

FOREWORD: SPECIAL ISSUE ON INFORMATION SYSTEMS IN DEVELOPING COUNTRIES

By: **Geoff Walsham**
University of Cambridge
United Kingdom
Senior Editor, Special Issue

Daniel Robey
Georgia State University
U.S.A.
Senior Editor, Special Issue

Sundeep Sahay
University of Oslo
Norway
Senior Editor, Special Issue

There was at one time some debate as to whether information and communication technologies (ICTs) were relevant to the developing countries, but this debate has been resolved with a clear “yes” answer. The question has now become not whether, but how ICTs can benefit development. ICTs have high potential value across both public and private enterprises; and at multiple levels, for example from software businesses in urban areas to health delivery in rural villages. The application of ICTs to development goals has not always succeeded to date, and indeed there are many examples of partial or complete failure (e.g., Avgerou and Walsham 2000). One particular issue concerns the need to bridge the so-called “digital divide” between those people with the ability to access and use technologies effectively, and those without. The challenge remains to tackle such difficulties and to resolve them.

Introduction

The developing countries account for the majority of the world’s population, and are important for this reason alone. In addition, developing countries contain millions of people who lack access to resources such as clean water, adequate housing, and education for satisfying basic human needs. Moreover, many people in developing countries lack the freedom to make choices in their own lives (Sen 1999). These conditions present a moral issue with which we should all be concerned. A further reason to take seriously the “majority world,” from a business and policy perspective, is that the world is becoming increasingly interconnected in economic, social, and cultural terms. Whatever view one takes of trends toward globalization, global business, or global outsourcing, there is agreement that these present important issues and problems, even if one lives in the richer countries.

Despite the importance of the topic area of information systems in developing countries, the literature to date is relatively sparse. For example, few papers have been published in premier IS journals such as *MIS Quarterly* and *Information Systems Research*. However, there are signs that this is changing. There are now specialist journals devoted to the topic (e.g., *IT for Development*) and some special issues of mainstream journals have focused on the area (e.g., *The Information Society*, Volume 18, Number 2, 2002). An IFIP working group (9.4) on IS in developing countries was established in 1988 and has produced a number of volumes of conference proceedings (e.g., Krishna and Madon 2003). IFIP working group 9.4 recently held a joint conference with IFIP working group 8.2 with the title “Organizational IS in the Context of Globalization” (Korpela et al. 2003). These activities provide further indication of a coming together of IS researchers whose interests span both developed and developing countries.

This is a particularly good time, therefore, for *MIS Quarterly* to support the increasingly important research area of IS in developing countries by publishing a special issue of exemplary papers devoted to the topic. We hope that this will stimulate an increase of work in the area, and will provide models for how such research should be designed, conducted, and written. In addition to contributing to the field of IS as a whole, good research on IS in developing countries can also learn from and contribute to related research fields such as development studies and topics such as globalization.

The remainder of this introductory paper is structured as follows. In the following section, we provide a brief review of some recent studies of IS in developing countries. This review provides a starting point for *MIS Quarterly* readers interested in the topic and wishing to read in greater depth. We then introduce the four papers in the special issue and summarize briefly how each relates to and extends the existing literature; we also offer broad conclusions based on the group of papers as a whole. Next, we provide suggestions for future research in this area. Finally, we reflect on the process of the special issue with a view toward encouraging and guiding potential future authors of papers on IS in developing countries.

Prior Research on IS in Developing Countries

This section aims to provide the reader with a review of selected prior research on IS in developing countries, with a particular emphasis on material published since 2000. No attempt is made here to be comprehensive. We rely primarily upon Walsham and Sahay's (2006) classification of the literature into four categories: broad issues linking ICTs and development, facilitating cross-cultural working, local adaptation and cultivation of IS, and focusing on particular marginalized groups. These categories are not mutually exclusive and reflect major issues that have motivated research investigations to date.

Broad Issues of the Link Between ICTs and Development

Literature in this category deals with the contribution of ICTs to development, taking a rather wide perspective of a particular technology or a whole country. In some cases, the meaning of the term *development* is itself discussed. For example, Madon (2000) examined the use of the Internet in

sectors such as health and education, and in domains such as economic productivity and sustainable development. She drew from the development studies literature to define these latter concepts. She derived implications for government intervention, including the important role of intermediary institutions in linking local and global conditions.

Avgerou (2003) critiqued the discourse arguing for a simple link between ICTs and development, as advanced by some influential international development organizations. According to their argument, more investment in ICT and other technologies will produce development through the operation of standard market mechanisms. Avgerou argued that non-market institutions such as government organizations play a crucial role in both preventing and correcting market failure. She concluded that the dynamics of the link between ICTs and development are complex, and that effective action in this area involves collaboration between industry, government, and international organizations.

Silva and Figueroa (2002) discussed how to promote the improved use of ICTs in the context of a specific country, namely Chile. They drew from institutional theory, particularly adaptations of the theory relevant to the IS field (King et al. 1994), to develop a framework for understanding the role of specific institutional players. These players include private sector companies, but also government authorities and other agencies such as trade industry associations and educational bodies. Silva and Figueroa also drew on the critical development theorist Escobar (1995) to discuss the meaning of the term development, placing greater emphasis on local realities such as indigenous sources of knowledge, power structures, and local discourses of progress. The authors suggest ways in which their institutional framework can be applied in the formulation and evaluation of national ICT policies.

Sayed and Westrup (2003) also wrote about a particular country, namely Egypt, but looked at the role of a specific ICT, enterprise resource planning systems, in bringing together global networks. Their case study focused on global organizations, local companies, government, and aid organizations. They showed how heterogeneous networks of human and nonhuman elements are brought together in a specific global/local combination, linked, for example, to particular national plans for development.

Summary: Taken together, studies in this group raise issues concerning the meaning of development and the links between ICTs and development defined in different ways. The studies often focus on particular countries, allowing an in-depth examination of institutional conditions affecting both

public and privately sponsored efforts to connect ICT with development goals. As a group, the studies do not offer definitive conclusions regarding the relationship between ICTs and development. Nonetheless, they offer valuable lessons by suggesting that future research needs to examine the influence of, and interactions among, a wide range of institutional actors including industry, government, and international organizations. The studies in this group also draw attention to the need to be specific about the particular aspects of development being investigated.

Facilitating Cross-Cultural Working

In contrast to the rather diverse set of papers discussed above, the second category of prior research on IS in developing countries deals with the specific issue of cross-cultural working. For example, Aman and Nicholson (2003) drew data from Malaysia in discussing the growing phenomenon of offshore development, and the ensuing problems of people from different countries and cultures working together. They emphasized the specific difficulty in remote communication when working across cultures. They generated a model for sensitizing collaborators in cross-cultural offshore development projects to issues and problems that may need to be handled. Walsham (2002) also dealt with cross-cultural issues in software production and use, drawing on secondary data from two case studies, including that of a joint Jamaican/Indian software team. Walsham's model of the cross-cultural processes involved drew mainly from structuration theory.

Adam and Myers (2003) took a critical stance on one aspect of cross-cultural working, namely that a software package may impose its own logic when transferred across cultural contexts. Using a case study of the Maldives Customs Service, they addressed the challenge of culturally inappropriate impositions of IS. They related their findings to theories of neo- and post-colonialism. Shoib and Nandhakumar (2003), in something of a contrast, used two case studies to argue that multiple forms of rationality exist in any context and that national culture is only one aspect of actors' sense-making activities. They concluded that we need to unpack the notion of culture rather than seeing it as a fixed entity.

Liu and Westrup (2003) also opposed the view of culture as static, drawing from anthropology to support their arguments. They examined a case study of coordination and control between the United Kingdom and China in a multinational corporation. Although technologies such as e-mail enable the stretching of time and distance, there is no actual "death of distance" because locality reasserts itself in opposition to attempts to control tightly from a distance. Liu and Westrup

argue that ICT-enabled coordination is only effective when linked with other approaches such as the use of expatriates and face-to-face contacts.

Summary: Studies in this group emphasize the crucial importance of ICTs in cross-cultural working in the contemporary world. However, they also warn about some of the difficulties of remote working across cultures and the potential dangers of the imposition of culturally inappropriate technologies. Some of this literature also critiques the notion of culture itself, arguing that it should not be regarded as fixed, and that it is only one element in actors' sense-making processes. Further research is needed in this domain to better understand notions of culture, and to investigate the role of ICTs in cross-cultural working in a wider variety of regional and national contexts.

Local Adaptation and Cultivation of IS

Local adaptation and cultivation of IS in new contexts are themes addressed by the third group of literature reviewed by Walsham and Sahay. Although cultural differences between two groups may not be present as clearly in these studies as in the previous group, bringing technology to a new local context implicitly involves cultural transfer and mutual learning. For example, Bada (2002) described a longitudinal case study of radical organizational change related to the computerization and networking of branches in the Nigerian banking sector. He critiqued globalization theorists who argue that cultural homogeneity is becoming the norm, and instead emphasized the need to understand and value local practices.

Macome (2003) made similar arguments to those above, drawing from a case study of the implementation of an invoice system in the Mozambique Electricity Company. She concluded that the local context was crucial in the implementation process, and that it was essential to involve local stakeholders in the entire process. Korpela et al. (2000) argued the need for systems developers to use approaches that are appropriate for the severely constrained conditions of most of black Africa, and in tune with local cultural characteristics. They described their work on "made-in-Nigeria" systems development methodologies to help address this goal.

D'Mello (2003) was also concerned with local adaptation related to new ICTs, but in her case she addressed the adaptation of people in the context of global software outsourcing. She argued that adaptation has produced a new breed of knowledge workers in the software industry in countries such as India from where she drew her field data. These workers

straddle both global and local experience of events, creating tensions of identity, for example between family orientation and individualism. She summarized her perspective through the title of “Thinking Local, Acting Global” in an ironic twist to the normal cliché.

Summary: This body of literature opposes the naïve idea that globalization is synonymous with cultural homogeneity and reasserts the crucial importance of understanding and valuing locally meaningful practices. Studies in this group typically focus on detailed descriptions of local worlds as perceived by stakeholder groups such as users and systems developers. Even global players, such as workers in the software outsourcing industry in developing countries, struggle to reconcile their global work identities and roles against their local experiences and identities. The vast heterogeneity of the contexts within which ICTs are being applied in developing countries provides a fertile field for future research in this vein.

Focusing on Particular Marginalized Groups

Although software professionals in India may struggle to come to terms with the newly globalized but still local world, they are not socially or economically marginalized as participants in contemporary society. In contrast, many people and groups are on the wrong side of the digital divide and lack the means to overcome their marginalized status. It is increasingly recognized that the digital divide is not simply a matter of unavailability of ICTs for relatively disadvantaged groups, but that it is also affected by the social, political, institutional, and cultural contexts that shape people’s access to technologies and their ability to use them effectively. Warschauer (2003) illustrated this broader position in a case study of the use of IT in the education sector in Egypt. He argued that the inequality which exists is primarily social, rather than digital, and cannot be overcome merely through the provision of equipment.

Mosse and Sahay (2003) also discussed the potential of ICTs to help people. The focus in their case was the role of computer-based health information systems in poor districts in Mozambique, one of the poorest countries in the world. Using a term drawn from Castells (1996, 2000), they argued for the creation of “counter-networks” to the existing dominant networks of human and nonhuman actors operating within deep-rooted socio-cultural structures. Such counter-networks are aimed to actively involve relatively marginalized people such as low-level health workers, who are normally excluded from existing networks of power and influence, and to connect new IS initiatives to their existing communication practices.

A rather different marginalized group was chosen by Okunoye and Karsten (2003), who were concerned with the challenge of providing good access to knowledge sources, such as the Internet, for researchers working in regions such as sub-Saharan Africa. They discussed in detail the specific use of technologies such as e-mail, databases, and telecommunications in six African countries. The authors used a simple knowledge management framework, involving knowledge creation, application, and storage, to generate implications for future practice. Although sub-Saharan researchers would not ordinarily be considered to be poor in material terms in the context of their own countries, they can be professionally marginalized from mainstream research activities and on-line research communities. Their marginalized status also restricts their ability to generate research findings relevant to the social and economic conditions of their native countries.

Summary: This fourth group of research studies focuses on relatively marginalized groups within the developing countries and the potential role of ICTs to support their development. It is clear from this body of literature that problems created by the digital divide cannot simply be reversed by providing technologies to marginalized groups. Rather shifts in social, political, and cultural contexts are also required. These latter shifts are considerably more difficult to achieve than technological change, not least because of the implicit or explicit resistance of powerful, non-marginalized groups. This conclusion links back to the start of our literature review, where we acknowledged the need for research on institutional change in order to understand the links between ICTs and various forms of development.

Papers in the Special Issue

We turn now to the four papers accepted for the Special Issue. In each case, we provide a brief synopsis of the paper, together with comments on the linkage and contribution of the paper to the literature discussed above. Leiser Silva and Rudy Hirschheim (“Fighting Against Windmills: Strategic Information Systems and Organizational Deep Structures”) investigate the implementation of strategic information systems (SIS) in a developing country context. The empirical basis for their paper is a two-year longitudinal case study of the attempted implementation of a hospital information system by the Guatemalan Ministry of Health. Silva and Hirschheim use punctuated equilibrium theory, with its concept of deep structure, to analyze their case. They conclude that SIS can fail to become institutionalized in a developing country context despite adequate planning, strong leadership, and knowledgeable IS professionals, all key factors identified in implemen-

tation research conducted in developed countries. Despite the presence of these factors, SIS implementation may directly oppose the prevailing organizational deep structure in a developing country. Silva and Hirschheim identify elements of this deep structure as including core values and beliefs, political time, the distribution of power, formal organizational structure, and control systems. The windmills of the title refer to Don Quixote's gallant yet hopeless effort to defeat solid and unmovable windmills, which he mistakenly thought were giants.

Relating Silva and Hirschheim's paper to aspects of the literature review above, the notion of development being pursued is that IS can in principle provide a more efficient and effective health system for the people of Guatemala by increasing transparency and reducing corruption. The case study also exemplifies issues of local adaptation and cultivation of IS. Hospital information systems of the type described in the Guatemalan case are common around the world, but the specific features of the local context are crucial in how and whether the IS can be successfully implemented. Silva and Hirschheim provide a theoretical lens to enable us to better understand these processes of local SIS implementation, namely that of punctuated equilibrium and deep structure. It is worth noting that their theoretical approach could also be applied in a developed country context, providing a good example of how research on IS in developing countries might contribute to the IS field as a whole.

Satish Puri ("Integrating Scientific with Indigenous Knowledge: Constructing Knowledge Alliances for Land Management in India") looks at the integration of different forms of knowledge that can contribute to improvement in the management of land use in rural India. Scientific knowledge is captured through approaches such as GIS (geographical information systems) but this needs to be integrated with the detailed local knowledge of farmers and others operating in a specific context with which they are uniquely familiar. Puri describes a detailed case study of how knowledge integration was achieved successfully in the district of Anantpur in the Indian state of Andhra Pradesh. He analyzes the case through an original theoretical lens based on the literatures on communities of practice, boundary objects, and participation. Puri concludes that the effective changes, which were implemented in the case study, came about as a result of redefined relationships between scientists and local community members, and the consequent restructuring of their institutional framework.

Puri's paper focuses on rural farmers, a group that is often marginalized despite its great importance in developing countries as a whole. The living conditions of this group, and

development goals in general, are enhanced through better land management and utilization. But the case study also resonates with Sen's concern with increasing the freedom of rural farmers to participate in processes that deeply affect their lives. Like Silva and Hirschheim's paper, Puri's research is also a contribution to understanding the local adaptation and cultivation of IS, but the challenge in this case concerns the utilization of local knowledge to complement the scientific knowledge captured in systems such as GIS. Although the paper's theoretical contributions are aimed at research on developing countries, the conceptual development around boundary objects, and their linkage to communities of practice and participation, has potentially wider application.

Jørn Braa and his colleagues ("Developing Health Information Systems in Developing Countries: The Flexible Standards Strategy") discuss approaches to the development of standards for health information systems in developing countries. Their paper is one output from the ambitious and long-term action research program known as HISP (the Health Information Systems Programme), which aims to make a significant contribution to the development of improved health information systems, and thus to health, in the developing countries as a whole. In their paper in the special issue, they argue that standards for HIS should be flexible enough to be adaptable to different contexts and countries, and to changing circumstances. Their action-research study uses data from a variety of countries over a period of more than 10 years, but with detailed emphasis on South Africa (where their research program started), Ethiopia, and Thailand. They use a theoretical basis of complexity science and, in particular, use concepts such as attractors from complex adaptive systems theory. They conclude that well-defined and simple flexible standards can function as attractors, and that strategies can be developed in specific contexts that encourage experimentation and heterogeneity to produce locally relevant solutions, while conforming to basic standards. The flexible standards approach disputes the common tendency to design large, integrated HIS that seek to obliterate fragmented local systems, many of which rely upon manual record keeping. Although large consulting companies might benefit from replacing local HIS with integrated systems, Braa et al. argue that flexible standards are more effective in HIS that actually work in developing countries.

Braa et al.'s paper and the wider HISP project provide a particularly interesting contribution to the literature on cross-cultural working in developing countries. The collaboration has been mainly south-south, between developing countries such as South Africa and countries such as Ethiopia and Thailand, in addition to the more traditional north-south collaboration between developed and developing countries, as

Norwegian researchers have also been key players in the project. The relatively novel theoretical basis of complex adaptive systems is applied in the health arena, but the authors note that future work could usefully investigate their potential application in contexts outside of the health sector.

Gianluca Miscione ("Telemedicine in the Upper Amazon: Interplay with Local Health Care Practices") describes an ethnographic study of a telemedicine project in a remote and poor area of Peru. A central focus of the paper is the interplay between the public health care system, and its use of the resources of the telemedicine project, and alternative local healing practices involving herbs, plants, and/or magic. These latter practices are managed by families, neighbors, and local healers. The paper draws from institutional theory to show how the institutionalized behavior of the science-based medical practitioners, traditional healers, and local patients were differently focused and, at times, in conflict. Miscione argues that local people's perceptions of their health and appropriate treatments are embedded in their normal patterns of action, which need to be understood in order to design, implement, and evaluate telemedicine projects.

Miscione's paper is focused on the health needs of marginalized people in remote jungle areas where telemedicine would appear to have high potential. In a fascinating spin on the local adaptation and cultivation of IS, Miscione argues for the need to understand the methods and approaches of traditional medicine in order to integrate science-based approaches such as telemedicine into the daily lives of the target population. We note the similarity between this conclusion and Puri's emphasis on the integration of local knowledge about land management with scientific knowledge supported by GIS. Miscione's paper also sheds light on issues of cross-cultural working. The telemedicine project was designed by a European consortium in cooperation with universities in Lima and the Peruvian Ministry of Health. All of these agencies have different institutionalized structures and practices than the peoples living in the jungles of Peru, and they need to be more aware of the interlinked role of telemedicine with local cultural practices.

Some broad conclusions can be proposed based on the papers in the special issue and the prior literature.

- Each study in the special issue shows that consequences emerge from a complex set of processes over a significant period of time, involving a wide range of actors and institutions.
- IS do not have a simple deterministic impact on development. Like other instances of IS being applied to complex social issues, outcomes are not determined only by

the technology. Social influences are crucially important to the trajectory of any technology-based project.

- The designers and sponsors of the various technology applications (HIS, GIS, SIS, telemedicine) often have overly simple expectations regarding the role of ICTs in development objectives. These naïve expectations often underplay the role of social and institutional conditions in major development projects, leading to unintended consequences and, sometimes, failure.
- The mutual influence between IS and social processes sometimes results in solutions that work relatively well. Examples are the HIS infrastructure case (Braa et al.) and the GIS case (Puri), where the new information systems were successfully integrated with local conditions (existing health information systems and indigenous knowledge). In one case (Miscione), the integration of the telemedicine technology with local practices was not effected, resulting in some unintended consequences for the project. And in one case, we find deep-seated resistance and failure (Silva and Hirschheim).
- The qualitative research methodologies of the papers published in the special issue display their relative advantage over studies using more distant quantitative measures in revealing the processes that bring technological and social aims into relative alignment or not.
- Applying IS to development requires an understanding of local meanings, existing work practices, and institutional contexts, as well as a willingness to engage with the dynamics of socio-technical change over time.

Future Research Directions

As we indicated at the start of our paper, the literature on IS in developing countries is relatively sparse when related to the breadth and importance of the area. So our first comment on future research is simply that we would like to see the rapid expansion of research on IS in developing countries. In this section, we provide some possible dimensions for expanding future work, discuss theoretical and methodological issues, and identify other literatures to which better connection could be made in research on IS in developing countries.

Dimensions for Expansion

First, future research is needed to provide a wider *geographical spread*. For example, IS in China is very poorly

represented in the English language literature, despite the increasing global importance of that country and its vast population. Western media coverage of China's economic growth often masks the relatively undeveloped living conditions of the great majority of Chinese. IS researchers based in Hong Kong, Singapore, and Taiwan may be able to capitalize on their geographic location to pursue research on IS and development within mainland China.

With respect to the *type of organizations* being studied, both public and private sector organizations remain important, but it would also be good to see more research on the role of non-governmental organizations (NGOs). These include well-known international organizations such as the International Red Cross and Oxfam, but also many smaller and sometimes indigenous NGOs, which often function as important intermediaries in IS-related development. In addition, more research is needed on the role of major international aid organizations, such as the World Bank, in IS projects.

A third dimension of expansion concerns the *level of analysis*. Levels of analysis typically progress through individuals, groups, organizations, industry sectors, societies, and international organizations (Walsham 2001). All of these are represented to some extent in the existing literature on IS in developing countries, but none of the levels is as thoroughly researched as it should be. In addition, the progression to higher, aggregate levels of analysis tends to exclude communities as a relevant level. Much development effort takes place in communities, as illustrated by Puri's paper in this special issue. In addition to rural communities of the type that Puri studied in India, urban communities are also important. For example, communities in poor areas of cities may be the targets for various digital inclusion projects (Reilly and Gómez 2001). Work at the community level also promises to contribute to an understanding of IS in marginalized groups in developed countries (e.g., Kvasny 2006).

Topics for Future Work

It is impossible in this short paper to provide a detailed preview of potential future research topics, since the scope of such work is very wide indeed. Instead, we will mention a few important areas for future work which have been somewhat neglected to date. For example, while some research has been carried out in key sectors that affect all people in developing countries such as health, public administration, and education, a key problem remains the issue of *scalability*. This relates to how small-scale pilot projects, which are quite common in developing countries, can be rolled out across much wider reaches of entire districts, provinces, or countries (Sahay and Walsham 2006). Scalability also relates to

increasing the variety and significance of services offered over time.

A second topic where future research would be valuable is *in-depth studies of particular technologies*, and the detailed way in which their hardware, software, and system configurations interact with specific aspects of social, economic, and cultural contexts. Although some existing literature on technologies such as GIS exists, a range of other technologies have received relatively little attention. An example is the area of e-government, where the precise way in which technology is configured and introduced for a particular application is often crucial in determining whether the application is successful or not (Krishna and Walsham 2005). A second important technological area for developing countries is that of free/open source software. Most descriptions of open source applications come from studies in Western countries, and little is currently written about approaches that can be effective in developing countries. Countries such as Brazil have devoted considerable effort to this area, but the subtleties of issues such as business models, licensing agreements, and software support are crucial, and IS research could make a valuable contribution here.

Research is also needed on *society-wide critical issues* in developing countries. HIV/AIDS is a prime example. Obviously, medical and pharmaceutical knowledge are crucial in addressing the HIV/AIDS pandemic, yet IS also play an important role. For example, in trying to target antiretroviral drug treatments, accurate patient data and records are needed, something which is often lacking in the poorer countries where the disease has its worst effects. Research is needed to address how best to tackle the informational aspects of HIV/AIDS and how to link these systems with policy processes regarding drug roll-out and education campaigns (Chilundo et al 2004). A variety of stakeholders are involved on the ground, from UNAIDS to small local NGOs, and patients often have to visit different centers for various services. Improved service delivery necessarily involves the integration of disparate IS, a potentially valuable topic for future IS research on HIV/AIDS.

One final area which we would like to mention for future work is that of *gender studies*. It is widely recognized in the development community, including both international aid organizations and local NGOs, that the role of women in developing countries has traditionally been neglected and, indeed, that women are often more disadvantaged than men in terms of access to education, health care, and other important services. This is highly relevant to research on IS in developing countries. For example, do women benefit equally to men from digital inclusion projects such as tele-centers? What is the role of women in various community-

based IS projects, for example in the health area, and how could the women be better supported to carry out a more active role? Gender studies have started to receive some attention in IS research (Adam et al. 2004), but there is little work as yet which addresses the role of women in connection with IS in developing countries.

Theory and Methodology

A relatively wide range of theories have been drawn on in the literature on IS in developing countries to date, and we see examples of this diversity in the papers presented in this special issue. We welcome this *theoretical diversity* which reflects the enormous variety of the topics being studied in terms of research issue, level of analysis, sectoral context, and cultural location. We would suggest, however, that there is a need for more studies to be *explicitly critical*, in the academic sense of that term, and to draw on appropriate critical theories to support research objectives (Howcroft and Trauth 2005; Orlikowski and Baroudi 1991). Research topics in developing countries are usually deeply intertwined with issues of power, politics, donor dependencies, institutional arrangements, and inequities of all sorts. These are precisely the type of issues where critical work can “open up the black box” of accepted ways of doing things as an aid to deeper understanding.

With respect to methodology, much of the current literature on IS in developing countries uses case studies and *broadly interpretive research methods*. This applies to the four papers published in this special issue and, as we discussed briefly earlier, this may relate to the need to examine the detailed relationship between the technology and its social and cultural context, something which is hard to access effectively through quantitative data. However, interpretive studies may utilize quantitative as well as qualitative data, and in addition we see a role for *purely quantitative studies*, perhaps particularly in terms of scoping and measuring some of the broad parameters and context of IS issues in developing country. No such papers appear in the special issue, but we would hope to see examples published in the future.

We would also like to see more *action research* studies. There are surprisingly few reported in the literature on IS in developing countries. Action research would appear to be particularly relevant in contexts where resources are scarce, when it can be argued that outside researchers should not only go away with data for their academic papers, but should also aim to make a contribution in the research setting itself. This is not to say that action research is the only way of influencing the world in a positive way. Ideas are also crucial in changing attitudes, and a relatively theoretical piece of

writing may have large consequences. Nevertheless, for IS in developing countries, it would be desirable to see more action research studies reported in the literature. The paper by Braa and his colleagues in this special issue provides a good illustration of such work.

Connection to Other Literatures

The field of information systems has always drawn on literature from other related fields, for example economics and organization studies. For the subfield of IS in developing countries, these related literatures remain relevant. However, we would like to mention two other literatures of specific relevance, namely those of *anthropology* and *development studies*. The first of these offers valuable methodological and theoretical approaches to the study and understanding of cultures and societies. The paper by Miscione in this special issue is a good example of research which draws heavily on the anthropological tradition.

The development studies literature is, arguably, even more relevant than anthropology to the study of IS in developing countries. We have discussed the importance of definitions of the term development earlier in this paper, and definitions continue to be debated at length in development studies. In addition, many other issues that are of relevance to our field receive significant attention in development studies: community development, good government, the role of women, multinational corporations, etc. However, *the link between our two literatures should not point in only one direction*. Although IS researchers may gain insights from borrowing from the development studies literature, research on IS in developing countries can offer much to development studies because no development area is unaffected by ICTs. In the same way that IS researchers sometimes publish in journals such as *Organization Science* when their findings are relevant to the community of organizational scholars, journals such as *World Development* offer potential outlets for scholars working on IS in developing countries. We would like to see synergies between IS in developing countries and other research fields better developed in the future.

Reflections on the Process of the Special Issue

We end this introductory paper with some reflections on the process of editing the special issue, particularly with a view to making constructive remarks to authors writing papers on IS in developing countries.

First, we were very pleased to have our proposal for the special issue accepted by a leading journal like *MIS Quarterly*, providing a strong signal of the importance of the topic. The massive response to the call for papers produced 84 submissions, exceeding even our most reckless estimate and confirming the journal's faith in the topic as being of high current interest to IS researchers. The geographical spread of authors and author teams was also much wider than the usual sphere of IS research in the English language, which is dominated by North America and Western Europe. We adjusted to the wider spread of authors by choosing reviewers with direct professional experience in developing countries. The most painful part of the process was screening out 59 of the submissions before review. We subsequently moved 25 papers into formal review and, although we are very pleased with the four excellent papers published in the special issue, we were disappointed that only four of 84 papers survived. It is also worth noting that all four papers are in the broadly interpretive/qualitative tradition. This did not reflect any bias on our part and, indeed, several positivist/quantitative papers were in the 25 papers sent out for formal review. However, none of them survived after three rounds of review.

Why did relatively few papers survive to be published in the special issue? Most of the topics addressed in papers were interesting and relevant to the theme of IS in developing countries, so most rejected papers did not fall at this hurdle. We point to three broad reasons why papers were rejected. First, the theory in the paper was not always well-aligned to the empirical data. Most papers had a theoretical approach and an empirical basis but the theory/data link was often unclear to the reviewers and editors, even after one or two attempts at revision. A second major reason for rejection was that the structure and flow of a paper was confusing. Both the reviewers and editors tried to offer advice in this area, but the timetable of the special issue permitted only two major revisions, and some papers still exhibited significant problems after the final round of review. Finally, and often crucially, the specific contribution of papers to the literature was often unclear. This is a minimum but critical requirement of all papers accepted by a journal such as *MIS Quarterly* and was a significant problem in many of the rejected papers.

For those readers of this special issue who aspire to pursue research on IS in developing countries, the field is now open. Leading journals such as *MIS Quarterly* are keen to publish papers in this area that also fully meet the exacting standards of academic research journals. We are convinced that research on IS in developing countries is of great importance, and we would like to see it develop into a major subfield of IS as a whole, with significant synergy with all other types of IS research, and with related fields such as development studies.

We hope that the exemplary papers in this special issue will help to point the way forward to future research efforts that will be simultaneously rigorous and relevant to one of the most pressing concerns of contemporary life.

Acknowledgments

We would like to thank the past and present editors-in-chief of *MIS Quarterly*, Ron Weber and Carol Saunders, for their wholehearted support for this special issue from its inception. We are also grateful to Carol for her detailed input on this introductory paper. We would like to thank the *MISQ* office for their administrative support, and in particular Jennifer Syverson who handled the high volumes of work associated with the issue.

We would also like to thank all the reviewers, too many to mention by name, who responded to our requests for reviews in a professional and timely way. Last, but not least, the special issue could not have happened without the dedicated service of the associate editors. A special thanks to them who are as follows:

- Ritu Agarwal, University of Maryland
- Chrisanthi Avgerou, London School of Economics
- Dorothy Leidner, Baylor University
- Kai Lim, City University of Hong Kong
- Shaila Miranda, University of Oklahoma
- Ramiro Montealegre, University of Colorado
- Eric Monteiro, Norwegian University of Science and Technology
- Michael Myers, University of Auckland
- Ojelanki Ngwenyama, Virginia Commonwealth University
- Leiser Silva, University of Houston
- Lucy Suchman, Lancaster University
- Gert-Jan de Vreede, University of Nebraska at Omaha
- Eleanor Wynn, Oregon Graduate Institute

References

- Adam, A., Howcroft, D., and Richardson, H. "A Decade of Neglect: Reflecting on the Gender and IS Field," *New Technology, Work and Employment* (19:3), 2005, pp. 222-240.
- Adam, M., and Myers, M. "Have You Got Anything to Declare? Neo-colonialism, Information Systems, and the Imposition of Customs and Duties in a Third World Country," in *Organizational Information Systems in the Context of Globalization*, M. Korpela, R. Montealegre, and A. Poulymenakou (eds.), Kluwer Academic Publishers, Boston, 2003, pp. 101-116.
- Aman, A., and Nicholson, B. "The Process of Offshore Development: Preliminary Studies of UK Companies in Malaysia," in *Organizational Information Systems in the Context of Globalization*, M. Korpela, R. Montealegre, and A. Poulymenakou (eds.), Kluwer Academic Publishers, Boston, 2003, pp. 201-216.

- Avgerou, C. "The Link Between ICT and Economic Growth in the Discourse of Development," in *Organizational Information Systems in the Context of Globalization*, M. Korpela, R. Montealegre, and A. Poulymenakou (eds.), Kluwer Academic Publishers, Boston, 2003, pp. 373-386.
- Avgerou, C., and Walsham, G. (Eds.). *Information Technology in Context: Studies from the Perspective of Developing Countries*, Ashgate Publishing, Aldershot, UK, 2000.
- Bada, A. O. "Local Adaptation to Global Trends: A Study of an IT-Based Organizational Change Program in a Nigerian Bank," *The Information Society* (18:2), 2002, pp. 77-86.
- Castells, M. "Globalization in the Network," *Prometheus Journal* (4), 2000, pp. 109-123.
- Castells, M. *The Rise of the Network Society*, Blackwell, Oxford, UK, 1996.
- Chilundo, B., Sahay, S., and Sundby, J. "The Quality of HIV/AIDS Case-Detection and Case-Reporting Systems in Mozambique," *African Journal of AIDS Research* (3:2), 2004, pp. 145-155.
- D'Mello, M. "Thinking Local, Acting Global: An Analysis of Identity Related Issues in a GSO in India," Research in Progress paper presented at the IFIP 9.4/8.2 Joint Conference on Organizational Information Systems in the Context of Globalization, 2003 (available on CD).
- Escobar, A. *Encountering Development: The Making and Unmaking of the Third World*, Princeton University Press, Princeton, NJ, 1995.
- Howcroft, D., and Trauth, E. (Eds.). *Handbook of Critical Information Systems Research: Theory and Application*, Edward Elgar, Cheltenham, UK, 2005.
- King, J. L., Gurbaxani, V., Kraemer, K. L. McFarlan, F. W., Raman, K. S., and Yap, C. S. "Institutional Factors in Information Technology Innovation," *Information Systems Research* (5:2), 1994, pp. 136-169.
- Korpela, M., Montealegre, R., and Poulymenakou, A. (Eds.). *Organizational Information Systems in the Context of Globalization*, Kluwer Academic Publishers, Boston, 2003.
- Korpela, M., Soriyan, H. A., Olufokunbi, K. C., and Mursu, A. "Made-in-Nigeria Systems Development Methodologies: An Action Research Project in the Health Sector," in *Information Technology in Context: Implementing Systems in the Developing World*, C. Avgerou and G. Walsham (eds.), Ashgate Publishing, Aldershot, UK, 2000, pp. 134-152.
- Krishna, S., and Madon, S. (Eds.). *The Digital Challenge: Information Technology in the Development Context*, Ashgate Publishing, Aldershot, UK, 2003.
- Krishna, S., and Walsham, G. "Implementing Public Information Systems in Developing Countries: Learning from a Success Story," *Information Technology for Development* (11:2), 2005, pp. 123-140.
- Kvasny, L. "Cultural (Re)Production of Digital Inequality in a US Community Technology Initiative," *Information, Communication & Society* (9:2), 2006, pp. 160-181.
- Liu, W., and Westrup, C. "ICTs and Organizational Control Across Cultures: The Case of a UK Multinational Operating in China," in *Organizational Information Systems in the Context of Globalization*, M. Korpela, R. Montealegre, and A. Poulymenakou (eds.), Kluwer Academic Publishers, Boston, 2003, pp. 155-168.
- Macome, E. "On the Implementation of an Information System in the Mozambican Context: The EDM Case," in *Organizational Information Systems in the Context of Globalization*, M. Korpela, R. Montealegre, and A. Poulymenakou (eds.), Kluwer Academic Publishers, Boston, 2003, pp. 169-184.
- Madon, S. "The Internet and Socio-Economic Development: Exploring the Interaction," *Information Technology and People* (13:2), 2000, pp. 85-101.
- Mosse, E., and Sahay, S. "Counter Networks, Communication and Health Information Systems: A Case Study from Mozambique," in *Organizational Information Systems in the Context of Globalization*, M. Korpela, R. Montealegre, and A. Poulymenakou (eds.), Kluwer Academic Publishers, Boston, 2003, pp. 271-290.
- Okunoye, A., and Karsten, H. "Global Access to Knowledge: Findings from Academic Research Organisations in Sub-Saharan Africa," *Information Technology and People* (16:3), 2003, pp. 353-373.
- Orlikowski, W. J., and Baroudi, J. J. "Studying Information Technology in Organizations: Research Approaches and Assumptions," *Information Systems Research* (2:1), 1991, pp. 1-28.
- Reilly, K., and Gómez, R. "Comparing Approaches: Telecentre Evaluation Experiences in Asia and Latin America," *Electronic Journal of Information Systems in Developing Countries* (4:3), 2001, pp. 1-17.
- Sahay, S., and Walsham, G. "Scaling of Health Information Systems in India: Challenges and Approaches," *Information Technology for Development* (12:3), 2006, pp. 185-200.
- Sayed, E. H., and Westrup, C. "Egypt and ICTs Bring National Initiatives, Global Actors and Local Companies Together," *Information Technology and People* (16:1), 2003, pp. 93-110.
- Sen, A. *Development as Freedom*, Oxford University Press, Oxford, UK, 1999.
- Shoib, G. M., and Nandhakumar, J. "Cross-Cultural IS Adoption in Multinational Corporations: A Study of Rationality," in *Organizational Information Systems in the Context of Globalization*, M. Korpela, R. Montealegre, and A. Poulymenakou (eds.), Kluwer Academic Publishers, Boston, 2003, pp. 435-454.
- Silva, L., and Figueroa, E. B. "Institutional Intervention and the Expansion of ICTs in Latin America: The Case of Chile," *Information Technology and People* (15:1), 2002, pp. 8-25.
- Walsham, G. "Cross-Cultural Software Production and Use: A Structural Analysis," *MIS Quarterly* (26:4), 2002, pp. 359-380.
- Walsham, G. *Making a World of Difference: IT in a Global Context*, Wiley, Chichester, UK, 2001.
- Walsham, G., and Sahay, S. "Research on Information Systems in Developing Countries: Current Landscape and Future Prospects," *Information Technology for Development* (12:1), 2006, pp. 7-24.
- Warschauer, M. "Dissecting the 'Digital Divide': A Case Study of Egypt," *The Information Society* (19:4), 2003, pp. 297-304.