

## Book Review

Information Economy Report 2012: The Software Industry and Developing Countries, United Nations Conference on Trade and Development (UNCTAD), New York and Geneva 2012, 126 pp.

This is an excellent report on the state of software industry in developing countries. The report is a comprehensive and systematic analysis of main issues affecting the software industry and is an invaluable reference for governments and the private sector alike, particularly in helping them to come up with cohesive and structured development plans that take cognisance of the role of information economy.

Chapter 1 underlines the growing relevance of software for development and sets the framework for the remaining chapters of the book. Software definitions are captured here. National software systems are explained including national vision, government policies and institutions, ICT (Information and Communications Technology) and business infrastructure, workforce skills, incentives for entrepreneurial efforts and risk taking. Readers will find the segment on enabling factors in the national software system to be relevant and applicable. The segment related to access to ICT infrastructure is rather brief but this is dealt with in subsequent chapters. Chapter 2 looks at market size for software services, employment and the measurement of software performance in the country. Findings suggest that software spending is demand-driven rather than supply determined. To supplement the study, a linkage could have been established between Gross Domestic Product per capita and internet demand as a derived-variable. Unfortunately, there was insufficient discussion on venture capital which is, as acknowledged, remains largely untapped. Perhaps an evaluation on the potential market and some statistics on venture capital would have been helpful to policy makers seeking to understand the impact of strengthening alternative sources of capital.

Chapter 3 discusses selected cases beginning with India and Sri Lanka with their strong export orientation, and four other countries that focus on domestic markets namely, Republic of Korea, Brazil, China and the Russian Federation. India was identified as among the few low-income countries that have succeeded in building significant software capabilities on a large scale. This makes it an important case study. Sri Lanka on the other hand, has made inroads into mobile apps with a strong export bias. The Republic of Korea has one of the largest ICT sectors per unit of GDP and is the fifth largest

exporter of ICT goods in 2010. However, it has been less prominent in terms of software production and exports. An important development has been the creation of a standardised platform for e-government to avoid dependency on any single supplier. It was also to avoid the use of multiple frameworks for the development of applications in different parts of the administration. The nation's e-government frame employs open sourcing, open processes, open outputs and open eco-systems. Other governments can draw from the experience of the Korean government which provides a standardised interface for e-government services, through one-stop services and significantly raised the level of public satisfaction.

Forrester (2012 a,b,c) identifies Brazil as the fastest growing IT market in the world. Government strategies include investing in technology training and supporting of domestic technology-based enterprises. China's domestic market still absorbs about 90% of production, whereby embedded software represents a critical part. The software production in China is intimately linked to the dynamic hardware sector with a stronger focus on software products rather than services. Compared with China and Brazil, the software and IT industry in the Russian Federation is relatively small at US\$9 billion in 2011. Global links are increasingly important. For example, Kaspersky Lab which began to internationalise in 2001 is now among the world's top 100 software vendors. The Skolkovo Innovation Centre is a new project in Moscow established under a separate federal law and now viewed as the Silicon Valley of the Russian Federation supporting creations in ICTs, space, nuclear and other technologies. This chapter basically underlines the crucial role of governments in steering IT development which cannot be solely dependent on market forces. In this regard, this chapter focuses on case studies and provides a valuable analysis on adaptive behaviour of governments in steering software capabilities. The cases are particularly relevant because different countries have charted different software paths. Clearly, government efforts in designing national plans which take account of national diversities are very important in driving the software industrial growth.

Chapter 4 discusses the evolution of free and open software (FOSS) during the past decade and notes how the present pattern is to strengthen the growing reliance on FOSS. Hence, this trend should be seriously considered in any design to reinforce national software. The primary difference between proprietary software and FOSS is that the source code in the latter is freely available. Pros and cons of FOSS are discussed giving the reader a balanced view should governments for example choose between proprietary software or FOSS. The chapter ends with policies supporting open source software. The current trend has various implications including decrease of the market power of proprietary software development.

Chapter 5 highlights the relevance of domestic software capabilities to achieve an inclusive information society. Supportive policies, laws and regulations are needed to catalyse progress in this area. Other stakeholders, meaning donors, the private sector and civil society, should jointly contribute towards this objective. Certain segments of the book are repetitious such as the need for the government to adopt specific policies that enhance learning capacities. What could perhaps enhance the value of this report is specific guidelines on gaps in education policies prevalent in developing countries or a new framework of operations for national institutions that meet the current needs. However, the point is well taken, in that, active government involvement at the early stages of growth is paramount. A good point quoting from Nicholson and Sahay (2009) is that governments should play the role of proactive coordinator rather than seeking to force a top-down approach. Attention is also drawn to the necessity for information from stakeholders on bottlenecks and opportunities in the system. This is especially crucial for ICT and software which is constantly evolving. The report emphasises changing market trends and emerging technology for example, respect for FOSS, mobile apps, cloud computing and web 2.0 technologies.

Key supporting factors are (i) human resources (ii) infrastructure (iii) enabling business environment (iv) legal framework. Countries will also find that the information on main barriers to growth and development of the software and IT industry (Table V.1 page 83) helpful. Policy makers should take note of the reported point that at least half of those surveyed across most countries stipulated a lack of qualified human resource and limited access to venture capital as among the primary barriers to growth. Although less important, other factors such as inadequate protection of intellectual property rights, high rates of piracy and unfavourable business climate should be looked into by the authorities.

Strengthening capabilities of the local software industry and developer community were seen to be achievable via three processes.

1. Creating an enabling business environment
2. Encouraging quality certification
3. Access to finance

On the first point, selected schemes for quality assurance were reviewed, namely the International Standardisation Organisation (ISO), Capability Maturity Model Integration (CMMI), Certification Scheme for IT SMEs (ITMark), Melhoria de Processos Software Brasileiro (MPSbr) and Information Technology Infrastructure Library (ITIL).

In discussing the securing of access to relevant skills, only two methods were reviewed, the first on skills development through the education system and via specialised institutions and the second, on in-house training. A weakness of this report is that it left out spill-over technology and IT skills via FDI. It also omitted the role of grants and government fiscal incentives which could be used in partnership with the education sector to enhance human resources. Fostering software demand is well discussed in the public and private sector as well as promotion of export demand highlighted.

In terms of legal framework, this increasingly important part of the enabling environment is not adequately discussed. Discussion towards the end is somewhat limited with some attention on intellectual property protection, laws related to electronic transactions and the legal environment for electronic payments. The primary objective of protecting intellectual property is to encourage the investment of resources for the introduction of new products to the market. This sustains employment and cultivates indigenous innovations and its commercialisation.

Although proprietary software can create very high profits, it can also stifle competition as local SMEs are prevented from entering the software market, especially if certain software becomes the defacto standard. FOSS uses copyright to maintain and promote its openness, yet, is fully compliant with intellectual property laws. It was noted that in India and Brazil, the stricter enforcement of intellectual property protection reduced software piracy and encouraged offshore software product development.

Three common policy propositions necessitate deliberation. First, software purchased for use for the government or public offices should conform to open data standards and file formats. Secondly, software tailored to specification for use in government and public service should be delivered in full source code. This is especially vital in the case of critical software related to for example, national health data, national security and infrastructure management. Finally, an enhancement of regulatory enforcement of intellectual property rules and the will to handle legal misconduct in a decisive manner are vital. This is particularly challenging for LDCs and low income countries. Overall, the book comes highly recommended.

## References

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