

# Strategically Strengthening The Software Export Sector: A Benchmarking Comparison Of National Experience

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## ABSTRACT

*Software as a product for export has proven to be a major economic engine in several economies, including those of India and Ireland. Current development efforts underway in Costa Rica by a variety of firms contribute to the potential for software development to become a key export sector in the Costa Rican economy. However, potential roadblocks in the form of governmental restrictions could impair the sector's promise and inhibit the growth the sector is capable of encouraging. In order to identify strategic priorities to strengthen the software export sector, a comparative study of the situation in Costa Rica and key factors for successful software export are discerned. Heeks and Nicholson (2002) investigated three countries noted for their success with software exports: India, Ireland and Israel. Success variables previously identified by researchers were analyzed by Heeks and Nicholson, producing five key factor dimensions identified as contributing to the success of those three economies. It is these five key factor dimensions on which Costa Rica's current situation are assessed.*

## INTRODUCTION

The Costa Rican economy is one of the strongest in Central America. The location there of many transnational firms production or marketing facilities including those of Intel, Baxter Medical, and Cisco evidence the movement of that developing nation into the modern era. The days when Costa Rica's economy was driven by the so-called dessert sector (sugar, pineapple, bananas, and coffee) are over. Costa Rica's production sector, and especially its high tech production sector had allowed that country to move into the modern mainstream.

Software development as a major export sector, while relatively small is beginning to make its presence felt. It is with the intention of furthering that sector of the Costa Rican economy that this comparison is undertaken.

It should be noted that the three economies assessed by Heeks and Nicholson – the “3Is” – did not become overnight success stories. They began their movement into software development some three decades ago. Still, recognizing and understanding what helped move the 3Is into the forefront in the software export market may assist Costa Rica in following a similar path.

Heeks and Nicholson (2002) began with a variety of variables from several researchers and analyzed them into five usable success dimensions. The five success dimensions identified by Heeks and Nicholson include:

- 1) Demand
- 2) National vision and strategy
- 3) International linkages
- 4) Software industry characteristics
- 5) Domestic input factors and infrastructure

An enquiry based on the model was prepared to investigate the situation in Costa Rica of each of the model's components according to the opinion of local entrepreneurs. The survey was applied to 34 software export companies' general or marketing managers and members of the Chamber of Information and Communications Technologies, known as CAMTIC (for its name in Spanish). In search of a more thorough investigation in some results, experts from CAMTIC and CAATEC were consulted. CAATEC stands for Comision Asesora de Alta Tecnologia (essentially the Advisory Commission for Information technology).

Each key success factors' results obtained from this enquiry are presented.

1. Demand: first key success factor

The software industry is in an early if not initial development phase. During the last two decades, demand has been continuously growing. The three leader countries that inspired the model, have directed their effort mainly towards attending international demand. During this time, there has been a gap between supply and demand motivating other economies to enter the market.

Nonetheless, demand is in a state of evolution and according to IDC (2006) software demand as a service, known as SaaS (software as service) has the greater growth perspectives: in the United States it will grow 28% between 2005 and 2009 and at least 19% in Spain. According to Cabré (2006), this option takes advantage of broad band generalization and offers quality applications, it is flexible, based on product rental for a certain time, it does not require installation in servers and if expectations are not met, the contract can be easily canceled.

In Costa Rica, according to Software National State (2005), the business park is comprised of approximately 150 developing companies of which 46% export. Of those who export, 44% of those have been exporting for five or fewer years, while 56% have more than five years of exporting experience. Some 95% of software export firms are located in the Great Metropolitan (San Jose) Area.

The first five main exports destinations mentioned by the respondents are: Central America (38%), South America (25.7%), United States (11.42%), the Caribbean (11.42%) and Mexico (4.28%). Of the respondents, 80% of interviewees said their companies export to more than one destination and 36% export to countries with different languages (other than Spanish). Other destinations mentioned are Great Britain, Canada, Taiwan, Jordan and Italy. The two biggest firms involved in the study mentioned the United States as their sole export destination.

Of the respondents, 88% report their firms have grown during the past 5 years, innovation driving the majority of their growth. Specialization as a means to achieve growth ranked in second place while developing alliances placed third as the reason given for the firms' growth rates. In general, managers consider international demand for the type of software they offer as being in a growth mode.

Several leaders in the sector were questioned on a personal basis. Experts Monge and Hewitt think the potential for growth is true if, and only if, industry evolves adequately, orienting to niches with specialized software and understands the need to evolve from product to service. Additionally, experts Mora (2007) and Rivera (2007) while recognizing the opportunities presented by this tendency cited Costa Rican businessmen's needs to take advantage of this opportunity, and concern especially in regards to technological infrastructure and related services. They also point to the growing prospects of international competition in the region.

2. International links and Trust: second key success factor

This factor is underscored by the belief that relations between providers and customers need to be of a long term nature. For this reason building international links and trust stand as a key for success. The governments of the 3Is promoted such linkages through offers of fiscal and non-fiscal benefits for participation (Heeks and Nicholson 2002).

Mobility and migration have played roles in this factor. Heeks and Nicholson mentioned that during the first stages of development, professional migration or brain drain was observed- and linkages were easily made since firms from the 3Is were dealing with expatriates who had left previously for ostensibly greener pastures. Later, success from these linkages possibly caused a type of reverse migration or return of professionals to their home countries with the intention of investing in industries there.

Other important measures taken by companies to strengthen trust are certifications such as those offered by CMM or ISO. It is also common practice for companies from the 3Is to have subsidiaries in their client's countries. This local presence is seen as another avenue for developing linkages and trusts among the clients and the providers.

In Costa Rica, 71% of surveyed entrepreneurs believe it is very important to make strategic alliances with international software companies to market their products. In relation to quality, 55% believe it very important to have international quality certifications like CMM or ISO. However the Software National State (2005) determined that 95% of companies have made no effort towards obtaining any of these certifications. Along this line, Hewitt (2007) and Monge (2007), believe this factor depends on the aspired market and believe certification practices will be favored when the market becomes more demanding.

### 3. Software Industry Characteristics: third key success factor

Even though the 3Is present three different experiences, Heeks and Nicholson identified three characteristics the 3Is appear to have in common:

- Active competition between companies which are typically medium-sized (from 50 to 500 employees).
- “Clustering” of firms geographically in major centers. Some benefits of geographic concentration are easy learning of best practices and local support for infrastructure.
- High collaboration between companies evidenced by a willingness and ability to work for objectives that would bring a level of common good to all participants. Collaborative support for pooled international marketing efforts, market research, and other initiatives supported by either professional associations or government agencies to advance the industry's efforts and impact.

Costa Rica's business park is formed mainly of highly productive PYMES (SMEs, small and medium-sized enterprises). One might expect that with such a large group of small and medium enterprises, cooperative efforts would prevail. Sadly, that may not be the case.

Of the respondents, 53% consider that cooperation level between software companies in Costa Rica is low despite the fact that 95% of them operate in the Great Metropolitan Area. Hewitt (2007) and Monge (2007) think that cooperation has been initiated with groupings or associations for efficient lobbying to try to improve the climate for business conditions for the sector.

### 4. Local factors and infrastructure: fourth key success factor.

According to the Heeks and Nicholson, there are three keys that stand behind local factors for the business environment to favor software exports: talent (human capital), technology (infrastructure and telecommunications) and financial support. The abilities, expertise and size of human capital are the most important factors and were observed in all three countries; policies for improvement of superior technical education were also observed.

Regarding human capital, education and English language abilities were seen as paramount to the quality of the human capital in fostering a software export sector. Further, knowledge of customers and their needs, knowledge of international regulations, and knowledge of the software market all contribute to the quality of the human capital component of the sector.

Relative to technology, it is important that a level of technology equal to or greater than the client country be available to the provider. If this is not available universally, Heeks and Nicholson (2002) proffer that it should be

at least available in the cluster areas. By having the technology and the communication abilities to serve the needs of the customer, the supplier will be in better position to close a deal.

Concerning the financial factor, the governments of the 3Is stimulated risk capital investment to software developers and incubators. They have used different fiscal incentives strategies, marketing subsidies, scholarships, loans and elimination of bureaucratic barriers to make local providers more cost competitive with those from without. The financial commitment is a must if the other factors of success are to succeed.

In Costa Rica, 79.4% of consulted entrepreneurs consider there is a low availability of persons with the competencies they require to be competitive. Some 70% of respondents consider availability of required telecommunication infrastructure conditions to be low. Relative to financial support, 52% consider there is low availability of required financial services. On the plus side, a majority (59%) believe there is a high level of facilities for research and development in the field, available.

Availability difficulties concerning personnel concentrate on people for development, system support and networks at technical levels, and command of technical English. Both Mora (2007) and Rivera (2007) are in agreement that there is an urgent need to prepare personnel especially at a technical level, and they would consider revising migratory options, as an alleviation strategy, in order to facilitate foreigners' mobility to Costa Rica to permit attending to this necessity.

#### 5. National Vision and strategy: fifth key success factor

From a software export perspective another success factor common to the 3Is' economies was an identified: clear vision and defined strategy for the sector. The importance of a vision and strategy shared and shared by government leaders and entrepreneurs (Heeks and Nicholson 2002) is critical to the success of the sector. Government leaders, entrepreneurs and other drivers of the sector need to share a singular vision for success. They need to work in concert towards a goal of national, broad-based success. While the visions and strategies among the 3Is differed, apparently they were shared and impelled by a relatively small group of government officials and entrepreneurs who were intent on their attainment. The three strategies were singularly defined but flexible. As may be surmised, the strategies required the development of some organizations and/or institutions for their attainment.

The survey indicates that many Costa Rican entrepreneurs fail to realize a clear national vision or strategy; however, they contribute with various approaches for a possible construction. Most common ingredients in their response to the market are: quality products, international marketing with government support, professionalism, specialization, a nod to assuring customer satisfaction, and competitive advantages: English mastery, same time zones as important markets for outsourcing and niches firms are able to recognize and react to in a competitive fashion.

## **CONCLUSIONS AND RECOMMENDATIONS**

Heeks and Nicholson's model (2002) is a useful guide to identify strategic priorities. Software demand is evolving towards software as a service, making it necessary to continue research in order to dimension the degree of preparation of Costa Rican entrepreneurs concerning new requirements and opportunities demanded by software as a service.

Software exports are relatively new to Costa Rica and only half of the companies have exported for more than five years. Concerning destinations, export is diversified and 80% export to various destinations; however, only 36% export to destinations with a different language. Entrepreneurs declare their companies have grown in the past five years; they are optimistic about future growth and think their success is based on innovation, specialization and alliances. Most entrepreneurs consider as important the attainment of quality certification, yet only 40% have made real efforts to obtain them.

Costa Rica has a software supportive business park formed mainly by highly productive PYMES (SMEs - small and medium sized enterprises). In sum, 95% of software development companies operate in the Great Metropolitan Area. Still, 53% consider there is a low cooperation level between software companies in Costa Rica.

According to the responding entrepreneurs, the main restrictions they see for the sector's development and strengthening are: less than optimal availability of individuals with required competencies, low availability of required telecommunication conditions and low availability of required financial services, in that order. Availability difficulties concerning personnel concentrate on individuals for development, system support and networks at a technical level who have a command of technical English.

Immediate and innovative actions from the education sector together with the entrepreneurial sector are necessary to develop a core source of individuals required by the sector in order to continue with its international aspirations. In addition to training programs, strategies to facilitate necessary migration to attend the need of prepared personnel in the short term must be investigated.

Due to the demand tendency for SaaS, attention to value creation niches is recommended; for which business sophistication and innovation is necessary, as well as attention to growth of international competition and efforts for differentiation.

Consulted Costa Rican entrepreneurs fail to see a clear national vision or national strategy, although they provide the ingredients: quality, international marketing with government support, professionalism, specialization, customer's satisfaction, and a location in the same time zone as important markets for outsourcing. Team work between public and private sector is necessary in order to build a clear and shared vision with a future. As the 3Is found, cooperation between the public and private sector, with a shared vision and strategy can lead to success.

#### **AUTHOR INFORMATION**

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