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Are we making a Better World with Information and Communication Technology for Development (ICT4D) Research? Findings from the Field and Theory Building

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EDITORIAL

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Introduction

As Information and Communication Technologies (ICTs) continue to penetrate people's lives the world over, there is a sense that understanding the role of ICTs in the context of development needs to be conceptualized theoretically while making empirical contributions that add to what we know (Avgerou, 2008; Davison, 2012; Sein and Harindranath, 2004; Sahay and Walsham, 1995). Other scholars have pointed to the importance of this research for the field of Information Systems (ISs) in offering broader contributions. Avgerou (2008) suggests that in the era of globalization such research offers contributions in ISs beyond "organizational organizational and national boundaries and support global economic and political activities" (p. 134). If the concept of development can be used to conduct research and offer contributions that lead to improvements in people's lives globally, then it follows that we should be, at some level, making a better world. The purpose of this editorial is to understand the challenges faced by scholars hoping to make contributions to this field and explore the ways in which they may continue to create a better world.

In his research commentary entitled "Are we making a better world with [Information and Communication Technology] ICT", Geoff Walsham (2012) argues that the ISs field has changed dramatically. He states that ICTs are pervasive in all organizations around the world as new technologies continue to proliferate and even the poor of the world have started to get engaged with ICTs, largely through the phenomenal growth in ownership and usage of mobile phones. He offers a unifying vision for the ISs Field by suggesting more interdisciplinary research to make a better world with ICT. He offers the Information and Communication Technology for Development (ICT4D) subfield as an exemplar of such interdisciplinary research to show that in addition to the unifying vision, researchers can adjust their ethical goals and critical agendas to investigate how ICTs can support the poor and identify who is being left out. In particular, can the spread of smartphones, he asks, enable the poor to access the Internet and how can this help to reduce poverty? (Walsham, 2012, p. 91).

Despite the above exemplar, it has been argued that ICT4D research fails the poor (Harris, 2015). It fails the poor because: (1) few researchers engage in advancing policy positions needed to make a difference, choosing instead to focusing on highly specialized, largely quantitative studies that make ICT4D research less accessible to the general public; (2) ICT4D researchers do not engage closely with the users of their research findings thus disconnecting findings from real-world issues; and (3) reinforced by a publish or perish culture that is obsessed with citation

rates and impact factor, few researchers engage in advancing policy positions or contributing to practice (Harris, 2015; Davison, 2012). While they may be well-intentioned, there is a sense that technology development projects also fail the poor by failing to address the challenges that they face (Easterly and Easterly, 2006; Heeks, 2002; Kleine and Unwin, 2009). This view is shared by Davison (2012), who adds that "in order to make a better world, changes are needed in our research and practice" (p. 100). He argues that the "straightjacket of approved journal lists" regulate researcher's freedom of choice with respect to venues for publication of research. Given that journals are compelled to promote research that is both practically relevant and conforming to standards of scholarly rigour, reviewers are not always so broad-minded as to accept research that promotes a broader ethical agenda of making a better world. Hence the pragmatic researcher is likely to choose research topics, methods and approaches that are more orthodox and aligned with the *status quo*, so as to maximize publication potential. He surmises that "This kind of myopic reverence for orthodoxy and disdain for the new is misplaced. Instead of a deluge of well-done trivia, we need an iconoclastic approach to orthodoxy and a flourishing of innovative research that contributes to making the world a better place" (Davison, 2012, p. 100).

Such calls to action have been echoed by academics from around the world, at conferences such as the International Conference on Information Systems (ICIS) and by practitioners and policy makers working in developing countries at the ICT4D conferences. A notable ICIS panel entitled "Self-Marginalized or Uninvited? The Absence of Indigenous Researchers in the Arena of Globalized ICT4D Research", took this conversation forward. The panelists identified a compelling issue: while ICT4D research has attracted increasing interest from both scholars and policy-makers, most scholars in this area are neither indigenous to nor live in the countries in which they study the effects of ICT on Development (Joia, Davison, Diaz Andrade, Urquhart, & Kah, 2011). There is a sense that ICT4D research is based primarily on Western discourse with concepts and theories developed in the West being transported to people in far way countries. The idea being that despite the limited applicability of these findings, people in poor countries may somehow benefit from the research created and published in the Western hemisphere. Perhaps it has been such calls to action that has led to multiple special issues in the ICT4D area by mainstream ISs Journals.

Yet, despite all this attention to the cause of ICTs to make a better world, pertinent questions still remain to be investigated. The key questions that enable academics to make contributions to their field and practitioners to use these contributions to enabling ICT implementations and policies that improve people's lives remain to be discovered. They revolve around issues of: what does Development mean? How can it be studied? And to what purpose or effect? What does it take to "make the world a better place"? Our reviewers and editors need to evaluate submissions by asking these additional questions: does this paper make a difference? Does it contribute to making the world a better place? Why would we care if a technology is adopted if it does not make a difference in practice?

My contribution here is to offer a typology for ICT4D research that may help scholars to create a better world. Armed with this lens, the reader can determine to what extent the contributions of papers they read offer insights into how ICTs may offer improvements in people's lives. Hopefully this will enable the research they read and generate to be used to create a better world. The following sections isolate the origin of this dichotomy in a short history of Development and offer ways in which ICTs may be studied in ways that offer contributions for a better world.

Understanding development: a short history

The roots of this Western bias in development research and practice lie in historical precedence. The above questions remain as relatable today as they have been over 60 years ago when

international development agencies and development banks were brought into existence with the aim of reducing poverty and hunger in the world. It was following the destruction from WWII when phrases such as "the third world", "developed north" vs "under-developed south" and "developing countries" came into existence to delineate the difference between poor and rich countries in an effort to reduce poverty in parts of the world other than the West. This was also a time when Western nations created international organizations and interventions to ensure that the economic crisis of the 1930s would never happen again. At the Bretton Woods conference in 1944, three key international institutions were created to promote stable economic growth within the capitalist system. These are the International Monetary Fund (IMF), the World Bank Group and the General Agreement on Tariffs and Trade (GATT) replaced by the World Trade Organization (WTO) in 1995 (Willis, 2011). Europe, devastated by war was the first to benefit from United States (US) development aid through the Marshall Plan in April 1948. Its aim was to fight "hunger, poverty, desperation and chaos" (Marshall, 1947, p. 1). While opinions vary on the success of US Aid to Europe and other countries, the basic philosophy of the Marshall Plan persists to this day: The prosperity of the USA and other developed countries depended upon alleviating poverty and low economic development in developing countries. As long as poverty persists, Marshall argued, there cannot be "normal economic health in the world, without which there can be no political stability and no assured peace" (Marshall, 1947, p. 1). With the Cold War looming, US policy makers found it imperative to craft social, economic and political policies based in Capitalism in order to defeat Communism. Thus in began the era of development known as *Modernization.*

Theories of Modernization are based on the notion that technological knowledge, tools and techniques developed in the West should be used to develop economies that are poor. They contend that aid given to poor countries connected to requirements for political, structural and social changes will lead to economic growth (Escobar, 2011; Irwin, 1975; Willis, 2011). Modernization is also seen as a construct with specific variables that can be used to measure economic development; modernization is often directly associated with higher levels of techno-logical progress (Irwin, 1975). The result has been the rise of government institutions that were, in principle, tasked with guiding progress. In some countries, greater levels of government involvement lead to protectionism, while in other countries, government regulation was limited to supporting businesses through foreign direct investments. There was a sense that Modernization policies were causing recipients of aid to become dependent on their donors. Some would argue that such aid even prevented countries from developing (Easterly and Easterly, 2006). Escobar (2011) argues that policies based on Modernization have been "the single most important cause of the current global/energy/climate and poverty crisis" (p. 290). Modern agricultural techniques touted through some development aid projects and investments by multinational organizations bring about erosion and increase the detrimental effects of climate change – particularly in some Latin American countries. Agro-ecological food production systems are an example of how localized food production systems can potentially lead us out of the climate and food crisis by preserving soil from erosion (Escobar, 2011).

After the economic crisis of the 1970s, increasing globalization and rising inflation, *Neoliberalism* materialized as the predominant doctrine for development efforts. It is a "theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets and free trade" (Harvey, 2005; p. 3). State involvement, beyond the creation of institutional frameworks, was regarded as detrimental to development efforts (Willis, 2011). The age of Neoliberalism saw the rise of and increased participation of Non-Governmental Organizations (NGOs), the private sector and individuals in development efforts. The increased participation of NGOs in

development projects lead to a greater emphasis in "grass roots" or "bottom up" development efforts because they were able to provide services that were much more appropriate to local communities. In particular, processes of empowerment, participation, democratization and civil society became central to the development agenda as western governments began channeling their aid through NGOs (Willis, 2011).

While the Neoliberal era of deregulation, market capitalism and personal freedoms did stimulate entrepreneurship in local communities, it was tempered by economic, social and political instability in the world. With the advent of the 11 September 2001 attacks which transformed geopolitics with the escalation of US military involvement, the Arab Spring which toppled autocratic governments in the Middle East and the subsequent global financial crisis in 2008 which brought about a global recession, development efforts became pragmatic. Multiple theories of *Sustainable Development* have come to the forefront of development efforts. Sustainable development efforts range from market-led economic development, waste management, pollution reduction and other 'technocentric' approaches that focus on improving people's standards of living and quality of life; to 'ecocentric' approaches such as environmental protection policy to reduce consumption and waste, that start with the premise that the Earth is more important than human progress and economic development (Willis, 2011; Enders and Remig, 2014). While these approaches are not mutually exclusive and often overlap, sustainable development is about matching the most appropriate approach for the needs of a community.

The world has changed considerably since the inception of development institutions, theories and their policy interventions. There is a sense that development theories, policies and interventions from the Western institutions may not be suited to the conditions of the countries they intend to improve (Easterly and Easterly, 2006; Escobar, 2011; May, Dutton, & Munyakazi, 2014; Willis, 2011). The United Nations (UN) Millennium Development Goals (MDGs), established in 2000 with the signing of the Millennium Declaration by UN member states, were seen as a key step in establishing desirable development outcomes. The MDGs comprise eight goals, 18 targets and 47 indicators. The goals are to (1) eradicate extreme poverty and hunger, (2) achieve universal primary education, (3) promote gender equality, (4) reduce child mortality, (5) improve maternal health, (6) combat HIV/AIDS, Malaria and other diseases, (7) ensure environmental sustainability and (8) develop a global partnership for development. While this attempt at tackling key development issues was commendable in bringing the development discourse to the forefront of political discourse, it was also seen to scaffold the problem of development by locating it exclusively in the 'third world' with an agenda created by industrialized countries without adequate consultation (Easterly and Easterly, 2006; Summer and Tribe, 2008).

Even as long-standing paradoxes in the development discourse linger, new dilemmas are created. The classification of countries is not only dated but misleading. Some European countries, classified as *developed*, are experiencing poverty and negative growth rates. For example, Italy has experienced negative growth and falling per capita incomes for the past five years and Greece recently went bankrupt. At the same time, the IMF has included China, India, Russia, Brazil and Mexico to its list of richest countries in the world. While many classifications are used to categorize countries between rich and poor, the challenge for development theorists and practitioners is in improving the lives of people in all the countries of the world. Classifications abound to help understand the differences: Sub-Saharan Africa, Emerging market Latin American and the Caribbean, Middle East and North Africa, ASEAN, Central and Eastern Europe, European Union and G7. New sub groups have been created: Newly Industrialized Countries (NICs), Middle Income Countries (MICs) and Least Developed Countries and Low Income Countries under Stress (LICUS) (Summer and Tribe, 2008; World Bank, 2015a). These labels continue to compartmentalize the problem of poverty further removing us from tackling the source of the problem (Easterly and Easterly, 2006).

In reality, poverty is not restricted to any one country. Poverty is a ubiquitous phenomenon that can be found the world over with widely differing characteristics and outcomes in terms of nutrition, health and incomes that affect people's ability to achieve improvements in their lives. When appropriately implemented, ICTs can and have been shown to enable improvements in people's lives wherever they live. Armed with our historical understanding of development thus far, the following section explores: how can we understand the role of ICTs in making a better world?

The role of ICTs in making a better world: a typology for ICT4D research

We have an opportunity as a community of scholars and practitioners to define, expand and offer contributions to development that improve the lives of people regardless of the communities and countries they reside in. We no longer need to transport our theories and technologies created in the West to countries in the Southern hemisphere. Given the significance of innovations in mobile payments taking place in Africa, we have an opportunity to offer contributions that are relevant to communities there and even learn from the innovations taking place there. Prevalent in the ICT4D field are cases, vignettes and studies of how entrepreneurs in villages and city slums use mobile phones to achieve better livelihoods, fishermen and farmers arrive at better markets through access to information they would not have had without the access to ICTs and the famous telephone ladies who went on to run successful business from profits made from selling their mobile phone time. In drawing upon these studies, we can move development discourse forward by offering meaningful theoretical and technological contributions for people living in poverty in the USA and Europe with little or no access to ICTs, such as mobile payment systems that have helped so many come out of poverty in Africa and Asia. The use of ICTs to help people achieve better lives is the subject of contributions made in this Journal and other publications in the ICT4D field. While these studies offer rich descriptions of improvements in people's lives from ICT usage, do we know how or what ICT interventions actually lead to these improvements? Presumably, if ICT usage by people struggling to survive can lead to improvements in their lives, could we be making a better world with ICTs?

We may draw upon established measures to see how the use of certain more ubiquitous ICTs may affect livelihoods. Poverty in the poorest countries of the world such as Burundi or Niger is very different from the face of poverty in the USA or Europe. Yet, it exists in all the countries of the world, including the western World. Poverty can be measured through constructs that enable comparative analysis such as Purchasing Power Parity (PPP) which measures ability to pay for needed goods and services, the GINI co-efficient which measures the gap between rich and poor in a country, the human development index which offers a view of human capital in a country and money metrics that measure financial poverty. May et al. (2014) offer a multi-dimensional view of poverty in which they used monetary metrics, including the GINI co-efficient together with human capital indicators to investigate poverty in a set of east African countries. They found that while financial poverty increased in the countries they studied, some countries such as Kenya saw in an increase in human capital. Kenya also has the largest number of users in the world of mobile payment systems, primarily through M-Pesa. Such findings indicate that there are many ways to find out why such discrepancies take place. Table 1 illustrates the different means by which we may study ICTs for Development:

The effects of ICTs in improving people's lives can be studied at the individual, organization, country, region and the world levels. Individuals interact within households, families and communities that affect their wellbeing. Development at this level is about enlarging people's choices so that they may have the freedom to pursue the lives they value. In this, income is seen to be an instrument of this freedom to pursue their wellbeing. Sen argues that

Table 1. Typology for ICT4D Research.

Level	Unit of analysis & indicators	Type	ICT use	Development outcomes
Individual	Capability, personal freedoms. HDI, GDI, HPI	Entrepreneur employee, employer, homemaker	Mobile phone, tele-center	Are people able to pursue better livelihoods? Do ICTs help their wellbeing?
Organization	Micro-enterprise	Sole owner, partnership	Mobile phone	Do ICTs enable micro-entrepreneurs to lead the lives they choose?
	Small enterprises	Limited liability, joint ownership	Mobile phones, Internet and e-commerce	Do ICTs enable new markets to be accesses? Are the information, expertise and skills accessed helping income to be generated and to create new jobs? Is the use of ICTs enabling increased productivity?
	Medium enterprises	Limited liability	Mobile phones, Internet and e-commerce	
	NGOs/Social Enterprises	Non-profits	Mobile phones, Internet and e-commerce	Are the ICTs used addressing the needs of the communities? Are there workforce development, learning or new skills generated through the use of ICTs?
	Corporations, MNCs	Public and private	Broadband Internet, e-commerce	Are local and indigenous communities being affected? Are ICTs enabling improvements in working conditions?
Country	GDP, PPP, HDI, HPI, Gini Coefficient, Poverty and Equity, Education, Health, Environment	Geographic: Small Island States, Openness: emerging economies; Income levels: high, middle, low	Infrastructure, last mile and ICT diffusion	Economic, Social, Human Development. Do ICTs enable access to food, health, education and other basic necessities? Are disparities in a country being reduced through the provision of ICT infrastructure?
Region	MDG indicators, poverty and equity, education, health, GEP	Geographic, economic integration, climate change	Infrastructure, last mile, ICT diffusion, digital divide	Regional Development. Can ICTs support more efficient and effective inter-governmental networks?
World	GEM, energy, population, Global Findex, SE4ALL, climate change	Environment protection, health, social, political and economic	Gaps in ICT penetration and coverage, global digital divide	Equitable Global Development. Are renewable resources being used? How equitable is access to these resources? Are ICTs enabling better monitoring of natural disasters?

there need to be a broad set of conditions that include access to food, shelter, health and education that together constitute wellbeing (Sen, 2001). While wellbeing may vary considerably between individuals, indicators to measure wellbeing include the United Nations Human Development Index (HDI), the Gender Development Index (GDI) and the Human Poverty Index (HPI).

The majority of research in ICT4D takes place at the organizational level. The use of ICTs by NGOs, small and medium-sized enterprises (SMEs) has been shown to enable growth, particularly through sustained technology and training interventions (Qureshi, Kamal, & Wolcott, 2010). Micro, small and medium enterprises, as well as Social Enterprises and NGOs appear to be at the heart of efforts to understand the effects of ICTs on Development. Case studies and vignettes of how these small businesses use technology to grow, throw valuable light on the needs of people in their respective communities. While the definitions of these forms of organization vary between countries, it has been argued that they are more efficient at creating quality jobs, are more innovative or grow faster than larger firms (Gibson and van der Vaart, 2008). Seen as a form of small business, social enterprises and NGOs are also key players in enabling ICT usage to support better livelihoods. Their activities offer non-profit earned income which in turn provides consistent cash flow to further the mission of the organization (Lyons, Townsend, Sullivan, & Drago, 2010).

In particular, the use of mobile phones by NGOs, micro and small enterprises have been shown to increase the wellbeing of the micro-entrepreneurs by bringing about greater price transparency and elimination of waste (Donner and Escobari, 2010). It has been argued that mobile devices represent a way for entrepreneurs to overcome the challenges of doing business as they support communication, enable market information to be accessed, reach new customers, sell their products across geographic areas, get paid through mobile payment systems and empower women (Aker and Mbiti, 2010; Chew, Ilavarasan, & Levy, 2013; Donner and Escobari, 2010; West, 2012). While the majority of studies focus on the explosive growth of mobile phone usage in Africa, Asia and Latin America, few if any, consider the effect of this ubiquitous technology on the wellbeing of people in North America and Europe. In his review of the literature on mobile usage, Donner (2008) categorized these studies on mobile adoption, mobile impact and mobile interrelationships. He found that ICTD studies consider mobile adoption through digital divide, mobile impact on economic growth and livelihoods and mobile interrelationships through the evaluation or design of ICTD projects. Donner (2008) categorized ISs studies as non-ICTD studies which consider the interactions between people and technology with little contribution to development; hence supporting Walsham's (2012) view of the need for research in ISs to offer contributions to making a better world.

Country studies abound in ICT4D research. ICTs measured in terms of penetration of mobile phones, broadband internet, TVs, Radio and land lines can be seen to enable the capabilities of citizens to achieve wellbeing. There are a number of Indicators, based on Sen's (2001) and others, used to assess the ability of a country to provide its people with basic "freedoms". These are (1) rights of political participation and freedom of speech, (2) economic opportunities to participate in trade, (3) social opportunities of adequate health and education, (4) openness in government and (5) security in the form of law and order and basic social safety nets for the unemployed. Some of the most commonly used indicators of income capability are: the Gross Domestic Product (GDP) or a country's income is calculated in millions of US dollars; given that GDP may not reflect cost of living, the PPP offers a measure of the real value of output produced by an economy compared to other economies; and perhaps the most important is the Gini index which measures the disparities in income within a country (World Bank, 2015b).

Regional and global studies measure aggregate development. Studies on the effects of telecommunications and other ICT infrastructure on the growth and productivity in a region or group

of countries can throw insight into improving people's standards of living and quality of life while ensuring that environmental protection against climate change. Some of the indicators used at the regional and global level are: Sustainable energy for All (SE4ALL), which attempts to measure global energy efficiency and share of renewable energy; Global Economic Monitor (GEM) provides data on consumer prices; high-tech market indicators; industrial production and merchandise trade; and Global Economic Prospects (GEP) which provides short, medium and long-term outlook for the global economy and the implications for developing countries and poverty reduction (World Bank, 2015b).

ICT4D scholars may use the above framework as a lens to decide to what extent their own research or the papers they read contribute to making a better world. The questions offered under the "development outcomes" column are designed to guide the researcher in crafting questions that may help them focus on research that contributes to helping people use and implement ICTs for improving the lives of people they study.

Findings from the field and theory building: mobile phones and entrepreneurship

The papers in this issue tackle some very important aspects of ICTs for development: the use of mobile phone by entrepreneurs in micro-, small- and medium-sized businesses. This first paper in this issue entitled "Mattering Matters: Agency, Empowerment, and Mobile Phone Use by Female Microentrepreneurs", is co-authored by Han Ei Chew, Vigneswara Ilavarasan and Mark Levy. The authors attempt to enrich our understanding of the role that mobile phones play in the empowerment of women in the developing world. They use an innovative social psychological concept termed "mattering" to examine the impact of mobile phones on social development outcomes. Mattering, they state, is the perception that others depend on us, are interested in us and are concerned with our fate. They argue that when gender inequality exists, women are not only disadvantaged economically and politically, but may also perceive that who they are and what they do are of little consequence to their significant others – that they do not matter. The authors see mattering as a psychological asset or resource that might help expand an individual's agency, i.e. an individual's capacity. They argue that the utility of mattering is important for the ICT4D community. Based on a sample of 335 female microentrepreneurs in Chennai, India, we created a valid and reliable measure of mattering and its three dimensions. Mattering was predicted by (1) entrepreneurial expectations, an element of an individual's mindset; (2) social use of mobile phones; and (3) the perceived benefits of mobile phones for maintaining business networks. Findings suggest that mobile phone use plays a significant role in contributing to female entrepreneurs' perception that they matter.

The second paper in this issue entitled "An Empirical Study of Factors Affecting e-Commerce Adoption among Small- and Medium-Sized Enterprises in a Developing Country: Evidence from Malaysia" is co-authored by Syed Zamberi Ahmad, Abdul Rahim Abu Bakar, Tengku Mohamed Faziharudean and Khairul Anwar Mohamad Zakic. The purpose of this paper is to empirically examine determinants of e-commerce adoption among Malaysian small- and medium-sized enterprises (SMEs). Despite the many benefits of e-commerce adoption by SMEs, the authors contend that most SMEs who have adopted e-commerce have not moved beyond the entry-level adoption and it has not been easy for SMEs to adopt e-commerce partly due to the continuous change of e-commerce technology, the varying needs of local and global businesses and the high cost of acquiring e-commerce infrastructure. Together these conditions make the gap between SMEs and large firms greater and may affect SME's competitiveness and survival in the long run. This study tested eight hypotheses on determinants affecting e-commerce adoption with empirical data from several survey instruments: an online questionnaire-based survey, mailed survey and questionnaire

collected in-person from a sample of 307 SMEs in Malaysia. The findings show that e-commerce adoption within Malaysian SMEs is affected by perceived relative advantage, perceived compatibility, managers/owner's knowledge and expertise, management characteristics and external change agents. This study contributes to enhancing the understanding of the determinants of adopting e-commerce in SMEs and provides some interesting perspective from Malaysia. Those parties interested in promoting their business online may find these results helpful in guiding their efforts.

The third paper in this issue entitled "Information system success among manufacturing SMEs: case of developing countries" is co authored by Morteza Ghobakhloo and Sai Hong Tang. The authors contend that despite the importance of SMEs as one of the major sources of employment, technological advancement and competitive advantage, little is known as to how to evaluate the success of ISs within the SME sector. This research develops an integrated model of IS success based on the DeLone and McLean (2003) ISs success model. The DeLone and McLean model of information systems success: A ten-year update. Journal of Management Information Systems, 19(4), 9–30) IS success model and the technology–organization–environment framework of the firm to provide SMEs with the relative importance and knowledge of IS success. A questionnaire-based survey was conducted to collect data from 316 Iranian and Malaysian manufacturing SMEs. The author's findings show that the determinants of ISs success among SMEs are not limited to the technological factors identified in the DeLone and McLean (2003) ISs success model. They found that ISs success among SMEs is also determined by some key organizational and environmental determinants. They observe that the involvement of both top management and employees in different stages of ISs implementation is important and ISs success among SMEs requires internal and external support. The study contributes to the theory by extending and empirically testing the DeLone and McLean ISs success model in a different setting than in the previous studies. The study can serve as a basis for future research in this field through advancing the theoretical development in the area of ISs success.

"The Impact of Leadership Orientation on Strategic Information System Planning Processes, with an Application to Libyan Organizations" co-authored by Esam Osman, Ibrahim Mohamed El Beltagi and Glenn Hardaker is the forth paper in this issue. The authors argue that the planning stage in the development of an IS is important for IS/business alignment. Accordingly, academics and practitioners in both developed and developing countries are concerned about the impact of leadership orientation on strategic IS planning (SISP). The focus of this research is to identify the nature of the relationship between leadership orientations and ISs planning approaches in the context of Libyan organizations. To investigate this relationship, a postal survey was conducted to collect data from 117 executives responsible for ISs planning. The questionnaire asked about leadership values and SISP approaches using multi-item, multi-scaled questions. The results show that "controlling" and "competing" leadership orientations have a positive direct effect on all SISP approaches. Coordinator leadership orientations exhibited the highest positive association with rational, adaptable and intuitive SISP approaches. The results of this research will have important implications for Libyan organizations, especially as they attempt to rebuild the country's economy after the Libyan revolution. These implications are discussed in detail in the paper.

Richard Heeks, Logakanthi Subramanian and Carys Jones co-author the fifth paper in this issue which is titled "Understanding e-Waste Management in Developing Countries: Strategies, Determinants, and Policy Implications in the Indian ICT Sector". The authors identify an important issue in sustainable development. They state that the management of e-waste is a growing problem for developing countries; one that may undermine the sustainability of ICT use if not addressed. They focus on a somewhat under-emphasized group that contributes significantly

to developing country e-waste: local organizational consumers of ICT. Although this group creates the majority of e-waste, the factors shaping their e-waste decisions are not well understood. The purpose of the author's in the paper is to provide such an understanding. This paper, therefore, builds conceptual models of e-waste strategies and e-waste strategy determinants from the environmental management literature. It applies these models to a key e-waste producer – the ICT services sector in India – drawing qualitative data from a mix of very large and small/medium firms. While the former have been proactive in their e-waste strategy, the small/medium firms are characterized as indifferent to e-waste; a divergence explained by the very different strengths of determining factors to which they are subject. In turn, those factors relate to the size of these ICT consumers and the nature of value chains into which they are placed. Understanding these determinants can help us plan better e-waste interventions; a point illustrated through critique of recently introduced legislation.

"Mapping the Patterns of Mobile Phone Usage Among Fishermen in Malaysia", co-authored by Hayrol Azril Mohamed Shaffril, Siti Zobidah Omar, Jeffrey Lawrence D'Silva and Jusang Bolong is the sixth paper in this issue. While it has been shown in many studies that fishermen and farmers use mobile phones to achieve better livelihoods, the authors of this paper identify the patterns of mobile phone usage among fishermen in Pangkor Island in Malaysia. This study is quantitative in nature, where a total of 250 fishermen were selected as the respondents. The findings confirm that although the majority of fishermen do not spend much time and money on making and receiving calls and messaging, the mobile phone is still a crucial tool for them, particularly in its role in enhancing their safety and easing the communication process with their family while conducting their fishing operation. Although the mobile phone has superior functions in marketing, fishermen in Pangkor Island seem to place less importance on it. The findings also show the similarities and differences relevant to the patterns of mobile phone usage in Pangkor Island, and hopefully this can be applied to other fishing areas and further intensify the development in the fisheries industry.

"Theory Building for ICT4D: Systemizing Case Study Research Using Theory Triangulation" by William John Tibben is the seventh paper in this issue. The author suggests that despite the popularity of case study methods in ICT4D research alludes to a number of challenges that practitioners, policy-makers and theorists face. He argues that while case study methods are appropriate for capturing influences that physical and social environments exert on the adoption of ICT, building a cumulative body of knowledge is not straightforward. This paper responds to the need for greater systemization of ICT4D case study research by describing a study of multiple cases which used theory triangulation to establish its analytical bearings. He adds that the popularity of case study methods in ICT4D research presents challenges in comparing findings across studies for the purpose of theory building. The object of this paper is to describe a qualitative study in which theory triangulation was used to systematically compare multiple cases to develop theory. The concept of development provided the theoretical context for the study. The work of Hall and Midgley was used to provide three rival philosophical positions that give rise to differing approaches to social development. These are: populist, enterprise and statist. The application of these three contrasting perspectives using theory triangulation is demonstrated in the analysis of multiple case studies taken from a community technology center program in Australia. The relative strengths and weaknesses of each approach are identified and used as the rationale for theory development.

There are two papers in this Journal's view from practice section. The first view from practice paper in this issue is titled "Assessing Mobile Technology Usage for Knowledge Dissemination among Farmers in Punjab" co-authored by Lokesh Jain, Harish Kumar and R.K. Singla. The authors address a well-known need. They state that agriculture-based precise and accurate information needs to be disseminated promptly to farmers so that better

decisions such as managing farm fields, making continuous and scientific changes in their production systems and grabbing advantage of market opportunities can be made. In this paper, mobile technology is assessed for the agriculture information dissemination system. A survey has been conducted to find out potential technology, related to the use of the Internet and mobile among farmers in the state of Punjab in India, to deliver agriculture-related information to them. Results show that agricultural IS needs to be developed based on the mass communication technology such as mobile systems. They found that local and native language of farmers still need to be incorporated into the systems. The use of soft-computing techniques in conjunction with communication networks, for inferring the decision regarding best practices for agricultural activities would be helpful in the development of these systems.

The second practice paper in this issue is titled "Extending an ICT4D Computer Re-use Model with E-waste Handling Activities: A Case Study" and is authored by Bjorn Cumps. The author contends that the re-use of PCs may enable the global digital divide to be bridged, especially when organizations clearly indicate that they are exporting valuable assets to developing countries and not e-waste. This paper illustrates how a computer re-use model can be extended to deal with e-waste challenges, such as exposure to hazardous, toxic materials and detrimental environmental consequences. The author describes the re-use of computers as a factor that can help bridge the global digital divide. In an ICT4D context, refurbished computers can be used in developing countries. He describes and illustrates the operating model of such a computer re-use organization, highlighting the different components and interactions of the operating model. Next, he discusses how e-waste puts this computer re-use model under pressure and argues that the sustainability of computer re-use in an ICT4D context is seriously impacted by this increasing e-waste problem. Finally, he describes how a computer re-use model can be extended and complemented with e-waste handling activities to retain positive effects in an ICT4D context. The paper is based on a single case study.

Disclosure statement

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