

Americas Conference on Information Systems (AMCIS)

AMCIS 2007 Proceedings

Association for Information Systems

Year 2007

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Economies

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IS/IT IN DEVELOPING AND EMERGING ECONOMIES

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Abstract

In spite of the rapid growth many developing and emerging economies are experiencing, with much of this growth supported by information technology (IT), published research dealing with IT in developing economies is still very limited. The objective of this paper is to direct attention to this apparent gap and provide an overview of the issues related to information systems (IS) and IT specifically in developing and emerging economies. Business and social conditions specific to developing and emerging economies and their potential effects on IS/IT implementations are discussed. After a brief review of papers presented at previous AMCIS conferences, some research areas that seem particularly in need of more attention are identified.

Keywords: Developing country, emerging economy, information technology

What are developing and emerging economies?

The term *developing country* is usually used to refer to a country with a relatively low standard of living, an underdeveloped industrial base and a weak infrastructure. “Developing” is often taken as a euphemism for “poor”, but it also conveys the idea that developing countries are not locked into a state of poverty, but rather are accumulating capital and building-up an industrial and commercial base. These countries are characterized by economies with low per capita income (defined by the World Bank as gross domestic product (GDP) per head below \$9,200), widespread poverty, and low absolute capital formation. Frequently, these factors have detrimental effect on other key statistical measures, such as life expectancy and literacy rate. *Developed economies*, in comparison, are characterized by high standards of living, continuous, self-sustaining economic growth in the high value added sectors and a good infrastructure. The World Bank classifies economies by their gross national income (GNI) per capita (World Bank 2007). Developing economies, with low to middle per capita income, in 2005 represented about 84% of the world population and 22% of the world GDP (World Bank 2007).

The term *emerging market economy* is often attributed to van Agtmael (1984) and describes countries with low to middle per capita income that are pursuing economic development and extensive reform programs to become globally competitive. Simplified, emerging market economies refers to a group of countries that are gradually advancing from the developing into the developed status. Countries with emerging economies may vary considerably by size; thus China and India, both

economic powerhouses because of the size of their economies, are included in this category, together with much smaller countries, such as Greece or Poland.

A special group of emerging economies are the *transition economies*. This term refers specifically to the countries of the former eastern bloc and the countries that resulted from the breakup of the Soviet Union. Within the last 20 years these countries have abandoned communist style central planning systems for free markets. Approximately one third of the world population lives in countries classified as transition economies (Soubotina and Sheram 2007).

Characteristics of developing and emerging economies

Emerging market economies are characterized by being fast growing and in the transition from closed market economies to open market economies, while strengthening accountability. In comparison with the developed countries, the emerging market economies have a lower absolute level of economic development, but they grow faster and their authorities are dedicated to reforms (Arnold and Quelch 1998). Emerging economies share a common statistic of a relatively low, but fast increasing, GDP per capita (Arnold and Quelch 1998). The fast pace of regulatory and economic changes makes the business environment in emerging economies is less predictable (Roztocki and Weistroffer 2004a).

These specific characteristics of emerging economies have a number of economic and social implications. Thus for example, emerging economies usually have a considerable rising middle class population with fast growing personal income, creating a solid domestic demand for new products and services. Often the consumption rate is higher than in developed regions as the relatively affluent population tries to make-up for past lack of opportunity. Regarding the domestic industry, the steadily growing personal income and consumer spending create many new business opportunities, but also draw attention from global competitors seeking to capture a share in the newly opened markets. Subsequent business expansions are logical steps, as many international companies invest globally to compensate for more stagnant consumption in the mature markets of developed countries.

Overall, there are several substantial differences between businesses in emerging markets as compared to firms located in developed countries. Companies in emerging economies have, on average, been operating for a shorter period of time, as they are often new business start-ups or, in the case of transition economies, products of privatization (de Castro and Uhlenbruck 1997). Also, businesses in emerging economies tend to have a lower resource base (Hitt, Dacin, Levitas, Arregle and Borza 2000). Furthermore, in the recent two decades many companies in emerging economies experienced large shifts in their customers and suppliers as the result of political and economic changes.

Information technology in developing and emerging economies

Development requires a modern infrastructure and a shift in emphasis from low value added sectors, such as agriculture and natural resource extraction, to high value added industries. In this context, information technology (IT) is often seen as an enabler and catalyst for success of this shift. For purpose of assessing the progress of IT implementation, local and international institutions seek measures, such as the fraction of the population with individual access to computers and the Internet.

Yet, while this measure makes at least some sense in the developed countries, where individual ownership of computers is widespread among the population, it makes little sense in developing countries. For instance, although individual possession of information and communications technologies (ICT) is modest, a remarkable number of people obtain access to the Internet and telephones through family, friends, and community. Innovative and entrepreneurial initiatives in developing countries provide low-cost telecommunication access to rural communities through, for example, telephone sharing. Adopting phone sharing as a business model, GrameenPhone in Bangladesh sold more than 100,000 mobile phones to “phone ladies” who now rent out airtime at a modest fee (Qureshi, Keen and Kamal 2007). This technology sharing, though done primarily for economical reasons, also provides additional advantages. Many residents in rural areas of developing countries are illiterate and unskilled in the use of modern technology, and sharing provides not only access to the technology itself, but also access to help in the use of the technology. Thus, measuring the so-called digital divide using a single factor such as individual access to computers (Barzilai-Nahon 2006), a valid approach in the developed countries, may be less useful than expected as a measure of progress and development in emerging economies.

Yet, while large scale personal access to technology may not be the immediate concern in developing countries, IT is nevertheless crucial for companies operating in emerging economies. For domestic businesses, IT may help increase competitiveness by compensating for the scarcity of other resources. For international corporations expanding into emerging markets, IT often provides the most vital and effective link to their headquarters located in developed countries.

The global economy

Rising personal income and consumer spending in many developing and emerging economies have greatly increased their importance to the global market. Furthermore, an increasingly large number of companies from emerging economies, making use of their cost advantages and their ability to effectively operate with limited resources, seek out the international markets to sell their products. In order to succeed in the global market, contenders from emerging economies often follow different strategies than the incumbent market participants from developed regions, which, in turn often dictate different forms of IT implementations. Overall, the rapidly “flattening” of the world (Friedman 2005) due to IT facilitated globalization calls for academic attention to these increasingly important developing and emerging economies.

Research on IT/IS in developing and emerging economies

Despite of the previous discussed trend, the mainstream IT research continues to concentrate on countries with highly developed economies. Consequently, only little research has been reported in the major IT journals related to the topic of developing and emerging economies. Inadequate resources to support research activities in many developing and emerging economies may be one explanation for this (Roztocki, Pick and Navarrete 2004). For example, the high demand for managers, driven by fast economic growth, may result in universities to focus more on teaching rather than on research activities, and to allocate resources accordingly. As a result, universities in developing and emerging economies may implement compensation and promotion rules that promote teaching efficiency over scholarly productivity.

It is also possible that this scarcity and lack of visibility of high-quality research in the field of IT could be attributed to the history of these countries. For example, in many transition economies, most research efforts were sponsored and controlled by government administration and primarily focused upon other fields, such as physics and chemistry (Arogyaswamy and Koziol 2005). In addition to the insufficiency in institutional support, many researchers in developing and emerging economies may lack the history and experience of publishing in international journals.

At times, this over-focus on IT issues in developed countries, and under-focus of IT in developing countries, may negatively impact research in the IT discipline as a whole, as paradigms developed in the context of the developed world may hamper appropriate explanations of phenomena from developing and emerging regions. In the long term, this too narrow focus of research may also negatively affect the economies in developed countries, as their revenues increasingly depend on customers living and working in developing and emerging economies.

Previous papers on IT/IS in developing and emerging economies at AMCIS

Mini-tracks related to IT/IS in emerging economies have been part of AMCIS since 2004, while the Special Interest Group on IS in Developing Countries (SIGISDC) mini-track was only introduced at AMCIS in 2006. A total of 14 research papers have been published in these mini-tracks through 2006, with a combined authorship of 31 researchers. These papers include research on the negative effects of IT costs, international partnerships, case studies on IT implementations, as well as conceptual frameworks for IT investment decisions. Following is a brief summary of some of the papers presented at previous AMCIS meetings.

One empirical study compared the growth in IT investments across countries with differences in IT infrastructure levels (Bagchi, Putnam and Tang 2004). The World Development Indicators (WDI) published by the World Bank provided the data for this study. One important conclusion of this study is confirmation that emerging economies substantially benefit from decreases in the cost of IT equipment.

Using a case study approach, Ding (2004) investigated the international joint venture formation of companies from developed and emerging economies. This study provides some insight on strategic changes, when formerly state-owned companies engage in partnerships with foreign investors.

A different paper proposed using activity-based costing for evaluating IT investments in emerging economies (Roztocki and Weistroffer 2004b). The method was illustrated by way of a hypothetical company that is considering IT investments as a means to protect its cost advantage. The approach proposed in this paper was expanded in a later study (Roztocki and Weistroffer 2005) in which fuzzy logic and multi-criteria decision making were added to the framework. The resulting evaluation method appears to be especially relevant to companies operating in the vibrant and less predictable business environment typical of many emerging economies. Using this evaluation method, managers should be able to better account for intangible benefits when investing in IT.

Another study investigated the implementation of an ERP system in a medium-size, privately-owned real estate management firm in Portugal (Wenger, Dhillon and Caldeira 2005). This work provides evidence that a proper understanding of power structures is essential to understand and explain the IT implementation process in emerging economies.

A subsequent paper examined the implementation and use of balanced scorecard in a Portuguese organization (Rupino da Cunha and Videira 2006). This case study of an organization upgrading its information system suggests that some popular management tools from developed countries, such as balanced scorecard, work reasonably well in emerging economies without a need of major modification.

A survey conducted among IT practitioners in Poland provided additional insight on IT implementation in emerging economies (Soja 2006). The findings of this study confirmed that limited resources are one of the key challenges with many IT implementations in emerging economies. Specifically the shortage of experts and other human resources are a serious impediment.

Another study proposed a conceptual framework derived from case studies in India (Suri and Hara 2006). It can be expected that this framework will be very useful for designing and implementing IT in rural settings of developing countries.

Using the World Telecommunication Indicator database, provided by the International Telecommunication Union (ITU), a further study examined investments in telecommunication (Negash 2006). The findings of this study suggest that in comparison to developing countries, many emerging economies allocate a higher percentage of their budget to investments in telecommunication. Higher absolute budgets and a high level of infrastructure in developed countries were provided as a possible explanation.

Gunawardena and Brown (2006) studied nine educational-based IT projects in three different developing countries, Laos, Sri Lanka and Vietnam. They argue that the hard approach used in managing the system analysis and design is usually poorly structured and problematic. The Soft Systems Methodology (SSM) was presented as an alternative approach to managing these educational-based IT projects.

In another study, critical success factors (CSFs) for electronic commerce (e-commerce) in nine companies covering various industries operating in Thailand are identified (Laosethakul, Oswald and Boulton 2006). The findings suggest that both the social behavior and national culture, specifically issues pertaining to trust and shopping behavior, were the major influences for the success of e-commerce in Thailand. In addition, the country IT infrastructure also played an important role in the success of its e-commerce development.

Using a survey research method, Johnston, Muganda and Theys (2006) compare priorities of CIOs in South African companies to those in developed countries. The top priorities in South African companies were building a responsive IT infrastructure, IT value management, security and control, service delivery, and improving strategic IS planning. One surprising finding of this study is the lack of interest in e-commerce. Thus, at the time of the survey (i.e. in the summer of 2004), the majority of South African companies seemed to prefer traditional means of distribution, and e-commerce was only slowly gaining in importance.

Based upon an exploratory survey of Jamaican-based organizations, Chevers and Duggan (2006) propose some modifications to the *capability maturity model* (CMM) to better suit the specific needs of developing countries. The main objective of this modification is to increase the tangible returns on investments.

Nasirin, Morar, Birks, Zainuddin, Choo, and Wafa (2006) explore the question of how the determinants of successful IT outsourcing in developed countries in North America and Europe can be generalized to a Malaysian context. They argue that if the focus of outsourcing is primarily one of cost cutting, IT outsourcing decision-makers and managers in Malaysia cannot assume that successful outsourcing determinants are of any significance to them. The findings show that Malaysian decision-makers and managers can take some comfort in that many lessons learned on outsourcing can be generalized to their context.

Insights from previous AMCIS mini-tracks and call for research

The review of papers presented at previous AMCIS conferences provides several important insights and reveals several potential research opportunities.

First observation is that the most common research methodology used in these papers is a case studies approach. A second observation is that most empirical investigations at the country level made use of the World Bank database or World Telecommunication Indicator database. Only four studies used surveys as the data collection method.

A third observation is that many papers seem to not be sufficiently placed within the context of developing and emerging economies. The relationship of the promulgated research to the specific characteristics of developing and emerging economies which substantially affect business operations of local companies and their use of IT are not always discussed. It

appears that often authors assume that as long as the research is conducted in or about a developing country, there is no need to explain its relevance to developing or emerging economies.

A fourth observation is that the literature citations tend to focus on the mainstream IT research and do not include many references related to developing and emerging economies. In addition, country or region specific IT implementations are rarely referenced.

A fifth observation is that some authors tend to present a stand alone analysis without adequately comparing their results to similar contexts in developing and developed countries. Thus, often not much explanation is given how the results of a particular study may be generalized and applied to situations or organizations in other countries.

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