Revisiting The Software Industry In Costa Rica: Achievements And Challenges

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ABSTRACT

Costa Rica's economy like that of many developing and developed nations is largely service-based. The information and communication technologies (ICT) sector plays an increasingly key role in strengthening the service aspect of the economy. A large part of the ICT sector is the software sector. This study is an update of a review of that sector's contributions conducted in 2008. In that effort, software producers' characteristics and needs were investigated. The current article investigates the evolution of the sector and its competitive position in the business sector. The study is national in scope and represents a random sample of firms in the industry. The findings highlight the achievements and remaining challenges for the industry and provide public policy recommendations.

Keywords: Costa Rica; Service-Based Economy; ICT Sector

INTRODUCTION

The evolution and advancement of the software industry in Costa Rica was previously investigated in 2008 ((Brenes and Govaere, 2008). That study reported on national indicators of science and technology advancements and the results of a survey of companies producing software. In addition, Baraya, Brenes and Budden (2008) discussed how variables important to the success of a tech sector as identified by Heeks and Nicholson (2002) in a previous study applied to the situation in Costa Rica. It is safe to say much has happened in the software industry of Costa Rica during the past seven years.

Heeks and Nicholson (2002) found five key success factors played a role in the technology sector. Those five factors include: demand, national vision, international linkages, software industry characteristics and domestic input factors and infrastructure. It is a desire to assess the current state of the ICT sector that led to this study.

The current study investigates the evolution of behavior that has characterized this sector in recent years. Recent, relevant international studies were analyzed and during 2013 a survey of a random sample of companies producing software and registered in the Chamber of Industries (Commerce) was conducted, similarly to the original 2008 study. Perceived current conditions in the sector and expectations and opinions of sector players are reported.

The importance and limitations of the software industry in developing countries play a role in the sustainability and impact the sector plays in economic development. In the report *The information economy in 2012: The software Industry and the Developing Countries*, promoted by the United Nations Conference for Trade and Development (United Nations, 2012), the importance of the sector in producing and developing software geared to the needs of local markets is emphasized. Given the greater access to information and communication technologies, by means of the increase in the use of mobile telephony, the improvement of broadband connections, and improved access to technology in rural areas, new opportunities and new markets for software production aimed at improving information technology in such countries is gaining momentum.

The authors of that study note that despite the importance of exports of software and services for foreign exchange earnings, employment and technology transfer should also be disposed of software capabilities and services to meet the needs of both the private and public sectors in each country (United Nations, 2012; p. 6): "...the use of the software at home can be a key to improving the competitiveness of enterprises and the welfare of society members. The domestic market can provide the basis for enterprises to gain practical knowledge and develop innovative products." Moreover, based on the results of a survey of IT organizations and software services, in the same document the main obstacles to the development of the software industry in each region are identified. Specifically in Latin America and the Caribbean, the two most-frequently mentioned problems are the limited access to venture capital and the lack of qualified human resources.

As a result, the role of government support is considered essential for capacity building and development of the software sector. The government is also potentially a major consumer of any products produced by the sector. Governments desiring to advance the software sector need an orchestrated, coordinated effort to promote and sustain the sector. Key recommendations for public policy include efforts to develop infrastructure, the promotion of job training, the development of legal protections for developers and encouraging interactions between users and producers via international networks (United Nations, 2012, p.9).

Behavior of Scientific, Technological and Innovation Development in Costa Rica

The document, *National Indicators 2010-2012* prepared by the Ministry of Science and Technology of Costa Rica (MICITT, 2012) provides a set of national indicators related to scientific and technological development and innovation over the past few years. Some of the key findings in this report are:

- Investment in scientific and technological activities (ACT) has fallen relative to Gross Domestic Product (GDP), resulting in the largest reduction in the public sector. Also, the amount of investment in research and development (R & D) has reduced 0.5 % of GDP in 2010 and 0.46 % in 2011 due to the decline in investment in the public sector and business sector.
- There is a significant difference in R & D related to research in engineering and technology during 2010 and 2011, representing 23% of total investment in R & D.
- Most researchers within the country work in the academic sector (over 60 %). This sector is where the largest number of researchers with doctorates, masters or specialist degrees is located.
- The indicator relating to the number of graduates in science and engineering per thousand people aged between 20 and 29 years (indicator of relevance for scientific and technological development) shows an increase from 8.6 in 2006-13 graduates, 1 in 2011.
- Based on the national survey of science, technology and innovation in the business sector, it was found that 90% of firms are making efforts to innovate, but only 20% reported producing something really new to the market.
- Limitations keep on appearing in the national financial system to provide resources to support innovation processes in the companies.
- The Internet is seen as the main source of information to develop innovations in enterprises.
- The use of the Internet for these firms varies, but the great majority uses it for banking.

Latest Survey Results of Costa Rican Software Developers

As mentioned, an earlier study was conducted of the software industry in Costa Rica in 2008 and its findings published (Brenese and Govaere, 2008; and Baraya, Brenes and Budden, 2008). In 2013, there were 127 firms registered as being software producers in Costa Rica – an increase from 109. This 16.5% increase is impressive in size, however, only 34 (27%) of the 2013 firms were among those registered in the 2008 study. The remaining 73% percent of firms are “new” firms, indicating a sizeable mortality rate for the 2008 group. Indeed, the failure of 75 of the original 109 firms represents a mortality rate of 69%. The 2013 survey had a completed sample size of 60 (firms which were registered software firms). The main results and some comparisons between the two studies are described here.

On the size distribution of the firms interviewed an increase in the percentage of micro and large firms relative to 2008 was observed. There was a decrease of small and medium enterprises (SMEs). Increased micro-sized firms can be considered consistent with the high number of newer businesses on record 2013. Moreover, the increase in the percentage of large firms could be due to growth in sales reported by 85% of the companies investigated.

With regard to software product exportation, 62% reported making no exports. However, there was an increase in the percentage of firms (57% to 65%) with more than five years of exporting experience. Among the companies that have not exported, approximately 50% reported plans to export in the near future.

Regarding firm ownership, the survey of 2013 found in 95% of the cases, the principal owners were men. Of the owners, 68% reported their backgrounds as being IT professionals, 30% were professionals in other areas and 2% were entrepreneurs with not specific academic credentials.

In relation to target market, 48% of respondents indicated the majority of their customers were large firms. In second place were MSME (micro, small and medium enterprises), representing 18% of customers, while 13% indicated their primary customers were governmental entities. A small minority (5%) indicated their main markets were overseas (export) customers.

Today the market is expanding to the applications' market (called apps) given the increase in the number of mobile phones and other portable communications equipment in the country. Of the respondents,, 57% are working on mobile apps while 23% reported plans to do so.

On the other hand, there were surprising views expressed in relation alliances, especially as regards international, strategic alliances. There was a noted decrease in the optimism that was previously reported with regard to such cooperative alliances. Among the findings:

- Although most respondents were positive with respect to trends in the industry, the percentage of those who believe that the trend is towards growth decreased from 88.6% to 75% between the two surveys.
- In the 2008 survey, 71% gave high importance to establishment of international strategic alliances. That percentage dropped to 58% in 2013.
- The percentage of companies that gave high importance to quality certifications also showed a decrease from 54% to 33%.
- There is a relatively small but significant increase (from 3% to 8%) of respondents who consider the level of cooperation within the same industry is high.

These latter results are probably related to the financial crises that have occurred in the international arena in recent years and with the highest percentage of businesses in the sector. Perceptions regarding government support for Costa Rica software companies, 43% perceived low support in research and development (R & D). Regarding financial services, 40% felt that the support is low and 52% considered such support to be average.

Telecommunications reported similar assessments, with high percentages of average support (58% and 55% respectively). Technology respondents held a more favorable perception: 57% qualified support as average and 40% as high support.

CONCLUSIONS

The country has challenges related to supporting and encouraging the software, information and communications technology sectors, as investment remains very low. The opportunity to seek additional resources through venture capitalists is seen as a deterrent.

Four in ten entrepreneurs consider support from Costa Rica to be lacking, especially as it regards funding for research, development and financial services development. At the same time, eight out of ten consider support

for telecommunications and the availability of human resources to support telecommunications substantially improved compared to 2008. In general, perceptions that technology has improved in the country are widespread.

The Costa Rican ICT business sector has adjusted its strategies to take advantage of new opportunities in the environment. For example, 57% of companies are already producing apps and 23% plan to do so, given the expanding market for applications and the increase in the number of mobile phones and other portable equipment.

This sector shows significant instability as 73% of registered firms are comprised of new firms, while the percentage of older firms shrink. On the other hand, the growth rate of 16.5% is encouraging. There is an increase the number of large enterprises and microenterprises, and surprisingly, the number of small and medium business enterprises in the sector is decreasing. Moreover, it is a growing sector in market with 85% of respondents reporting an increase in sales.

Regarding the export of software, 62% do not export. But, there's an increase in the percentage of firms with more than five years of exporting experience. Of the companies reporting they do not export, one-half plan to do so in the future. Ostensibly, they recognize such an effort may pay dividends and allow them to become sustainable enterprises.

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