Institution: University of Manchester

Unit of Assessment: 19 (Business and Management Studies)

Title of case study: Impact on Software Exports Policymaking in Developing Countries : The Development Of The Software Exports Success Model

1. Summary of the impact

Research by Nicholson at Manchester Business School has transformed the software export sector in several developing and transitional countries. The research comprised the identification of a comprehensive Software Export Success Framework that characterises the dimensions of strategic planning required for cluster development and software exports entry. The framework has been adopted directly by policymakers in Egypt and Costa Rica and has become embedded into the National Strategy for Software Exports in both countries, radically transforming their IT and software export industries.

2. Underpinning research

The impacts reported here flow from a programme of research undertaken at the University of Manchester from the mid-1990s onwards. Nicholson has worked at the University of Manchester as a Lecturer and Senior Lecturer from 1999-date. The aim of the research was to understand the management of the process of software outsourcing from Western European and North American clients to Indian vendors.

This included Nicholson's PhD which is focussed on a longitudinal analysis of the case study of a major outsourcing project between UK client and Indian vendor "Mastek" based in Bombay. This involved extensive fieldwork in India and the UK focussing on the challenges to management processes involved in UK – India outsourcing. This inquiry included the contextual analysis of the role of supporting institutions that have facilitated the growth of Mastek as part of the Indian software services industry.

Subsequent collaborative work with Indian academics focussed on another longitudinal case of a small software firm that opened a subsidiary in Bangalore. This involved extensive fieldwork in India and UK during Nicholson's Bangalore based sabbatical. This research focussed on the management challenges for foreign direct investment into India. In parallel, the India collaborators were engaging in similar longitudinal studies which resulted in a published book bringing together the detailed cases of the management of outsourcing arrangements between clients in North America, Korea and Japan, outsourcing to India based vendors.

This research provided an evidence base of the practices and processes that the successful Indian software exporting clusters were adopting and the supporting Institutions that had facilitated their growth.

Independently and in parallel, Professor Richard Heeks of the University of Manchester (Lecturer, Senior Lecturer, Professor 1991-2004) since the early 1990s, had been conducting critical analysis of the development of India's software industry and the impact of the policy of liberalisation in the areas of trade, state intervention and foreign investment. Heeks was also pursuing a broader research programme into Technology Policy Making and Software Strategies In Developing Countries. This work resulted in a series of publications on the institutions that supported growth in software export clusters.

The pooling of research findings led to joint publications and the specific development of the Software Export Success Model [3,5]. These co-authored papers addressed the detailed dynamics of software exports development in India, the leading country during this period of intense growth while the authors were engaged in their field work and extended the analysis to comparison with other software exporting nations such as China and Russia. The research findings showed that the main success factors in software export could be categorised under 5 headings:

- Demand
- National Vision and Strategy
- International Linkages

- Software Industry Characteristics
- Supply factors and Infrastructure

From qualitative analysis of these factors a Software Export Success Model was determined that demonstrated the demand drivers, supply drivers and enablers that contribute towards software export growth. The model was then applied to the emerging Software export markets of China and Russia to test its value as a template to guide a comparative analysis of sectoral strengths and weaknesses in second-tier export followers. The model was then further tested and improved during a project in Iran.

Prior to the publication of the journal article, a working paper [5] was available for download from the University of Manchester web pages. This widely available working paper formed the initial point of interest from policymakers in Iran, Costa Rica and Egypt. This model described in the working paper was applied and improved during fieldwork in Iran [4] leading to the published version of the model [3].

3. References to the research

1. Nicholson, B and Sahay, S. (2009a) Deinstitutionalization in the context of software exports policymaking in Costa Rica. *Journal of Information Technology*. 24(4): p332-342 DOI: 10.1057/jit.2009.18
2. Nicholson, B and Sahay, S (2008) Human resource development policy in the context of software exports: case evidence from Costa Rica. *Progress in Development Studies* 8 p163-176. DOI: 10.1177/146499340700800202
3. Heeks, R. and Nicholson, B. (2004) Software Export Success Factors and Strategies in 'Follower' Nations *Competition and Change* 8 (3) p267-303 - Copy available on request
4. Nicholson, B. and Sahay, S. (2003) Building Iran's software industry an assessment of plans and prospects *Journal of Information Systems in Developing Countries* 13. p1-19.
5. Heeks R and Nicholson B (2002) Software Export Success Factors and Strategies in Developing and Transitional Economies *Development Informatics Working Paper* – Copy available on request

Evidence of the quality of the key references includes *Human resource development policy in the context of software exports: case evidence from Costa Rica* [2] cited by 16 in Google Scholar. *Software Export Success Factors and Strategies in 'Follower' Nations* [3] cited by 41 in Google Scholar and *Software Export Success Factors and Strategies in Developing and Transitional Economies* [5] cited by 3 in Google Scholar. [1-4] are all published in peer reviewed journals.

4. Details of the impact

Pathways to Impact

After the publication of the initial working paper [5] had attracted the interest of several developing countries, the model [3] was used by Nicholson in an extensive action research project reporting directly to the Costa Rican Minister for Science and Technology and funded by the Inter American Development Bank [1,2]. This involved Nicholson leading and working alongside a team of consultants to i) engage in a process of data collection from key stakeholders; ii) benchmark the existing software export cluster against other international clusters, iii) advise and set up a series of task force groups comprised of the relevant stakeholders in the supporting institutions such as the marketing exports promotion agency, banking and finance, the industry representation and education institutions that support the sector development. This analysis and process resulted in the Costa Rican National Strategy for Software Exports.

The software export success framework was subsequently adopted by Egypt's Information Technology Industry Development Agency (ITIDA) policymakers to design the Egyptian plan for software exports promotion. ITIDA actively pursues two broad goals: building the capacities of Egypt's local information and communications technology (ICT) industry and attracting foreign direct investments to boost the ICT sector locally and globally. As a government entity, ITIDA works in collaboration with the Ministry of Communications and Information Technology (MCIT) and the private sector to support the quality of IT services and applications.

Reach and Significance

Costa Rica

The Costa Rican project involved the use of the software exports success framework [3,5] as the basis for the disciplined planning and implementation of software exports policymaking and strategy [A]. The resulting documents and implementation processes involving a series of task force groups led to the creation of the Costa Rican national strategy for software exports. The strategy has had the following effects and has continued to be an important feature of the Costa Rican ITD industry:

1. The Chamber of Software Producers in Costa Rica evolved to the Chamber of Information and Communication Technologies (CAMTIC) that now is the umbrella for a wider range of IT and business process outsourcing companies (collectively known as the "digital industry"). This is significant because the cluster in 2003 had limited prospects as it involved only software producers, mostly focused on the local market. In his statement [A] the former Director of the Inter American Development Bank who funded the Costa Rican Prosoftware programme confirms; "*Widening the Chamber scope to include other actors was the key strategic direction advised by Dr Nicholson critical to the success of the sector. An example of the continuing positive effect post 2008 is shown in December 2012 when CINDE (Costa Rican organisation in charge of attracting foreign investment) instituted a national programme "CENTRAL GATE" to create a cluster for the whole Digital industry in Costa Rica, focused initially on selling their services in North America. The digital industry now includes contact centres, back office support, digital media, software development and related services. All are Costa Rican companies and CINDE will promote the firms as an organized cluster. This is a step which was advised as appropriate by Dr Nicholson as a component of an organized digital sector with most of the companies belonging to CAMTIC."* CAMTIC figures show that between 2003 and 2008 the digital sector grew from 150 to 805 companies in Costa Rica and exports represents 10.6% of the national GDP [A]. According to the A.T. Kearney Global Services Location Index, in 2011 Costa Rica was ranked in 19th place. Using the same metrics in 2007, Costa Rica was ranked 34th a climb of 15 places in global ranking [D]. According to the former Director, the main impact of Nicholson's analysis has been in, "*consolidating the sector as a more significant contributor of the Costa Rican economy. This has had the effect of more concerted political action that allows the sector representatives in CAMTIC to lobby for changes in legislation and investment such as the recent CINDE initiative".*
2. The second effect is the internationalization of the sector with more companies today "born to export" which represents a major contrast with 2003.
3. The third effect is the maturity of the sector. Today, most of the companies in the digital sector understand that competition is not locally based in Costa Rica and that working together through CAMTIC can be beneficial for the digital sector. "Proximity Costa Rica" is an example of the kind of "born global" firm that has emerged in Costa Rica. It is a consortium of 3 companies, working under one umbrella, sharing costs and benefits.

In general the creation of the national strategy based around the original research undertaken by Nicholson in Manchester has allowed Costa Rica to improve its global competitiveness in the ITC software export market. This has helped the sector grow from an underdeveloped industry into one that is now genuinely competitive on a world stage. Elements of the framework have since been used in training provided to government officials in other Central American countries [C].

Egypt

The impact of Nicholson's research into the key dimensions of software exports planning can be seen in further countries where policy and strategy have been designed using the model. A further example is Egypt where in 2006 a new IT industry national development strategy targeting export growth was announced. This strategy used insights from the original research of Nicholson [5]. This paper is extensively cited in the national strategy documentation [E].

The key factors from Nicholson's research that were implemented during the Egypt strategy plan are detailed below:

1) An elaborate, exhaustive, practical and well-designed check list which was used while defining Egypt's Strengths, Weaknesses, Opportunities and Threats (SWOT) in the targeted export industry segments and markets.
2) A benchmark of the Critical Success Factors (CSF) we needed to examine in Egypt's specific case in order to assess its potential, chances to succeed in achieving the committed objectives of its strategy and those CSF needed to cover in designing more than forty two enablement programs behind the strategy.
3) A well-documented study detailing the features and specifics of the "First-Tier Software Exporters: The '3Is'; India, Ireland and Israel" helping us to learn from the successes achieved by those leading players.

The importance of the software exports success model is acknowledged in a statement [B] from one of the Egyptian policymakers, who at the time was Technology Development Advisor to the Egyptian Minister of Communication & Information Technology and was the lead policymaker responsible for creation of the national strategy document. He writes:

"Development of the Model of Software Export Success and using the model in assessing the performance and potential of other developing and transitional economies namely; Russia, the Philippines and China, provided us with a methodology to examine and confirm Egypt's chances for success, which was also pivotal in ensuring buy-in of the concerned stakeholders and securing the approval of decision makers of Egypt's strategy".

Since the introduction of the strategy in Egypt software exports have risen from $250 million (2005) to £1.1 billion in 2010. An additional 60,000 new direct and 150,000 indirect jobs had been created in the IT sector by the end of 2010 [B]. In addition the attractiveness of Egypt as an offshore location has also improved moving from position 13 on the A.T. Kearney Global Services location index (GSLI) in 2007 to position 4 in 2011 [D].

The success of the strategy is further acknowledged by the policy maker, further demonstrating the value of the model developed by Nicholson on the IT industry in Egypt. *"Egypt's case study as a late entrant to software exports market and its success not only achieving its planned and announced objectives but actually over achieving those objectives is a solid confirmation of the value provided by the study and its intended objectives to help those late entrants' countries."* [B].

5. Sources to corroborate the impact

All sources cross-referenced in section 4.

A) Statement from former Director of the Inter American Development Bank who funded the Costa Rican Prosoftware programme.

B) Statement from former Technology Development Advisor to the Minister of Communication & Information Technology Egypt, a policymaker in Egypt responsible for strategy formulation who utilised the Software Exports Success Framework [3,5] in the software exports planning process at Information Technology Industry Agency (ITIDA)

C) Statement from Consultant at Cap Gemini who used the framework [3,5] in software exports training

D) AT Kearney Global Services Location Index Report (2011)

E) Presentation of the Egyptian "*IT Industry National Development Strategy targeting Export Growth"* citing the model developed by Nicholson and Heeks