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## **Discourses on ICT and development**

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### **Abstract**

Research on ICT and development (ICTD) involves assumptions on the nature of ICT innovation and on the way such innovation contributes to development. In this article I review the multidisciplinary literature on ICTD and identify two perspectives regarding the nature of the ICT innovation process in developing countries - as transfer and diffusion and as socially embedded action - and two perspectives on the development transformation towards which ICT is understood to contribute - progressive transformation and disruptive transformation. I then discuss the four discourses formed by combining the perspectives on the nature of IS innovation and on the development transformation. My review suggests that ICTD research, despite its remarkable theoretical capabilities to study technology innovation in relation to socio-economic context, remains weak in forming convincing arguments on IT-enabled socio-economic development.

### **Introduction<sup>1</sup>**

Research on the developmental potential and impact of information and communication technologies (ICT) is a multidisciplinary field. Contributing disciplines include Information Systems (IS) (Walsham et al. 2007), Human Computer Interaction (HCI) (Dearden 2008), Communication Studies (Mansell 2002), and to a lesser extent Development Studies (Wade 2002). Invariably, ICT and Development (ICTD) studies are based on the premise that ICT can contribute to the improvement of socio-economic conditions in developing countries (Mann 2004; Sahay 2001; Walsham et al. 2007). They all aspire to the realization of perceptions of desirable world orders, such as Sen's theory of capabilities (Kleine 2009; Madon 2004; Zheng 2009) or the United Nations' Millennium Goal vision of eradicating poverty (Gilhooly 2005). Nevertheless, more often than not, the development potential of ICT is a taken-for-granted, implicit assumption for particular research objectives, which

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<sup>1</sup> This paper draws extensively from two earlier publications: Avgerou, C (2008) "Information systems in developing countries: A critical research review" *Journal of Information Technology*, 23(3), 133-146 and Avgerou, C. (forthcoming) "Discourses on innovation and development in information systems in developing countries research", in Galliers, R. and Currie, W. *The Oxford Handbook of Information Systems*, Oxford, Oxford University Press.

range from the construction of technology applications suitable for developing countries<sup>2</sup>, through the facilitation of the spread of technologies (Kraemer et al. 2009), to understanding the institutional changes required for a developing community to benefit from ICT's developmental potential (Ma et al. 2005). But even if not explicitly acknowledged, every ICTD study makes specific assumptions about the way IT innovation happens in the context of developing countries and about the meaning and the nature of the process of 'development' towards which such innovation is intended to contribute.

Theoretical perspectives regarding the process of ICT innovation naturally vary between disciplines according to their focal interest. For example HCI experts tend to elaborate on the process of design of technology artefacts while IS researchers are concerned with the intertwined processes of technology development and organizational change. And while all ICTD research places emphasis on the socio-economic context of ICT innovation as a source of influences on the shaping of technologies and their consequences, there are significant epistemological differences regarding the nature of the process of technology construction and use that permeate disciplinary boundaries. Such variation of underlying research perspectives regarding ICT innovation within the broader socio-economic context of developing countries is one focal point of this article. The other is the process of development.

Development is a contested notion too, and it has been subject to a long theoretical debate. Moreover, development policy and action are entangled with conflicting interests and power relations in contemporary global and national politics, and the international development agencies' policies for economic growth and institutional reform are widely contested in developing countries. Most ICTD studies avoid engaging with controversies on 'development'. They tend not to discuss what constitutes development. There are, however, some noticeable exceptions. Thompson (2004) drew from Escobar's Foucauldian critique of the discourse on development and voiced concern about the development policies that IS innovation interventions are intended to support (Thompson 2004). Some authors have taken a critical stance to the currently prevailing view of development that drives the discourse on digital divide and justifies IS innovation in terms of creating a country's competitiveness capabilities in a global free market (Wade 2004a; Warschauer 2003). Others pointed out the ongoing controversies regarding development, development policy, and the role attributed to IT in various development policies (Avgerou 2003; Ciborra 2005).

The combination of assumptions regarding the nature of IS innovation effort and development as the aim or outcome of IS innovation gives rise to different discourses in ICTD research. I use the term 'discourses' to refer to the research approaches stemming from different assumptions on the fundamental nature and consequences of IS innovation. Approach is too vague a term, while 'discourse' indicates more specifically the research language of concepts, theories, and methods, through which researchers form the object of a research study and construct arguments about it.

My main literature sources for this paper are the specialist journals on ICTD, namely *Information Technology for Development*, *Information Technologies and International Development*, and the *Electronic Journal of Information Systems in Developing Countries*; the proceedings of the series of conferences on ICT in developing countries organized by the IFIP WG9.4 (Avgerou and Walsham 2000; Bhatnagar and Bjørn-Andersen 1990; Bhatnagar and Odedra 1992; Krishna and Madon 2002; Krishna and Madon 2003; Odedra-

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<sup>2</sup> See, for example, the posters section of <http://www.ictd2009.org/documents/ICTD2009Proceedings.pdf>

Straub 1996; Roche and Blaine 1996; Sahay and Avgerou 2002); and the proceedings of the series of IEEE/ACM International Conferences on Information and Communication Technologies for Development <sup>3</sup>. In addition, I reviewed articles on developing countries published in the general IS journals, some of them in special issues on IS in developing countries research <sup>4</sup>.

In the next section I present two perspectives regarding the nature of the ICT innovation process in developing countries: as transfer and diffusion and as socially embedded action. I demonstrate these two perspectives with examples from the ICTD literature that elaborates on the role of culture in ICT innovation. In the following section I distinguish between two perspectives on the nature of development transformation towards which ICT is understood to contribute, progressive transformation and disruptive transformation, and I illustrate them with examples drawn from the literature on telecentres. I then discuss the four discourses formed by combining the perspectives on the nature of IS innovation and on the nature of development transformation, and demonstrate them with examples from the literature on software industries in developing countries. Finally, in the conclusions, I argue for the development of theoretical capabilities for studying IS innovation in relation to socio-economic contexts and the need to theorize IT-enabled socio-economic development.

### **ICT innovation in developing countries**

ICTD research has been shaped with awareness of the relentless ICT and organizational innovation taking place in advanced economies of the world - primarily North America and Europe - and of the increasing socio-economic interconnectedness of all countries and regions in the condition named globalization. Thus, a common assumption in ICTD research is that developing countries are in disadvantage in relation to the ICT innovation experiences in the context of origin of new technologies. This culminated in the notion of 'digital divide' signifying a new form of inequality. A great deal of research focused on the significance of this problem and sought to monitor progress in reducing it (Kenny 2000; Mbarika et al. 2003; Wresch 1998). Most ICTD research, though, tends to focus on the experiences and consequences of ICT development and use, rather than the limitations of technical resources that inhibit it. Such research too tends to make the assumption that technological and institutional trends are set elsewhere, and available ICT artefacts as well as business models deemed necessary for their use may not be meeting developing countries' needs. Thus, difficulties faced in following trends and standards of ICT-enabled globalization and in practicing ICT innovation effectively feature frequently in research questions and findings of ICTD research, see for example (Heeks 2002).

Framed in juxtaposition to innovation originating elsewhere, research on ICT in developing countries acknowledges and addresses distinctions of context. The context where a new technology artefact and business model first took shape (usually in an advanced economy) may be different from the context where this combined artefact and model are implemented as part of IS innovation practice in a developing country. Moreover, the socio-organizational settings of ICT development and use within sectors, countries, or regions may differ substantially from each other – for example e-government is practiced

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<sup>3</sup> <http://itidjournal.org/itid/article/viewDownloadInterstitial/240/110>  
<http://www.ictd2009.org/documents/ICTD2009Proceedings.pdf>

<sup>4</sup> See, *The Information Society*, vol 19, no.1, 2003; *Information Technology and People*, vol. 16, no.1, 2003; *MISQ*, vol 31, no 2, 2006.

differently and with different results in countries with different public administration sectors.

Two different orientations towards addressing issues of context are discernible in the *universalistic* and *situated* research traditions of IS and HCI research and influenced ICTD research (Avgerou and Madon 2004; Dourish 2004). Universalistic perspectives elaborate on the value of ICT and information and on the processes of IS innovation through which such value can be realized in terms of general techno-economic reasoning, independently from the particular circumstances of the social actors involved. For example they look for 'best practice', or for the most suitable new organizational form for the information age (Fulk and DeSanctis 1999; Scott Morton 1991). They often acknowledge contextual contingencies, but assume an overriding rationality that determines universal goals of ICT innovation and a single logic of action towards their satisfaction (Porter and Millar 1984). In contrast, situated perspectives consider IS innovation as enacted by social actors and tend to place emphasis on meaning making and practice within the *immediate setting* of the innovating organization (Orlikowski et al. 1996; Suchman 1994). The universalistic and situated perspectives are discernible in two different ways of addressing issues of context in ICT in developing countries research, either in terms of *transfer and diffusion* processes or in terms of *socially embedded* processes.

### ***Transfer and diffusion***

This perspective considers ICT innovation in developing countries as a process of diffusion of knowledge, which is transferred from advanced economies and adapted to the conditions of a developing country. It assumes that the material/cognitive entities that comprise IS technologies and associated practices of organizing are adequately independent from the social circumstances that give rise to them to be transferable, more or less intact, into any other society. Subject to suitable adaptation, these entities can make a desirable developmental impact. Such research, therefore, traces the particular factors that capture the differences of the recipient country and the organization that are likely to affect the process of technology development and use - such as economic conditions, technology competences, people's attitudes to IT, and institutionalised work habits.

Authors often shape their research in the conceptual terms of the theories of technology diffusion and technology acceptance (Davis 1989; Rogers 1995). For example Rose and Straub (1998) and Al-Gahtani (2003) use Davis' technology acceptance model to study ICT use in the Arab world, and identify empirically the particular factors of the social and organizational context of the Arab countries that affect their take up of ICT (Al-Gahtani 2003; Rose and Straub 1998).

In studies of IS development and implementation, authors following the transfer and diffusion approach endeavour to show the relevance of general IS research knowledge and good practice models (methods, analytical approaches, or theories) in particular developing countries or regions and to work out adaptations appropriate for them. A stream of publications present studies seeking to transfer and adapt systems development methodologies to accommodate analyses of the socio-organizational conditions of developing countries (Bell and Wood-Harper 1990; Korpela 1996; Korpela et al. 2000; Mursu et al. 2003). Similar method adaptation efforts have addressed the implementation of ERP technologies and IS-driven organizational change (He 2004; Jarvenpaa and Leidner 1998). Such studies enrich IS implementation knowledge and professional practice by working out modifications to accommodate various local circumstances. They avoid an a-contextual universalist 'best practice' view and adopt a notion of 'appropriate', context-specific practice (Avgerou and Land 1992; Bada 2002). They challenge the feasibility of

‘transferring’ generic technical know-how into developing countries organizations with the expectation of the same organizational practices and outcomes as in their context of origin (Avgerou 1996). Yet, they retain the general assumptions on the validity of purpose of the attempted innovation, for example to improve efficiency or competitiveness, as well as the validity of the underlying rationality of the transferred methods in their new context of practice.

### ***Social embeddedness***

The *social embeddedness* perspective takes the view that the development and use of ICT artefacts in developing countries concerns the construction of new techno-organizational arrangements in the local context of a developing country. It focuses attention on the embeddedness of ICT innovation in the social context of various organizational settings. The socially embedded innovation research approach finds the assumption of the transfer and diffusion perspective about the nature of information systems oversimplifying and misleading. It has developed more elaborate ontologies of IS innovation as socially constructed entities. The focal point of such research is the process of innovation *in situ*. It traces the cognitive, emotional, and political capacities that individuals nurtured in their local social institutions bring to bear on the unfolding of innovation efforts. Through this approach the socially embedded innovation discourse sheds light on what is locally meaningful, desirable, or controversial, and therefore how technology innovation and organizational change emerge (or are retarded) amidst the local social dynamics.

Studies of IS implementation that follow the social embeddedness approach see the purpose of ICT innovation as arising from local problematizations and its course as being shaped by the way local actors make sense of it and accommodate it in their lives (Avgerou 2002). They are theoretically grounded in social theory, such as Actor Network Theory, structuration theory, organizational institutionalism, which provides insights and vocabularies to address conceptual relationships such as technology/society, agency/structure, technical reasoning/institutional dynamics. The main objective of such studies has been the development of theoretical capacity for addressing questions concerning the way specific categories of technologies and social actors clusters are formed, shape each other, and lead to particular socio-economic outcomes.

IS in developing countries studies that follow the social embeddedness approach tend to broaden the research perspective beyond the particular circumstances of work within an organization. Early efforts to account for ICT innovation in relation to its context built on Pettigrew’s contextualist theory, which views particular instances of organizational interventions as processes unfolding through time in relation to layers of context: typically, the organizational setting and its national environment (Pettigrew 1985; Walsham 1993). Madon, for example, followed Pettigrew’s contextualist analysis to study the introduction of computers for the management of a rural development programme in India’s state district administration. Her analysis encompassed work norms within the district bureaucracies as well as cultural aspects of the Indian rural setting within which the rural development initiative and its administration were embedded (Madon 1993). While Pettigrew’s contextualist approach continues to be followed in IS in developing countries studies (Braa et al. 2007a), several other theoretical approaches have been introduced to explore ICT innovation in the developing countries’ context, including neo-institutionalist and social constructionist analyses (Avgerou 2001; Miscione 2007; Silva 2007).

An example of the socially embedded view of IS innovation is the extensive action research programme aiming to contribute to the development and implementation of healthcare information systems (HISP) in African, Asian, and Latin American countries

(Braa et al. 2007a; Braa et al. 2004). Authors analysing the HISP efforts have used a variety of complementary socio-theoretical approaches – structuration, ANT, Castells networks of action model, complexity theory. Rather than developing a best practice or contingency model for the healthcare context of developing countries, they have aimed to develop a conceptual analytical capacity to guide context-specific sense making and practice in countries with different health care systems and practices. They have followed this approach to study a range of issues, including standards that are sensitive to the local context (Braa et al. 2007a), and multiple country collaboration across north (technologically and economically advanced) and south (developing) regions (Braa et al. 2007b).

### ***Transfer and diffusion and social embeddedness perspectives in research on IS and culture***

One of issues that is frequently discussed in ICTD studies is the role of culture in ICT innovation. The transfer and diffusion approach frames the relationship of ICT and culture in terms of transferring ICT applications into a non-western national culture, which, more often than not, is seen as posing obstacles to innovation and as being a source of resistance (Straub et al. 2001). Hofstede's model of national culture variables and cultural difference (Hofstede 1984) is frequently used to analyse conflicts between values embedded into and behaviours required by ICT and the national culture of developing countries (Leidner and Kayworth 2006).

Such studies have been criticised as oversimplifying cultural difference, see for example (Myers and Tan 2002); they 'sweep the subtleties of cultural difference under the universal carpet', as Walsham put it in his extensive discussion of examples of IS innovation and culture research in developing countries (Walsham 2001). In contrast, research taking the socially embedded and transformative perspective has highlighted distinctive features of historically formed collective behaviour that require attention when designing appropriate ICT systems, or when organizing the innovation process, such as attitude to hierarchy, arranging action in time, sense of space and geography (Rohitratana 2000; Sahay 1998; Zakaria et al. 2003). Such research has also drawn attention to cross-cultural interactions. In effect, socially embedded studies avoid the juxtaposition of IS innovation (assumed to be inscribed with western culture) with DC culture (assumed to be bent to accommodate it) (Walsham 2002).

Particularly promising is the research that suggests a concept of culture which is dynamic and emergent, 'constantly being maintained and changing', an ongoing accomplishment (Westrup et al. 2003). Such research transcends the ICT/culture fit or conflict. Neither ICT nor culture are taken to be uni-dimensional determinants of values and behaviours. Information systems, seen as hybrid networks of artefacts, people, and institutions, are subject to negotiation and local shaping. Cultural influence, seen as a historically formed disposition for a particular behaviour, may stem from the innovating organization, its national or regional environment, or the social class of individual actors. And rather than focusing on IS innovation as fitting in or conflicting with the culture of its social context, of particular interest is the mutual re-constitution of IS innovation and the cultures that influence it.

### **The question of development in ICTD research**

ICTD research is based on the belief that ICT has, potentially, the capacity to contribute towards the improvement of various aspects of life, from alleviating poverty to

strengthening the democratic polity. But not all IS research in developing countries engages explicitly with questions of ‘development’ as action to transform the socio-economic conditions. In this paper I am interested in the research that concerns developing countries and is conscious of development as a purposeful and contested endeavour. Therefore, I examine that part of the literature that goes beyond a declaration of an assumption that ICT may serve good causes – e.g. the elimination of poverty – and at least implicitly takes a position regarding the socio-economic transformation process through which ICT will deliver its potential benefit.

Such transformative ICTD research often focuses on specific developmental aims, such as enhancement of livelihoods in rural areas (Duncombe and Heeks 2002), or improved government services (Krishna and Walsham 2005), and seeks to understand the effort required for ICT development and concomitant organizational change to take place successfully and to deliver expected benefits. Sometimes, though, ICTD research, confronted with the complex and highly political challenges of development endeavours, takes a critical stance to the role of ICT and development. I distinguish two perspectives of ICT-enabled development. The *progressive* perspective considers ICT as an enabler of transformations in multiple domains of human activities. ICT enabled developmental transformations are assumed to be achieved within the existing international and local social order. The *disruptive* perspective is premised on the highly political and controversial nature of development, both as a concept and as an area of policy for international and local action. It reveals conflicts of interest and struggles of power as a necessary part of ICT innovation in developing countries.

### ***Progressive transformation***

The progressive transformation perspective in ICTD research reflects a widespread understanding of ICT as an instrument for economic and social gains that has been promoted since the mid 1990s by major international development agencies, including the World Bank (World Bank 1999), the United Nations Development Programme (United Nations Development Programme 2001), the World Economic Forum (Dutta and Mia 2009). UNDP’s 2001 Human Development Report (United Nations Development Programme 2001, p. 29) is a good example of the association international organizations make between ICT and development, not least because this series of UNDP reports takes a broad view of development as a change of socio-economic conditions rather than economic growth. The 2001 UNDP report seeks to present a clear association between technology and desirable development effects, giving special attention to ICT – particularly the Internet. Indicatively, it quotes a World Bank study (Wang et al. 1999) which showed that ‘technical progress accounted for 40-50% of mortality reductions between 1960 and 1990 – making technology a more important source of gains than higher incomes or higher education levels among women’ (United Nations Development Programme 2001, p. 29). It asserts that, ‘(c)ross-country studies suggest that technological change accounts for a large portion of differences in growth rates’ (ibid.).

Central in this perspective is the view that ‘investment in ICT and effective use do matter for the economic development of a country’ (Mann 2004), p. 67. It is acknowledged that ICT needs to be accompanied by organizational restructuring to deliver productivity gains (Dedrick et al. 2003; Draca et al. 2007). Moreover, development requires effective government, and e-government is considered to be an important tool for achieving efficiency, transparency and responsiveness. International development agencies have emphasized also the potential of ICT to improve the performance of state organizations, the



delivery of health and education services, as well as democratic participation (United Nations Development Programme 2001).

Some ICTD research has sought to corroborate this thesis on the economic and social significance of ICT for development (Mbarika et al. 2007; Ngwenyama et al. 2006), addressing concerns of sceptics who doubt the appropriateness of ICT for poor countries and point out their pressing necessity to provide for the basic life needs of a large part of their population, to alleviate extreme poverty, and to fight endemic diseases and illiteracy. But on the whole ICTD research in the progressive transformation perspective tends to accept without testing the assumption that ICT potentially contributes to economic growth and to investigate the features of the ICT-based economy in particular countries or regions (Molla 2000) or the way ICT contributes to the competitiveness of organizations or regions (Goonatilake et al. 2000; Jarvenpaa and Leidner 1998; La Rovere 1996; La Rovere and Pereira 2000; Munkvold and Tundui 2005). Some research from the progressive transformation perspective has elaborated on the conditions under which ICT mediated business models and practices, which are considered necessary for participating in the global economy are diffused or the conditions under which IT-enabled niche industries are fostered (Davis et al. 2002).

The progressive transformation perspective is discernible also in research studying IS innovation in non-commercial organizations, such as in the development of national health data infrastructures (Braa et al. 2007a). The fundamental assumption is that IS innovation in existing institutions responsible for the provision of social services can empower them to improve their services and work conditions (Puri 2007). ICT enabled improvements can be achieved without challenging the political economy of a country's social welfare provision.

### ***Disruptive transformation***

The disruptive transformation perspective considers development, including ICT-enabled development, as a contested endeavour or as involving action with unequal effects on different categories of population, and thus is laden with conflict. Research taking this perspective often expresses doubts about the effectiveness and even the intentions of international or national policies regarding ICT and development. At the international level, analyses often manifest suspicion of the developmental intentions of the so-called Washington Consensus as well as the effectiveness of the policies for development that comply with the institutions that comprise it – World Bank, IMF, WTO. At the local level of the developing countries analysts often see the established social order as harbouring inequalities of wealth and power - for example in relation to castes, gender, or ethnic origin – and point out that ICT-enabled interventions have varying effects on categories of citizens. This approach tends to draw from heterodox economic ideas (Harvey and Garnett 2008) and critiques of globalization (Wade 2004b) and often applies critical socio-theoretical analyses (Kanungo 2003). In such studies, the researcher is not a neutral observer of the way IS innovation contributes to socio-economic transformations; s/he takes the side of a particular category of people (e.g. the poor, women, children of the world or of a particular developing region) who are weak and vulnerable in the socio-economic regimes of their milieu, and who are in risk to lose out (or at least not benefit) from ICT development initiatives.

Some research from the disruptive transformation perspective reveals hidden intentions and power dynamics which maintain or worsen current unevenness of wealth and opportunities for fulfilled lives among countries and categories of people. A good example of this is Ciborra's study of the computerization of driving licenses in Jordan (2005). In his analysis, Ciborra identifies an international socio-political significance attributed to e-government

interventions. Although the declared objectives of e-government projects, such as the computerization of the issuing of driving licenses, are improvements of efficiency of citizen services, Ciborra's study shows that such an innovation stumbles upon the complex network of state government controlling mechanisms. Indeed Ciborra, drawing from Heidegger's treatise on technology, points out the ordering character of information technology. The order sought in this case study, he argues, does not concern only the country of Jordan, but the world order at large. He traces the origin of the rationale of e-government in developing countries in the Washington Consensus and the security interests of the US government (Ciborra 2005), thus critically revealing a logic for promoting the use of ICTs in developing countries that originates in the interests of the world powerful rather than the concerns for development.

### ***Progressive vs disruptive transformation perspectives in research on telecentres***

The difference between these two perspectives is manifested in the research on telecentres, most of which acknowledges and discusses developmental aims. The rationale for the creation of telecentres is that countries or regions which do not have access to internet-based services are 'excluded' not only from global economic opportunities but also from modern society's information channels for education, health, and democratic participation. Poverty in many developing country areas, particularly the rural regions, prohibits the diffusion of ICT and telecommunication connectivity to any extent comparable to that of advanced economies. A solution appeared to be the development of community information services, often called telecentres, equipped with computers, internet connection, as well as fax machines. Many initiatives to introduce telecentres in poor rural communities in developing countries have been taken by international NGOs, such as the Canadian IDRC's Acacia<sup>5</sup> programme in Africa, or by country governments. Although their services vary, most of them run software applications of local interest, such as providing information on health, agricultural product prices, educational material or the issuing of government certificates.

Early research in the 1990s presented promising initiatives, highlighting the perceived potential of local empowerment through information and communication. Authors that heralded the developmental opportunities of telecentres gave examples of possibilities of overcoming extreme poverty or bureaucratic obstacles, of participating in public sector decisions and actions, and of overcoming corruption (Bailur 2007). Later, research indicated a more nuanced picture of the developmental contribution of telecentres, which includes some impressive cases of economic gain and social empowerment, but widespread failure and closure of telecentres, and increasing frustration among key actors such as the entrepreneurs who owned them, users/customers, and donors (Bailur 2007; Beilur 2007; Best and Kumar 2008; Madon et al. 2007; Parkinson and Lauzon 2008). Of interest to the discussion in this paper is the researchers' assumptions about the way telecentres are expected to contribute their developmental promise.

Much of the research on telecentres assumes that they are introduced in the existing socio-economic structures and practices of disadvantaged communities and can have a positive impact on lessening the gap between them and the advanced industrialised societies. A common expectation in the telecentres initiatives by many NGOs and governments, even in very poor communities, has been that, after investing some seed money, telecentres would

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<sup>5</sup> For information about IDRC's telecentre initiative, see <http://www.idrc.ca/acacia/index.html>. Other initiatives for the creation of community telecentres by international development organizations include ITU's (<http://www.itu.int/ITU-D/index.html>); UNESCO's (<http://www.unesco.org/websowlr/iip/#funding>) and the World Bank's ([http://worldbank.org/html/fpd/telecoms/subtelecom/selected\\_projects.htm](http://worldbank.org/html/fpd/telecoms/subtelecom/selected_projects.htm)).

form viable enterprises, able to cover the costs of their operations and to sustain a profitable business for local entrepreneurs (Harris et al. 2003). Consequently, research on telecentres attempts to fit and adapt the economic rationality of profitable business, even though, as research shows, there is not much potential for profit making from telecentre ‘customers’ who live in extreme poverty and most of whom have little appreciation of the benefits they may gain from using ICT services (Madon et al. 2007).

Some research which attempted to explain why so often telecentres prove unsustainable leans towards a disruptive transformation perspective and raises fundamental questions about the effectiveness of recommended mechanisms for development, such as public/private partnership mechanism of governance for development (Madon 2005). Madon’s review of telecentre initiatives as part of e-governance projects in India (2009) found, indeed, a tendency for ‘kiosks to be owned and staffed by private entrepreneurs’. Madon argues that, contrary to initial objectives to assist in the socio-economic development of the rural poorest of the poor, financial sustainability concerns led some telecentres to develop services of interest to more prosperous villagers, and points out that her review did not find evidence of any direct linking of the telecentres improving the living conditions of the communities they were intended to assist. Madon sheds doubts on the prudence of commercial and technological bias in current policy regarding rural poverty alleviation and, in effect, she questions the feasibility of the general techno-economic principles of the dominant development perspective of major international development agencies to serve poverty alleviation purposes.

Another example that suggests a disruptive transformation position is Kanungo’s (2003) analysis of the sustainability of an initiative that used ICT to create ‘knowledge centers’ in Indian villages and placed emphasis on the value of these centres ‘in terms of a better informed and liberated society’. In a positive attitude, Kanungo’s Habermasian approach reveals a disruptive mechanisms enabled by ICT that may form a basis for empowerment for the rural poor.

#### **Four discourses on IS innovation and development**

The combination of the two perspectives regarding the nature of the ICT innovation process and the nature of the development transformation process give rise to distinctive discourses about ICT and development, see Figure 1. I don’t mean that ICTD publications can be classified unambiguously on the four squares of a matrix. Indeed, some of the examples I draw from the ICTD literature could be positioned elsewhere on the plane of the matrix if a discussant chose to focus on some line of the authors’ argument other than the one I chose to bring to the readers’ attention. My aim is not to classify existing research in rigid categories, but to show the streams of argumentation about ICT and development that result from taking – most often in an unacknowledged way – the particular views about ICT innovation and about development that I discuss in this article.

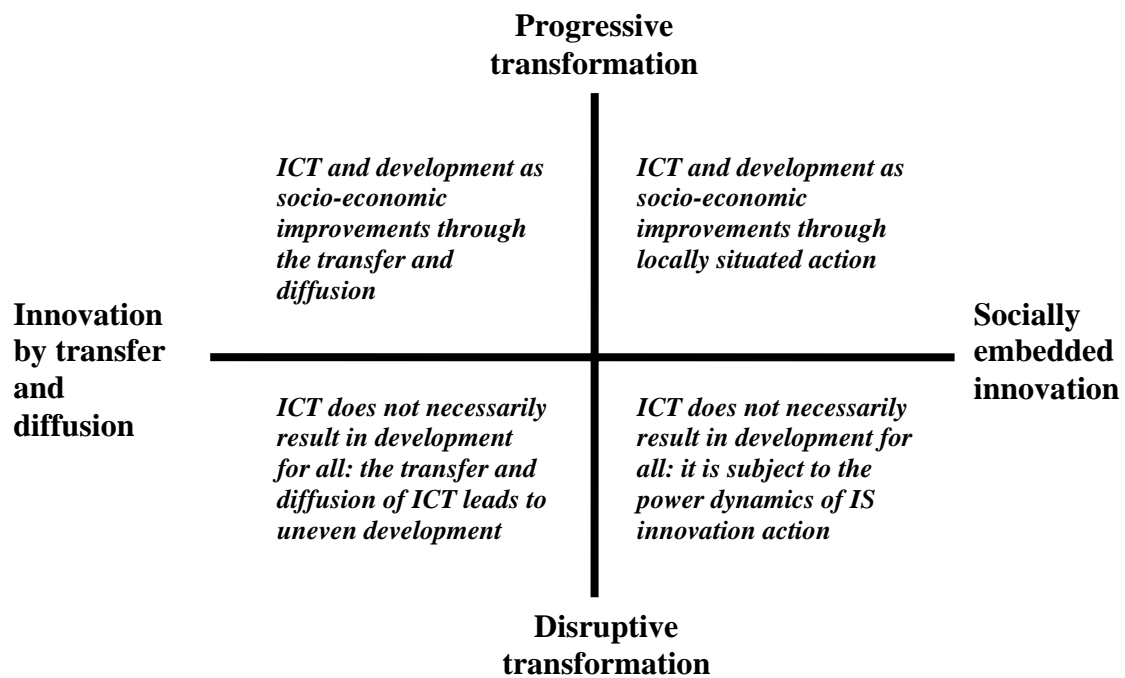


Figure 1.

I find it easier to distinguish between the transfer and diffusion from the social embeddedness perspective and more difficult to determine authors' perspectives regarding development. This is because ICTD research rarely adequately defines and discusses development perspectives and rarely draws from socio-economic development theory in its analysis. Moreover, quite frequently authors mix progressive transformation and disruptive transformation perspectives. For example, they may adopt the progressive transformation view of ICT and development at the global context by grounding their analysis on publications of indicator tables and policies of international agencies that follow neo-classical economic reasoning, and they may include a disruptive transformation view in their arguments that challenge existing power orders in domestic efforts of harnessing ICT (Brown and Brown 2009). Differences of perspective on the development process at different levels of context may indicate either complementarities or inconsistencies in the argumentation of an author. A point I wish to make in this paper is that ICTD research can improve its contributions if authors extend the theoretical grounding of their research to draw from ongoing debates on development theory and policy.

*ICT and development as socio-economic improvements through the transfer and diffusion of ICT and required institutions.* This discourse is formed by intertwining the transfer and diffusion perspective of IS innovation with the progressive transformation perspective of development. It tends to take the form of techno-economic argumentation, presenting the adoption of ICT-based practices pioneered in advanced economies as a necessity for improving life conditions in developing countries. A great deal of emphasis is given to efficiency gains resulting from ICT. The discourse often uses the 'catch up' metaphor: developing countries should adopt the technologies and institutions through which developed countries are understood to have achieved prosperity and improvements

in health, education, political participation to close the gap that separates them. It is recognised that existing institutional conditions in most developing countries are not adequate to support such a vision, and therefore, the argument goes, adaptation is needed (Bada 2002; Struab et al. 2001). One size of ICT and organizational models does not fit all, but the same techno-organizational logic of efficiency and competitiveness are thought needs to be adopted by all, and local organizations should be bent to achieve them.

***ICT and development as socio-economic improvements through locally situated action.***

This discourse is formed by combining the social embeddedness perspective of ICT innovation and organizational change with the progressive transformation perspective of development. It assumes the capacity of ICT to contribute towards improving life conditions, but sees the form and processes of improvements as primarily locally worked out in accordance to historically shaped meanings and power relations. Its core argument is that socio-economic change should make sense to the local people, so that they feel comfortable with the processes of change. There may be obstacles in the harnessing of the developmental potential, stemming from historically developed social orders, such as over-centralised public administration and authoritarian hierarchies, but the belief expressed in this discourse is that these can be addressed with empowering democratic ICT policies and appropriate professional practices, such as user participation (Braa et al. 2004; Puri 2007; Sahay and Walsham 2005). This discourse acknowledges influences from global actors. It is cautious about, but not confrontational with prevailing development ideologies and policies of international organizations. It often has a pragmatic character: technologies and methods transferred from technologically advanced societies do not work. Local improvisations are necessary to close the gap between theory and actual developing countries conditions. An example is Heeks' paper which suggests improvisations in systems development to avoid failure seen as caused by the inappropriateness of general IS design methods (Heeks 2002).

***ICT does not necessarily result in development for all: the transfer and diffusion of ICT leads to uneven development.***

This discourse combines the transfer and diffusion perspective of ICT innovation with the disruptive transformation perspective of development. Its argumentation accepts the logic of ICT as a force for socio-economic change, but finds that it entails risks of reinforcing domination and inequality. Thus, it uncovers distorting effects of ICT and institutional transfer and diffusion and reveals interests in preserving historically formed privileges (Ciborra 2005; Wade 2004a). It challenges the evidence on the generally seen as beneficial effects of development policies such as globalization, liberalization, ICT and productivity gains, and sometimes doubts the motives of powerful actors, such as the international development agencies, national policy makers, and corporate managers.

***ICT does not necessarily result in development for all: it is subject to the power dynamics of IS innovation action.***

This discourse intertwines the social embeddedness perspective of ICT and organizational change with the disruptive transformation perspective of development. It is a critical discourse in the sociological sense of critical theory, and is concerned with particular biases of power and inequalities in specific socio-economic conditions of a country or a community. The starting position is the local context, with its historically formed patterns of privileges, and may extend its analysis to the biased influences exerted from the power-laden inscriptions carried by particular technologies or institutional reform models and policies. For example, in a study of the potential use of ICT by Egyptian craftswomen, Hassanin points out various structural challenges that inhibit their capacity to trade in global markets (Hassanin 2008). In effect, the socially embedded and disruptive discourse deconstructs the dominant view about ICT and development,

juxtaposing it to the local interests, imaginaries, and realization potential of a better life. Its critiques question not only the effectiveness of ICT and development to lead to life improvements, but also the desirability of their projected visions (Stahl 2008; Thompson 2004).

### *The four discourses in ICTD research on the software industry*

A prominent stream of ICTD literature concerns the software industries that have emerged in a number of developing countries and achieved the ability to compete in the global market, thus forming a substantial part of the ‘global outsourcing’ or ‘offshore outsourcing’ phenomenon (Carmel and Agarwal 2002). India is the most successful country in this business, and the efforts of its software firms have been studied within the ICTD subfield since its early days nearly 20 years ago (Heeks 1990; Nicholson and Sahay 2004; Sahay et al. 2003).

Most research on developing countries’ software industries view ICT and development as a matter of socio-economic improvements through the transfer and diffusion of ICT capabilities and required institutions. They tend to see the developmental potential of these industries in their capability to compete in global markets and thus to export services and products. Their achievement lies in being able to master software production techniques and business models that allow them to compete globally. Many such studies examined the factors that account for software industry success within the global market of services and products of IS innovation (Adelakum 2005; Carmel 2003a). Success factors include technology and project management skills, labour costs, telecommunications infrastructures, English language skills, copyright legislation, and government industrial policy. There are also ongoing studies that assess and compare the relative advantages among developing countries competing for the lucrative markets of industrialized countries (Carmel 2003c). For example, while India is so far considered the most successful DC software exporter, concern is raised that competition from China on the basis of lower salaries may erode its advantage in some important markets, such as Japan.

Some research has focused on the micro-societal processes that constitute the practices of global outsourcing services, highlighted the difficulties of cross-cultural collaboration and the surfacing of multiple political conflicts (Barrett and Walsham 1995; Nicholson and Sahay 2001) and emphasized the intrinsically tacit nature of the knowledge of software developers (Nicholson and Sahay 2004; Sahay et al. 2003). For example, Nicholson and Sahay’s study of the policy efforts of the Costa Rican government to promote an export oriented industry highlighted the implications of historically formed vested interests in the country, power structures and attitudes towards development (Nicholson and Sahay 2007). Nevertheless the discourse of such research does not challenge an implicit progressive transformation view of ICT as an enabler of economic development by participating competitively in the global free market.

Both these discourses – stemming from the transfer of skills and the socially embedded practice perspectives - on the software industry in developing countries tend to focus on achieving capacity for export of software products and services, taking such exports to be an important source of income and of national prestige. Some comparative analyses of the software industries of major developing countries suggest that there may be trade-offs between efforts to foster an export oriented software industry and IS innovation in domestic organizations (Carmel 2003b; Commander 2005). For example, although successful in exporting software products and services, until about 2006 India’s software industry was much less successful in contributing to domestic organizations’ IS innovation. The ‘trickle down’ effect has been too slow to make a difference for the rest of the economy.

Some research from the transfer and diffusion and disruptive transformation perspectives engages in a critical discourse about the developmental role of the developing countries' software industry. D'Costa (2002) discussed the Indian software sector as a case of 'uneven and combined development', that is, as coexisting with stagnating sectors, such as heavy industry, and giving rise to tensions that stem from competing modes of production, inequality, and differential growth rates among different regions. D'Costa's argumentation challenges the dominant view of international NGOs about market-led policies for economic development and suggests state action for assisting the development of other sectors in order to minimise the socio-economic problems of uneven development.

Madon and Sahay (2002) focused on changes in the social fabric of the city of Bangalore that were caused by its booming software industry, and formed arguments from the social embeddedness and disruptive transformation perspectives. They pointed out that the city has not attracted only affluent professionals but also the very poor, seeking work at the margins of the official economy and living in slums at the borders of the city.

## **Conclusions**

ICTD research has produced a substantial body of knowledge on the efforts made in developing countries to exploit the potential of the never ending advances of ICT. My review suggests that our research in this area faces two immediate theoretical challenges. The first is related with the recognition of the significance of contextual contingency that both the diffusion and the social embeddedness ICTD discourses share. ICTD studies need to develop theory capable of addressing the interrelationship of ICT innovation with its cognitive and socio-political context. Established categories such as nations, industries, and formal organizations that are taken as 'context' in most ICTD research, may not, on their own, provide appropriate framing for understanding the ideas and actions that constitute incidents of ICT innovation. Assumptions of stereotypical behaviour associated with 'local culture' are unlikely to explain adequately encounters with new technologies and interactions among the multiple actors that are involved in ICT projects and their consequences. Theory is needed to identify what is relevant context for each case of ICT innovation, and how it matters.

The social embeddedness perspective is in a better position than the transfer and development perspective to do so. Its institutionalist epistemology (Berger and Luckmann 1967) is fundamentally contextualist. It brings into research attention issues related with meaning - meaning of the developmental capacity of ICT within the context of an innovation effort - and associates people's actions with the frameworks of interpretation sustained by the cultures of their context. As it has been developed in close association with contemporary social theory, the social embeddedness perspective and its socio-technical concepts address more effectively the dynamic interplay between the artefacts/cognitive constructs of innovation and the multiple and changing social dimensions in developing countries. Yet, studies that follow concepts and theories from the socially embedded perspective have not so far produced a coherent theoretical basis to guide contextualist research in developing countries. More systematic theorizing efforts are needed to understand how the socio-economic context enables or constrains meanings and actions of ICT innovation that contributes life improvements in developing countries, and to test the explanatory capacity of such theory.

The second theoretical challenge is the strengthening of the field's capacity to associate ICT innovation with socio-economic development (Heeks 2006; Thompson 2008). ICTD

studies that concern the role of ICT in the struggle for the transformation of the life conditions of the billions of poor – with implications for the lives of the affluent – inevitably implicate political ideologies of development (such as the ‘Washington consensus’ or ‘basic needs’ views ), as well as policies and actions of development institutions (such as the World Bank, the aid agencies of ‘Western’ countries, international NGOs). Analyses of the ICT innovation context include controversial government policies, such as liberalization of telecommunications for extending connectivity, or the filtering of internet information by national governments. Without diligent grounding on theory regarding development processes, studies of the developmental potential of ICT lack analytical bearings and rely on common sense or popular assumptions of what are desirable developmental effects and how they can be achieved. Critical discourses on ICT and development run the risk of having a polemic or moralizing character, unworthy of scholarly attention and unconvincing in policy circles. ICTD research has a great deal to gain from engaging with current theoretical and policy debates on development in economics and the social sciences, in a similar way that IS research gained strength in its argumentation about the nature of IS innovation from studying theories of technology in sociology.

We should work towards developing a theoretical basis for the analysis of the political economy and the sociology of ICT-enabled development. We need studies of the political actors and institutions through which economic models and technological potential are translated into industries, information infrastructures, and ‘empowered’ societies. We need to engage with the ongoing scholarly debates on the articulation of local political economies with global political and economic trends.

One further challenge is to bring together these two types of theory: on contextualist ICT innovation and on ICT-enabled development. This is not an easy task. For example, the contextualist socially embedded theory that I advocated above has been a powerful analytical device for micro-level processes, while the political economy of development deals mostly with macro-level processes involving aggregates of individuals’ actions, collective actors, and institutions. Research that spans micro-macro analytical domains of the social sciences is notoriously difficult.

Empirical research plays a major role in addressing theoretical challenges. In this respect, ICTD is becoming an increasingly richer research domain. Quantitative data on ICT and development may not be as abundant in developing countries as in industrialized countries, but with concerted efforts by international development agencies tracking poverty alleviation, economic growth, and various human development indicators, quantitative ICTD studies that set out to reveal patterns and correlations become feasible. Qualitative researchers have ample opportunities for insightful ICTD research. There is scarcely any region or community that does not have interesting experiences with ICT innovation. Initiatives to promote ICTs are widespread and have now a history of adequate length to reveal the influences from various institutions and the effectiveness of various policies, as well as the formation of meanings and capacities for action. Unpredicted success cases, such as the emergence of the globally competitive software industry in India or the phenomenal diffusion and innovative uses of mobile phones in Africa are particularly important for building theoretical underpinnings for the ramifications and complexities of ICT and development.

Perhaps the primary motivation of ICTD researchers is their appreciation of the potential of ICT innovation to contribute to the improvement of human condition. But we are also the first to witness in our research the falsity of widely held technology deterministic



expectations that ICT, by virtue of its technical properties, will have this or that development effect. Our task is to understand what it takes for ICT to contribute to improving the life conditions of the people who need such improvement the most, and it is this end that the theoretical efforts I suggest in concluding my review of the field is intended to serve.

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