts etc.When you start a business you should carefully evaluate your initial investment capacity and human resource available to you. Conduct a survey of the market and see how other companies in the same area as yours are functioning.

2. Balancing Act: Hiring Technical Team First or Sourcing Software Projects First

Clients are crucial. So is your team that will do the job. Obtaining contracts and then hiring a technical team makes more sense. You could hire specifically according to the requirements of the project.As your company grows you could keep a multi-talented team working on different projects at the same time.The trick is in having a team that can complete a project successfully according to the client's requirement. This will help you build a good brand image. A good brand image means more projects and more profits. Once your confidence in your team, you can hire more people to expand the expertise area of your company. Hiring a team when your company still has to look for projects would mean keeping staff idle and paying salary without work. It would also demoralize your team.

3. Having a Business Partner or Not To Have Partner

Let's face it. It takes two to tango. But if both people tango to different tunes you've got one miserable situation before you.Deciding to launch a company by yourself or having a business partner is a question you alone can answer. But either way, one thing that has to be clear at all times is to decide who is in charge. Just because someone makes a great friend, neighbor or spouse does not mean that they would do an equal great job at being business partners.List your reasons for choosing a business partner. If it is for access to bigger investment capacity, technical help etc. then it makes sense. Do not choose a business partner for emotional reasons ever unless you want to sink your ship.

4. Customer Target Location :

If you want to stencil something on the walls of your office make it: Customer target location. You can have the best product on the planet but if your clients don't need the product what use would it be? The Internet has made the global market accessible to smaller companies. The flip side is that the Internet has also made competition tougher. Therefore, it is essential to focus on a small group in a particular location.Forexample, you are developing a software package for a school. The software package has to keep track of the attendance of the school's teachers. It is very important to begin by focusing on that individual school. Figure out how other schools are functioning in the city. That ways you can have both a micro and macro view of how your team could develop the project that would eventually have potential beyond a single client. Conduct a comprehensive market research. Start small. Mark out a local area first and see how best you can tap it. Try to understand the very basic local needs that you can take care of through your software company. Once you start small and focus on a core location you can build profits and client base.

5. Biggest Challenge: Making Sure You Will Have Ongoing Software Projects or New Web Development Projects in Pipeline

The experts call it the double-bill advantage. On the one hand, you can run your company at a pace that suits you. On the other, there is no sitting back with a pipe to smoke. You have to remain on a constant trajectory of growth. If you don't have a steady inflow of projects, the company is bound to sink.As a business owner you must keep track of new clients, market changes, new options, new projects etc. It is like keeping an oxygen pipeline in place.

6. Software Outsourcing or Not To Outsource

There is a lot of confusion about outsourcing. Outsourcing works best in certain instances only. One of the most logical reasons to outsource is when your existing staff strength is not enough. However, outsourcing also means risking delays and quality compromise. Overall, you must evaluate whether you really need additional help. Most people wrongly assume that outsourcing is always cheap. This is not so because monitoring outsourced work is far more difficult. You could end up with higher costs with outsourcing if things backfire. But the decision has to be taken only after you have carefully evaluated every single aspect of outsourcing. Set aside at least a week to take a decision on how and from where you could go for outsourcing. Balance that with a cost-estimate. You may find here Software Outsourcing Partners.

7. Talent, Talent and Excellent Talent

You can have billions of dollars at your disposal but if your staff is of mediocre talent you will only end up wasting all the investment. However, having highly talented employees who cannot work together would get your company nowhere. Choose wisely when picking employees. Take your time building a team that can work harmoniously together and deliver quality work. In the final evaluation, the quality of service you provide to your clients will matter.

Conclusion:

Over the last two decades, the software industry has been experiencing high growth rates and the increasing international spread of computer software and services. Although it is far from universal, this sector has the potential to be one of the most internationallydispersed high-technology industries in the world. Computer software and services activities hold vast opportunities for developing countries primarily due to low capital entry requirements as well as the industry's high value, high growth nature and the high technology, knowledge -rich profile of software activities. Above all, although developing countries face barriers in theestablishment of the industry (especially least developed countries), they hold a number of notable locational advantages. To date, only a small number of developing countries have moved into more mature indigenous growth and development patterns. Nonetheless, the industryprovides almost unique and unparalleled opportunities for the wider development and growth of developing countries, which should not be ignored. Of all developing countries, India has been by far the most successful in terms of establishing its software industry, however, its own uniqueness raises

replicability problems. To date, very few developing countries have gone beyond the early stages of development, diverse contexts and prospects for development call for bold, new strategies. Comparisons are difficult and success factors (as well as barriers to development) for individual countries may be substantially different. Difficult policy decisions need to be considered carefully prior to jumping to easy conclusions based on earlier successes (such as in India, Chile, or Brazil). A carefully designed development policy for this sector is highly recommended to suit the specific needs of particular countries. It would be highly advisable to seek advice and support from theinternational community in designing a policy framework aimed at stimulating and encouraging development of domestic IT industries and services.

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