

KNOWLEDGE NETWORKS FOR DEVELOPMENT: A PARTICIPATORY DESIGN APPROACH

Charlotte Scarf¹ and Kelly Hutchinson²

Abstract — International development organisations such as the United Nations Development Programme (UNDP) and the World Bank are actively promoting the development of knowledge networks as a cornerstone of their approach to knowledge sharing for development. At the same time critics are concerned that the approach excludes the majority of people in developing countries and adversely affects the diversity of knowledge needed for sustainable development. This paper provides a reflective analysis of the current framework and critically examines the potential for qualitatively superior strategies to emerge through the use of participatory design. It contributes to the debate by offering a conceptual framework for the participatory design of knowledge networks that place a premium on accessible information and communications systems and local knowledge to facilitate knowledge sharing between organisations from developed and developing countries.

Index Terms — information and communication systems, international development, knowledge networks, participatory design.

INTRODUCTION

The complexities of development have generated vast bodies of literature, along with numerous interest groups and continuous calls for change. The conventional development paradigm, which was based on the premise that poor countries can be propelled along a development path by knowledge (and capital) emanating from the rich, has been replaced by a new emphasis on the need for more balanced relationships between aid donors and recipients and the importance of local knowledge for development. The new wisdom gives priority to partnerships and emphasises participation, not just by government agencies but also by nongovernmental organizations, and other parts of civil society as the best way to achieve sustainable development.

This shift in development discourse towards a more participatory approach has occurred in conjunction with the emergence of information and communication technologies (ICTs), which have created new possibilities for people to engage with each other “virtually” and share knowledge on a global scale. In the development context, the emergence of ICTs has given rise to a proliferation of “knowledge networks”, which are seen by many to capture the essence of

the new development wisdom in practice, encompassing participants whose engagement transcends traditional distinctions, bypassing the constraints of asymmetry and knowledge transfer associated with the conventional paradigm (Fakuda-Parr et al. 2002).

Creech and Willard (2001, pp10-24) point out that the term “knowledge network” is often used as a blanket description for a variety of internet-based collaboration models, including strategic alliances, communities of practice, information networks and networks of experts. They distinguish “formal knowledge networks” from other models based on their strategic intention, structure, and level of formality, identifying the former as a more structured and outcome-oriented approach. “A formal knowledge network is a group of expert institutions working together on a common concern to strengthen each other’s research and communications capacity, to share knowledge bases and develop solutions that meet the needs of target decision-makers at the national and international level” (Creech & Willard 2001, p19).

International development organisations such as the United Nations Development Programme (UNDP) and the World Bank are actively promoting the development of knowledge networks as a cornerstone of the new approach to sharing knowledge to support development. At the same time, some development theorists and practitioners are concerned that the approach may fall into the same problems experienced with the conventional development paradigm and adversely affect the ability of people from developing countries to participate and contribute the local knowledge needed for development.

This paper contributes to the debate by providing a reflective analysis of the current framework and critically examining the potential for qualitatively superior strategies to emerge through the use of participatory design. It offers a conceptual framework for the participatory design of knowledge networks that place a premium on accessible information and communication systems and local knowledge to facilitate knowledge sharing for development between organisations from developed and developing countries.

CLOSING THE ‘DESIGN-REALITY GAP’

For organisations to learn from each other and build on each other’s strengths, knowledge networks require a

¹ Charlotte Scarf, RMIT University, Melbourne Australia, charlotte.scarf@rmit.edu.au

² Kelly Hutchinson, RMIT University, Melbourne Australia, kelly.hutchinson@rmit.edu.au

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communication infrastructure to support information sharing, collaboration, and communication between network members (Creech & Willard 2000). The communication infrastructure in most knowledge networks typically consists of a variety of real and virtual spaces. In-country workshops form the basis of the former, while Internet-based ICTs, such as email, extranets, websites, and collaborative groupware tools, are particularly important for the latter (ibid). However, there are a number of factors that affect the ability of organisations, particularly in developing countries, to access and use these technologies. Yet the frameworks that guide knowledge networks tend to assume a homogenous environment and thus exclude this in their design.

According to Heeks (2002), the design conceptions that inform the development of information systems derive largely from the assumptions of the stakeholders who dominate the process. In the case of knowledge networks, it is the assumptions of international donors and global IT managers that tend to drive information and communication systems design. According to Heeks (2002), those stakeholders are often drawn from western and/or rational-technical contexts and bring with them the “If it works for us, it’ll work for you” mentality. They also bring their context with them and then impose designs derived from that context which tend to mismatch the realities of organisations in developing countries. He calls this phenomenon the “design reality gap.”

There are considerable differences in ICT infrastructures globally between countries e.g. between developed and developing countries, as illustrated in Table I (Millennium Development Indicators 2003). The infrastructural capability of a country is likely to influence the kind of technology organisations can deploy (Okunoye 2003). To avoid excluding organisations in developing countries, knowledge networks therefore need to pay attention to the ICT infrastructure that exists within the countries of its members and take cognisance of multiple media, including offline options, in the process of design (Kling & Star 1998).

TABLE I

INFRASTRUCTURE DIFFERENCES

Statistics	Telephone Lines & Mobile Subscribers	Personal Computers	Internet Users
Bangladesh	1.32	0.34	0.15
Cambodia	1.91	0.15	0.22
Japan	117.36	38.25	44.93
Malawi	1.52	0.13	0.26
US	114.70	62.50	53.75

*Per 100 population

Differences in ICT infrastructures may also determine the sustainability of Internet-based communication between countries. Access to the Internet is not always guaranteed in

organisations within developing countries even where it is physically possible (Song 1999). Service stability and access speeds vary from country to country. Moreover, the IT expertise necessary to support technology differs between countries (Kling and Star 1998; Okunoye 2003). Heeks (2002) also lists the local skill base as an important variable, which may affect members’ ability to use ICTs. This would suggest that designers of knowledge network information and communication systems should consider the stability of the ICT infrastructure, Internet access speeds, availability of technical support personnel, and the skill base within member countries.

Other factors may also impact on the ability of network members from different countries to access and use ICTs. Vohringer-Kuhnt (2002) suggests that culture is a discerning variable in the technology acceptance process. He argues that any system that ignores users’ cultural background is likely to fail. Korpela (1996) argues that wider socio-economic factors are more important determinants of IT systems’ failure or success. Okunoye (2003) synthesises both views by suggesting that both cultural and socio-economic factors are important considerations. He lists governmental, economic, political, social, educational, infrastructural, and cultural factors as ‘environmental factors’ that may affect organisations’ ability to access and use IT systems, but are outside of their control. Clearly, approaches that take these factors into account are essential when designing information and communication systems that match the reality of network members, particularly those in developing countries.

The critical role of organisational factors in determining the success or failure of IT systems is well documented. For example Matson et al (2003) and Holsapple and Joshi (2000) have noted the variables that may affect knowledge management systems within organisations. Heeks (2002) adds to the conventional understanding of organisational factors by suggesting that they are “not just a question of relatively objective realities, such as work processes or organisational structures, but also of relatively subjective realities, including perceptions and values.” This would suggest that a design approach is needed that takes both objective and subjective realities into account when developing information and communication systems for knowledge networks that encompass organisational participants.

Heeks (2002) has developed a framework outlining the factors which he considers most significant in determining the success or failure of information systems in developing countries. His framework has been adapted to encompass all the factors outlined in this discussion of knowledge network information and communication systems design and is presented in Diagram 1. To reduce the gap between the design of knowledge network communication infrastructures and the realities of network members, particularly those in developing countries, designers need to analyse members’ realities and match information and communication systems

with regards to all of the factors outlined. A design approach for closing the design-reality gap in this way will be discussed in the final section of this paper.

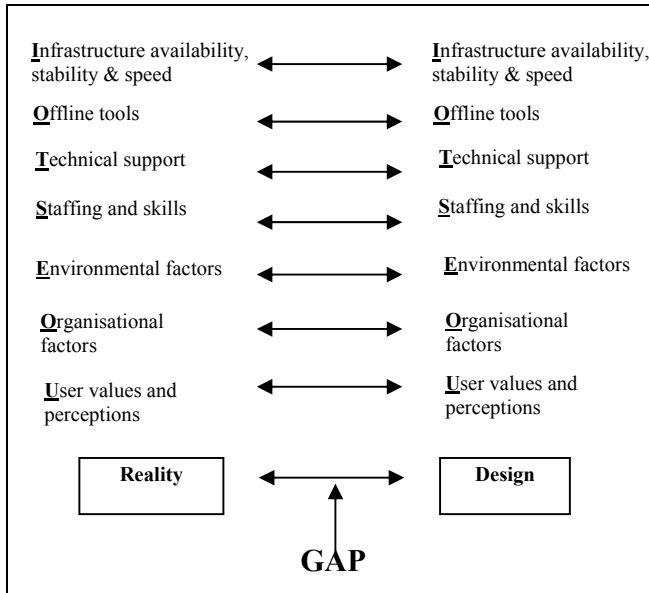


FIGURE 1

“THE DESIGN-REALITY GAP” (ADAPTED FROM HEEKS 2002)

ADDRESSING ASYMMETRY IN THE KNOWLEDGE FRAMEWORK

Organisations ostensibly create knowledge networks to learn from each other and build on each other’s strengths (Creech & Willard 2000). However, most are initiated through the efforts of one or two lead organisations, usually based in the West. Fakuda-Parr et al (2002) and Stiglitz (1999) argue that such capacity building efforts are often based on ingrained notions of Western organisational concepts and processes and may undermine incentives for organisations in developing countries to develop their own capacities. The most successful knowledge networks are designed to encourage the autonomy of members, instead of attempting to impose procedures that attempt to modify or constrain their behaviour (Malholtra 2001; O’Malley & O’Donoghue 2001). For this reason, it is essential that network members, particularly those in developing countries, have input into the design process and that it is not dominated by the lead organizations.

One of the greatest challenges in setting up and running knowledge networks is moving members beyond sharing information to actually working together on solutions (Creech & Willard 2000). Drew (2002) suggests that the root cause of this problem is the unequal power relations between Southern and Northern institutions which may lead to a one-way relationship of the North “teaching” the South – rather than facilitating the access and impact of Southern voices in policy processes. Critics of the knowledge

framework that underpins knowledge networks opine that it subjugates local knowledge to “western” forms of knowledge (Ballantyne 2002; Odera Hoppers 2002; Van Der Velden 2002). King (2001) and Van Der Velden (2002) suggest that knowledge networks need to escape from their present narrow framework and instead focus on cultivating the local knowledge needed for development by members in developing countries, and designers must find ways to support this.

Ballantyne (2002) suggests that in order to be an effective tool for development, knowledge networks need to provide opportunities for members in developing countries to interact and communicate with each other, expressing their own ideas, knowledge, and culture in their own languages. He also suggests that knowledge networks have a responsibility in requiring that local content efforts contribute to the global knowledge pool and that members, particularly those in developing countries, have a responsibility for translating, synthesising, and adapting global content to make it suitable for local use. To a large extent, this means that designers need methods that can assist them in developing information and communication systems that members can use to convey locally relevant messages and information. It also means that they need to design systems that enable members to process information from the field quickly and effectively (Madon, 2000).

According to Ballantyne (2002), while the potentials of ICTs to share and exchange local content are impressive, often the most useful technologies are tape recorders, radio, television, newspapers or telephones. He says that ICTs and the Internet are currently only a small part of the toolkit used to create and communicate local content, which is why very little can be found on the Internet. Most local content is simply invisible to international audiences that are ‘unconnected’ to local non-digital content channels. Where technologies permit, he suggests that ‘converging’ across media is desirable. Thus, a major challenge for knowledge networks is to find ways to incorporate the non-digital local content needed for development, using an innovative blend of technical solutions and alternative media. Clearly, network members in developing countries can play a major role in this effort, repackaging ‘global’ information for offline distribution, and facilitating the online communication of local information from the field, but this needs to be reflected in the information and communication systems’ design.

A PARTICIPATORY DESIGN APPROACH

Fakuda-Parr et al. (2002, p19) suggest that, to be an empowering tool for development, knowledge networks have to be “truly open, participatory and demand-driven.” O’Malley and O’Donoghue (2001) argue that empowerment is achieved by people developing their own solutions, rather than having them imposed or imported from the outside. According to Song (1999), without fundamental buy-in from

the participants, electronic networks are doomed to fail. From this, it would seem clear that network members, particularly those in developing countries, must be equal partners in the design process, and that their participation will lead to different strategies for sharing knowledge to support development. Participatory design is the suggested approach for achieving the strategies put forward in this paper.

Participatory Design does not prescribe the use of a particular method (Beekhuyzen et al 2003); it encompasses a rich diversity of theories, practices, analyses, and actions (Kuhn & Muller 1993) that put the knowledge, voices, and rights of users at the centre of the design process (Muller 1993). It is a human centred approach that differs from conventional design in terms of increased user involvement from the beginning of the design process. According to Kling and Star (1998), the goals of human centred design, are not fixed once and for all, and good for all contexts. Given that humans are so diverse, by nature human centred designing tends to be tailored, rather than mass-produced. Thus, there is no singular recipe for human centred design or, as a corollary of this, participatory design.

Fayard (1999) states that participatory design involves four types of actors: designers, human factors experts, managers, and users. He suggests that it is important to create a positive context for participatory design by supporting and enhancing communication between different actors, and by actively involving users from the beginning to the end. The objective is that the people who will eventually use the system are able to help define what they need the system to do (Kling & Star 1998). The 'product' of a participatory design process is developed through a series of iterations, with and alongside users. Insights and understandings emerge directly from the process, with users being seen as more than an important source of information on existing practices, but also as intelligent, creative and productive contributors (Muller 1993). They interpret possibilities in relevant manners according to their context, and envision using the system in new ways that have not been thought of by designers (Kling & Star 1998).

Trigg and Clement (2000) suggest that a deep level of understanding of the user and contexts of use are reflected in the products and outcomes of the participatory design process. There is a concern for the social, cultural, and political implications of the product of the design process in use. Consequently, the product of a participatory design process is more likely to empower users, particularly if those users have previously been disenfranchised. When applied to knowledge networks, participatory design approaches may empower network members to codetermine the development of new and more effective strategies for sharing knowledge to support development.

TABLE 2
CONTRASTING APPROACHES TO KNOWLEDGE NETWORK DESIGN

	Current Approach	Participatory Design Approach
Participants in design process	International donors; Lead organisation(s); Global IT team	Network members, including managers and users; Decentralised IT teams, including human factors experts
Resulting knowledge framework	Diffusion of knowledge from more developed to less developed countries	Legitimation and cultivation of a diversity of knowledge, particularly local knowledge
Resulting communication infrastructure	ICT-focused; Assumes a homogeneous environment	Broad mix of tools, including online and offline options; Assumes a diverse environment

CONCLUSION

The current approach to knowledge networks and associated information and communication systems' design fails to take the diverse realities of network members, particularly those in developing countries, into account. This paper demonstrated the result of this approach may be a mismatch between information and communication systems and the realities of network members, as well as the exclusion of the local knowledge needed for development. It has also shown that by making network members active participants in the design process, knowledge networks may be able to close the design-reality gap and address the asymmetrical knowledge framework that characterises the current approach. It may also result in radically different, but qualitatively superior strategies for sharing knowledge to support development.

However, in advocating a participatory design approach, the authors note that it defies prescriptive methods and techniques, which makes successful implementation a complex challenge. According to Heeks (1999), successful implementation is highly problematic where it "ignores or is ignored." By this, he means that any attempt at using a participatory approach must consider the context within which it seeks to take place and use genuinely participatory methods.

FURTHER RESEARCH

In a sector that works toward the overarching goal of poverty reduction, it is important to consider whether knowledge networks contribute to this goal, or whether they benefit the rich more than the poor. More research is needed to develop simple effective means for evaluating knowledge networks (Creech & Willard 2003). However, due to the diverse contexts in which network members operate, evaluation is also a complex challenge. To put it crudely, the best strategies in Canada are not necessarily the best strategies in Uganda. Moreover, different groups and organisations may have different associations to concepts such as 'leadership', 'cooperation', 'information', 'sharing', and 'monitoring'" (Hovland 2003). For this reason, successful evaluation may also benefit from a participatory approach.

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